COUNCILMEMBERS
Melissa Hernandez, Mayor
Michael McCorriston, Vice Mayor
Jean Josey, Councilmember
Dr. Sherry Hu, Councilmember
Kashef Qaadri, Councilmember

DUBLIN
CALIFORNIA

City Council Chamber
Dublin Civic Center
100 Civic Plaza
Dublin, CA 94568
www.dublin.ca.gov

# REVISED AGENDA

## Regular Meeting of the
# DUBLIN CITY COUNCIL

**Tuesday, January 10, 2023**

**Location: Council Chamber**
**100 Civic Plaza**
**Dublin, CA 94568**

**CLOSED SESSION 6:30 PM**
**REGULAR MEETING 7:00 PM**

Pursuant to AB 361, the City is authorized to hold public meetings via teleconferencing and to make public meetings accessible telephonically or otherwise electronically to all members of the public, without making available any physical location for the public.

Additional Meeting Procedures Available During the COVID-19 Pandemic

This City Council meeting will be broadcast live on Comcast T.V. channel 28 beginning at 7:00 p.m. This meeting will also be livestreamed at www.tv30.org and on the City's website at: https://dublin.ca.gov/ccmeetings

Members of the public who wish to participate in the meeting electronically have the option of giving public comment via Zoom, subject to the following procedures:

• Fill out an online speaker slip available at www.dublin.ca.gov. The speaker slip will be made available at 10:00 a.m. on Tuesday, January 10, 2023. Upon submission, you will receive Zoom link information from the City Clerk. Speakers slips will be accepted until the public comment period ends, or until the public comment period on non-agenda items is closed.

• Once connected to the Zoom platform using the Zoom link information from the City Clerk, the public speaker will be added to the Zoom webinar as an attendee and muted. The speaker will be able to observe the meeting from the Zoom platform.

• When the agenda item upon which the individual would like to comment is addressed, the City Clerk will announce the speaker in the meeting when it is their time to give public comment. The speaker will then be unmuted to give public comment via Zoom.

## CLOSED SESSION 6:30 PM

**I. CONFERENCE WITH REAL PROPERTY NEGOTIATORS**
Property: Portion of Assessor's Parcel No. 986-0028-003-00 adjacent to Tassajara Road
Agency Negotiator: Linda Smith, City Manager
Negotiating Parties: East Bay Regional Park District
Under Negotiation: Price and terms of payment

**II. CONFERENCE WITH REAL PROPERTY NEGOTIATORS**
Property: Portion of Assessor's Parcel No. 986-0028-002-00 adjacent to Tassajara Road
Agency Negotiator: Linda Smith, City Manager
Negotiating Parties: Javid Roshan/Zarmina Mayar
Under Negotiation: Price and terms of payment

**III. CONFERENCE WITH REAL PROPERTY NEGOTIATORS**
Property: Portion of Assessor's Parcel No. 986-0001-001-07 adjacent to Tassajara Road
Agency Negotiator: Linda Smith, City Manager
Negotiating Parties: United States of America
Under Negotiation: Price and terms of payment

**IV. CONFERENCE WITH REAL PROPERTY NEGOTIATORS**
Property: Portion of Assessor's Parcel No. 986-0003-001-02 adjacent to Tassajara Road
Agency Negotiator: Linda Smith, City Manager
Negotiating Parties: Kathy L. Betran
Under Negotiation: Price and terms of payment

## REGULAR MEETING 7:00 PM

**1. REPORT ON CLOSED SESSION**

**2. CALL TO ORDER AND PLEDGE OF ALLEGIANCE**

**3. ORAL COMMUNICATIONS**

**3.1 2022 Sponsor Recognition**
The City Council will recognize sponsors who contributed to City events, programs, and facilities in 2022.
**STAFF RECOMMENDATION:**
Recognize the 2022 sponsors.
Staff Report
Attachment 1 - 2022 City of Dublin Sponsorship List
Item 3.1 PowerPoint Presentation

**3.2 Recognition of Parks Reserve Forces Training Area 80th Anniversary**
The City Council will recognize Parks Reserve Forces Training Area's 80th Anniversary.
**STAFF RECOMMENDATION:**
Present Certificate of Recognition to Parks Reserve Forces Training Area.
Staff Report
Attachment 1 - Certificate of Recognition

### 3.3 Recognition of the 2022 "Deck the Homes" Holiday Home Decorating Contest Winners

The City Council will receive a presentation on the 2022 "Deck the Homes" Holiday Home Decorating Contest and present Certificates of Recognition to the winners.

**STAFF RECOMMENDATION:**

Present Certificates of Recognition to the 2022 "Deck the Homes" Holiday Home Decorating Contest winners.

Staff Report
Attachment 1 - 2022 Holiday Home Decorating Winners
Attachment 2 - 2022 Home Holiday Decorating Contest Flyer
Item 3.3 PowerPoint Presentation

### 3.4 Employee Introductions

New City of Dublin Staff members, Gabrielle Abdon, Associate Civil Engineer, with the Public Works Department, and Gary Gosal, Captain, with Dublin Police Services, will be introduced.

**STAFF RECOMMENDATION:**

Welcome the new City of Dublin Staff members.

Staff Report

### 3.5 Public Comment

At this time, the public is permitted to address the City Council on non-agendized items. Please step to the podium and clearly state your name for the record. COMMENTS SHOULD NOT EXCEED THREE (3) MINUTES. In accordance with State Law, no action or discussion may take place on any item not appearing on the posted agenda. The Council may respond to statements made or questions asked, or may request Staff to report back at a future meeting concerning the matter. Any member of the public may contact the City Clerk's Office related to the proper procedure to place an item on a future City Council agenda. The exceptions under which the City Council MAY discuss and/or take action on items not appearing on the agenda are contained in Government Code Section 54954.2(b)(1)(2)(3).

## 4. CONSENT CALENDAR

Consent Calendar items are typically non-controversial in nature and are considered for approval by the City Council with one single action. Members of the audience, Staff or the City Council who would like an item removed from the Consent Calendar for purposes of public input may request the Mayor to remove the item.

### 4.1 Approval of the December 20, 2022 Regular City Council Meeting Minutes

The City Council will consider approval of the minutes of the December 20, 2022 Regular City Council Meeting.

**STAFF RECOMMENDATION:**

Approve the minutes of the December 20, 2022 Regular City Council Meeting.

Staff Report
Attachment 1 - December 20, 2022 Regular City Council Meeting Minutes

### 4.2 Youth Mini-Grant Funding Recommendations Approval

The City Council will consider approving the Youth Advisory Committee Mini-Grant Program recommended funding allocations.

**STAFF RECOMMENDATION:**

Adopt the **Resolution** Approving Funding Recommendations for Fiscal Year 2022-23 for the Youth Advisory Committee Mini-Grant Program.

Staff Report
Attachment 1 - Resolution Approving Funding Recommendations for Fiscal Year 2022-23 Youth Advisory Committee Mini-Grant Program
Attachment 2 - YAC Mini-Grant Rating Form
Attachment 3 - Fiscal Year 2022-23 Mini-Grant Applications and Proposals

**4.3 Approval of Plans and Specifications and Award of Contract to St. Francis Electric., Inc. for the Citywide Signal Communications Upgrade - Conduit Installation for Future Fiber Interconnect on Dublin Boulevard Project, CIP No. ST0713**

The City Council will consider approving the plans and specifications and awarding a construction contract to St. Francis Electric for the Citywide Signal Communications Upgrade - Conduit Installation for Future Fiber Interconnect on Dublin Boulevard Project, CIP No. ST0713. The project will install a three-inch conduit on Dublin Boulevard between the Civic Center and San Ramon Road. This project is exempt under Section 15302 (Replacement and Reconstruction) of the CEQA Guidelines.

**STAFF RECOMMENDATION:**

Adopt the **Resolution** Approving the Plans and Specifications and Awarding a Contract to St. Francis Electric for the Citywide Signal Communications Upgrade - Conduit Installation for Future Fiber Interconnect on Dublin Boulevard Project, CIP No. ST0713.

Staff Report
Attachment 1 - Resolution Approving the Plans and Specifications and Awarding a Contract to St. Francis Electric for the Citywide Signal Communications Upgrade
Attachment 2 - CIP ST0713
Attachment 3 - Bid Results

**4.4 Agreement for Water Slide Maintenance Services at The Wave**

The City Council will consider an agreement with Slide Guys Restoration Inc. for waterslide maintenance services at The Wave.

**STAFF RECOMMENDATION:**

Adopt the **Resolution** Approving an Agreement with Slide Guys Restoration Inc. for Waterslide Maintenance Services and approve the budget change.

Staff Report
Attachment 1 - Resolution Approving an Agreement with Slide Guys Restoration Inc. for Waterslide Maintenance Services
Attachment 2 - Exhibit A to the Resolution - Agreement Between the City of Dublin and Slide Guys Restoration Inc.
Attachment 3 - Proposal - Slide Guys Restoration Inc.
Attachment 4 - Request for Proposals
Attachment 5 - Budget Change Form

**4.5 Acceptance of Work – Project No. GI0119, Civic Center HVAC and Roof Replacement Project**

The City Council will consider the acceptance of the Civic Center HVAC and Roof Replacement Project, CIP No. GI0119. The project included the replacement of the flat roof assembly, roof-mounted HVAC equipment, modifications to the existing HVAC duct system, HVAC controls, minor structural upgrades, fire alarm panel and ancillary devices, T-bar ceilings and recessed lighting, interior painting, and new ethernet data cable drops.

**STAFF RECOMMENDATION:**
Adopt the **Resolution** Accepting the Civic Center HVAC and Roof Replacement Project, CIP No. GI0119.
Staff Report
Attachment 1 - Resolution Accepting the Civic Center HVAC and Roof Replacement Project, CIP No. GI0119
Attachment 2 - CIP No. GI0119

**4.6 Avalon West/St. Patrick's Way Development Public Art**
The City Council will consider approving AvalonBay Communities proposal for public art at the Avalon West/St. Patrick's Way development project that is now under construction. The proposed artwork, designed by artist Norie Sato, is adjacent to the new residential building and would parallel the north side of St. Patrick's Way, between Golden Gate Drive and Regional Street.
**STAFF RECOMMENDATION:**
Approve the artwork proposal by AvalonBay Communities for the Avalon West/St. Patrick's Way development project.
Staff Report
Attachment 1 - Artwork Design Proposal by Artist Norie Sato

**4.7 Authorizing Remote Meetings of City Council and City Commissions Due to Increase in COVID-19 Cases**
From March 2020 through September 2021, the City conducted meetings of its legislative bodies remotely pursuant to various executive orders that suspended certain Brown Act provisions. In October 2021, the City returned to in-person meetings and the Brown Act was amended to allow for teleconferencing during a state of emergency. Under the new law, AB 361, the City can continue to conduct virtual meetings where the Governor has proclaimed a State of Emergency, or state or local health officials have imposed or recommended social distancing, if the City Council makes certain required findings. From January 11 – February 10, 2022, and since May 3, 2022, the City Council has operated under a resolution pursuant to AB 361 authorizing teleconferenced meetings for at least 30 days. The City Council will consider adopting a resolution that would allow for virtual attendance for the next 30 days.
**STAFF RECOMMENDATION:**
Adopt the **Resolution** Finding That There is a Proclaimed State of Emergency; Finding That Meeting in Person Would Present Imminent Risks to the Health or Safety of Attendees as a Result of the State of Emergency; and Authorizing Remote Teleconferenced Meetings of the Legislative Bodies of the City of Dublin Pursuant to AB 361.
Staff Report
Attachment 1 - Resolution Finding That There is a Proclaimed State of Emergency; Finding That Meeting in Person Would Present Imminent Risks to the Health or Safety of Attendees as a Result of the State of Emergency

**4.8 Authorize the City Manager to Execute Parcel Map 10999 as Property Owner**
The City Council will consider authorizing the City Manager to execute Parcel Map 10999 as property owner to allow for the merger and subdivision of parcels for Don Biddle Community Park.
**STAFF RECOMMENDATION:**

Adopt the **Resolution** Authorizing the City Manager to Execute the Owner's Statement of Parcel Map 10999 on Behalf of the City of Dublin.
Staff Report
Attachment 1 - Resolution Authorizing the City Manager to Execute the Owners Statement of Parcel Map 10999 on Behalf of the City of Dublin
Attachment 2 - Parcel Map 10999

**4.9 Annual Proclamation**
The City Council will review the Official Proclamation List and consider approval of the Annual Proclamation.
**STAFF RECOMMENDATION:**
Accept the Official Proclamation List and approve the Annual Proclamation.
Staff Report
Attachment 1 - Official List of Proclamations
Attachment 2 - City of Dublin Annual Proclamation

## 5. WRITTEN COMMUNICATION – None.

## 6. PUBLIC HEARING

**6.1 Bicycle and Pedestrian Plan Update**
The City Council will hold a public hearing to review and consider adopting the proposed update to the City's Bicycle and Pedestrian Plan. This includes an exemption from review under the California Environmental Quality Act. The proposed Plan updates and replaces the 2014 Bicycle and Pedestrian Master Plan and will inform future infrastructure, program, and policy recommendations.
**STAFF RECOMMENDATION:**
Conduct the public hearing, deliberate, and adopt the **Resolution** Adopting the Bicycle and Pedestrian Plan and Finding the Plan Exempt From the California Environmental Quality Act.
Staff Report
Attachment 1 - Resolution Adopting the Bicycle and Pedestrian Plan and Finding the Plan Exempt from the California Environmental Quality Act
Attachment 2 - Exhibit A to Resolution - CEQA Exemption Eligibility Memo
Attachment 3 - Exhibit B to Resolution - Draft Dublin Bicycle and Pedestrian Plan
Attachment 4 - Appendices to Draft Dublin Bicycle and Pedestrian Plan
Attachment 5 - Planning Commission Resolution No. 22- 15 Recommending that the City Council Adopt the Bicycle and Pedestrian Plan and Find the Plan Exempt from the California Environmental Quality Act
Item 6.1 PowerPoint Presentation

## 7. UNFINISHED BUSINESS

**7.1 Local Roadway Safety Plan**
The City Council will receive a report and consider adopting the Local Roadway Safety Plan, which provides a local-level assessment of roadway safety and identifies high-risk locations, appropriate safety improvements, and strategies to improve safety for roadways in the City of Dublin.

**STAFF RECOMMENDATION:**
Adopt the **Resolution** Adopting the Local Roadway Safety Plan and Finding the Plan Exempt From the California Environmental Quality Act.
Staff Report
Attachment 1 - Resolution Adopting the Local Roadway Safety Plan and Finding the Plan Exempt from the California Environmental Quality Act
Attachment 2 - Exhibit A to the Resolution - Draft Local Roadway Safety Plan
Attachment 3 - Appendices to the Local Roadway Safety Plan
Attachment 4 - CIP Project No. ST0122 Local Roadway Safety Plan
Attachment 5 - CIP Project No. ST0123 Traffic Signal and Safety Improvements
Item 7.1 PowerPoint Presentation

## 8. NEW BUSINESS

## 9. OTHER BUSINESS

Brief information only reports from City Council and/or Staff, including committee reports and reports by City Council related to meetings attended at City expense (AB1234).

## 10. ADJOURNMENT

This AGENDA is posted in accordance with Government Code Section 54954.2(a)

If requested, pursuant to Government Code Section 54953.2, this agenda shall be made available in appropriate alternative formats to persons with a disability, as required by Section 202 of the Americans with Disabilities Act of 1990 (42 U.S.C. Section 12132) (ADA), and the federal rules and regulations adopted in implementation thereof. To make a request for disability-related modification or accommodation, please contact the District Clerk's Office (925) 833-6650 at least 72 hours in advance of the meeting. Upon receiving a request, the District will swiftly resolve requests for reasonable accommodation for individuals with disabilities, consistent with the federal ADA, and resolve any doubt in favor of accessibility.

Agenda materials that become available within 72 hours in advance of the meeting, and after publishing of the agenda, will be available at Civic Center, 100 Civic Plaza, and will be posted on the District's website at www.dublin.ca.gov/ccmeetings.

*Mission*

*The City of Dublin promotes and supports a high quality of life, ensures a safe and secure environment, fosters new opportunities, provides equity across all programs, and champions a culture of diversity and inclusion.*

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: 2022 Sponsor Recognition
*Prepared by: Lauren Marriott, Recreation Coordinator*

### EXECUTIVE SUMMARY:

The City Council will recognize sponsors who contributed to City events, programs, and facilities in 2022.

### STAFF RECOMMENDATION:

Recognize the 2022 sponsors.

### FINANCIAL IMPACT:

The City received over $95,620 in cash sponsorships and $18,426 in in-kind sponsorships in 2022. Sponsorships help offset the cost of producing special events and operating City programs and facilities, reducing the overall impact on the General Fund.

### DESCRIPTION:

Through its Donation and Sponsorship Policy, the City invites and encourages local businesses and corporations to partner as sponsors of the City, providing cash or in-kind contributions to support City events, programs, and facilities in exchange for appropriate sponsorship recognition. Sponsors who contributed in 2022 are listed in Attachment 1.

The City Council does not need to take any action beyond recognizing the sponsors. According to the Donation and Sponsorship Policy adopted by the City Council in 2017, the City Council is only required to formally accept individual donations that exceed $45,000.

### STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted.

## ATTACHMENTS:

1) 2022 City of Dublin Sponsor List

# 2022 Donations & Sponsorships

| EVENT OR DEPARTMENT | CASH | IN-KIND | ITEM |
|---|---|---|---|
| **St. Patrick's Day Celebration** | | | |
| 5421 at Dublin Station-UDR Apartments | $4,000 | | |
| Alamo Ace Hardware | $6,000 | | |
| Barker Heating and Cooling | $2,000 | | |
| Baylight Baptist Church | $2,000 | | |
| Dublin Pediatric Dentistry and Orthodontics | $2,000 | | |
| Dublin United Soccer League | $2,000 | | |
| East Bay Community Energy | $2,000 | | |
| Empower Martial Arts | $2,000 | | |
| Foothill Chiropractic | $2,000 | | |
| Half Price Books | $2,000 | | |
| Joya | $2,000 | | |
| KeyPoint Credit Union | $2,000 | | |
| Lucky California | $4,000 | | |
| Madden Marketing/Bay Area News Group | $2,000 | | |
| Patelco Credit Union | $1,000 | | |
| Safeway | $4,000 | | |
| Sameer Hakim Remax | $4,000 | | |
| Solar Bill | $2,000 | | |
| Sutter Health | $2,000 | | |
| Welk Resorts | $2,000 | | |
| Xfinity | $2,000 | | |
| **Shamrock 5K Fun Run and Walk** | | | |
| Challenge Dairy | $750 | | |
| IBEW | $750 | | |
| INC 82 Brewing | | $500 | gift cards |
| Joya | $750 | | |
| Logo Boss | $750 | | |
| Orange Theory | $750 | | |
| Pacific Catch | $250 | | |
| Stanford Children's Health | $750 | | |
| **Splatter** | | | |
| Half Price Books | $370 | | |
| California Renewable Energy | $2,000 | | |
| Dimen Group Inc | $4,000 | | |
| Joya | $1,000 | | |
| KeyPoint Credit Union | $850 | | |
| Provident Credit Union | $2,000 | | |
| **Tree Lighting** | | | |
| Cool Earth Solar | $350 | | |
| Go-Green Driving School | $350 | | |
| Grace Life Church | $350 | | |
| Joya | $350 | | |
| Madden Marketing/Bay Area News Group | $350 | | |
| New Life Church | $250 | | |

| | | | |
|---|---|---|---|
| **Spring Eggstravaganza** | | | |
| Dublin Pediatric Dentistry and Orthodontics | $500 | | |
| Kids Care Dental and Orthodontics | $500 | | |
| **Harvest Fair** | | | |
| Dublin Pediatric Dentistry and Orthodontics | $500 | | |
| Empower Martial Arts | $500 | | |
| Madden Marketing/Bay Area News Group | $500 | | |
| **Farmers' Market** | | | |
| 5421 at Dublin Station-UDR Apartments | $2,000 | | |
| American Swim Academy | $600 | | |
| Empower Martial Arts | $1,300 | | |
| Foothill Chiropractic | $2,000 | | |
| Grace Life Church | $600 | | |
| Joya | $3,000 | | |
| KeyPoint Credit Union | $1,400 | | |
| Landmark Exteriors | $350 | | |
| Madden Marketing/Bay Area News Group | $300 | | |
| Poppy Bank | $350 | | |
| Solar Bill | $900 | | |
| WellNest | $600 | | |
| **Breakfast with Santa** | | | |
| Grace Life Church | $250 | | |
| Joya | $350 | | |
| **Floating Pumpkin Patch** | | | |
| Joya | $200 | | |
| Madden Marketing/Bay Area News Group | $150 | | |
| **Picnic Flix** | | | |
| 5421 at Dublin Station-UDR Apartments | $100 | | |
| Empower Martial Arts | $700 | | |
| Poppy Bank | $350 | | |
| Sutter Health | $700 | | |
| **Trail Challenge** | | | |
| Empower Martial Arts | $500 | | |
| KeyPoint Credit Union | $250 | | |
| **Senior Center** | | | |
| Aetna | $1,000 | | |
| Dublin Senior Foundation | | $15,826 | 9 sets of patio furniture |
| Kaiser Permanente | | $1,800 | Bi-Weekly Visits |
| KeyPoint Credit Union | | $150 | Raffle Gifts |
| Sunrise of Pleasanton | | $150 | Raffle Gifts |
| **Dublin Police Services** | | | |
| Altamont Cruisers | $3,000 | | |
| **Economic Development** | | | |
| American Realty Advisors | $1,000 | | |
| Darly L. Paulson | $200 | | |
| Hines | $1,000 | | |
| **TOTAL** | **$95,620** | **$18,426** | |

DUBLIN
CALIFORNIA

# 2022 Sponsor Recognition

January 10, 2023
City Council Meeting – Item 3.1

# 2022 Sponsorship Overview

- $95,620 received in cash sponsorships.
- $18,426 received in in-kind sponsorships.
- Funds and donated goods are used to offset the costs of producing special events and running programs, facilities and services.

# St. Patrick's Day Celebration















# Spring Eggstravaganza












# Farmers Market & Summer Concert Series

















# Picnic Flix














# Splatter

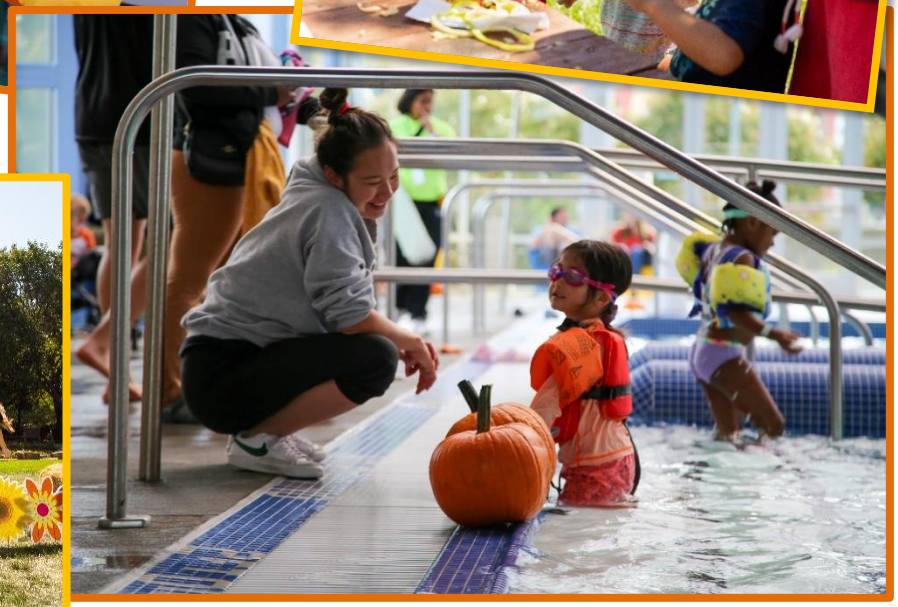


# Fall Events











# Holiday Events












# Senior Center









# Thank You!


Hamo
ACE
Hardware
DIMEN GROUP INC.
JOYA SOUL
Dublin
Pediatric Dentistry
& Orthodontics
EVERY SEASON STARTS AT
DICK'S
SPORTING GOODS
KEYPOINT
CREDIT UNION
Waterford
Pediatrics & Orthodontics
MADDEN
MARKETING
Lucky
California
5421
xfinity
SAFEWAY
LIONS
EMPOWER
MARTIAL ARTS
Welk
RESORTS
PROVIDENT
CREDIT UNION
Foothill Chiropractic
SOLAR
BILLREVIEW
TEAM
SUNPOWER
HALF PRICE
BOOKS
EAST BAY
COMMUNITY
ENERGY
BAYLIGHT
BAPTIST CHURCH
Barker
Sutter Health
Palo Alto Medical
Foundation
SAMEER
MAXIM

Agenda Item 3.2

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Recognition of Parks Reserve Forces Training Area 80th Anniversary
*Prepared by: Cierra Fabrigas, Executive Aide*

### EXECUTIVE SUMMARY:

The City Council will recognize Parks Reserve Forces Training Area's 80th Anniversary.

### STAFF RECOMMENDATION:

Present Certificate of Recognition to Parks Reserve Forces Training Area.

### FINANCIAL IMPACT:

None.

### DESCRIPTION:

On January 19, 2023, Parks Reserve Forces Training Area is celebrating their 80th Anniversary in the City of Dublin.

### STRATEGIC PLAN INITIATIVE:

None.

### NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted.

### ATTACHMENTS:

1) Certificate of Recognition

# CERTIFICATE OF RECOGNITION

is given to the

## *PARKS RESERVE FORCES TRAINING AREA*

In celebration of its 80th anniversary, and for its long-standing partnership with the City and the continued support it provides to the community, the City of Dublin congratulates and commends the PRFTA team.

Presented by the

City Council of the City of Dublin

Dated: January 10, 2023

Mayor Melissa Hernandez

Vice Mayor Michael McCorriston

Councilmember Sherry Hu

Councilmember Jean Josey

Councilmember Kashef Qaadri

Agenda Item 3.3

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Recognition of the 2022 "Deck the Homes" Holiday Home Decorating Contest Winners
*Prepared by: Tyler Phillips, Heritage and Cultural Arts Supervisor*

### EXECUTIVE SUMMARY:

The City Council will receive a presentation on the 2022 "Deck the Homes" Holiday Home Decorating Contest and present Certificates of Recognition to the winners.

### STAFF RECOMMENDATION:

Present Certificates of Recognition to the 2022 "Deck the Homes" Holiday Home Decorating Contest winners.

### FINANCIAL IMPACT:

Expenses for the program are included in the annual operating budget.

### DESCRIPTION:

The "Deck the Homes" Holiday Home Decorating Program is intended to encourage and celebrate those residents who decorate their homes for the holidays. The Parks and Community Services Department organizes the program and utilizes the Parks and Community Services Commissioners as judges. The program was introduced in 2018, making 2022 its fifth season.

Individual homes are judged in six categories. Winners receive a yard sign, a $50 gift card to a local business, and a certificate of recognition from the City Council.

<u>2022 "Deck the Homes" Program</u>
To promote the Holiday Home Decorating Contest, Staff utilized the City's website and social media platforms and sent invitations to past participants. The deadline for submissions was December 9, 2022.

Fifteen applications were received, totaling 25 different entries. Commissioners from the Parks and Community Services Commission individually judged participating homes by visiting the locations December 12-16, 2022.

At its December 19, 2022 meeting, the Commission voted on category winners. Contest winners were notified on December 20, 2022, and received yard signs to display and a gift card from a local business. The homes were judged based on the following categories and criteria:

- Seen from Space Award - Best use of lights and color
- Winter Wonderland Award - Best use of music, movement, and technology
- Gingerbread House Award – Best use of homemade decorations
- Over Inflated - Best use of inflatables
- Deck the Halls Award - Best condo/apartment
- Candy Cane Lane Award - Best neighborhood – three or more homes

Photos of the 2022 contest winners are included with this Staff Report (Attachment 1).

| Deck the Homes Winners | | |
|---|---|---|
| **Award Categories** | **Number of Entries** | **Winning Home Address** |
| Seen from Space | 9 | 7574 Sutton Lane |
| Winter Wonderland | 4 | 7287 Bedford Way |
| Gingerbread House | 1 | 11913 Bloomington Way |
| Over Inflated | 7 | 11319 Champagne Place |
| Deck the Halls | 2 | 3654 Avaino Way |
| Candy Cane Lane | 2 | 7964 Gunshot Court |

## STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted.

## ATTACHMENTS:

1) 2022 Holiday Home Decorating Contest Winners
2) 2022 Holiday Home Decorating Contest Flyer

DUBLIN
CALIFORNIA

# 2022 "Deck The Homes" Holiday Home Decorating Contest

# WINNERS!

# Seen From Space Award
# Bonato Family – 7574 Sutton Ln.



**Best use of lights and color**

# Winter Wonderland Award Brandt Family – 7287 Bedford Way



**Best use of music, movement, & technology**

# Gingerbread House Award
# Gasper Family - 11913 Bloomington Way



**Best use of homemade decorations**

# Over Inflated Award
# Valdez Family – 11319 Champagne Pl.




**Best use of inflatables**

# Deck the Halls Award
# Dhot Family – 3654 Avaino Way



# Candy Cane Lane Award
# Harris Family & Neighbors - 7964 Gunshot Ct.








**Best neighborhood, three or more houses**

CELEBRATING 40 YEARS 1982 — 2022
DUBLIN CALIFORNIA



CITY OF DUBLIN

# 2022 HOLIDAY HOME DECORATING CONTEST

## Do you have the most festive holiday display in town?

The City of Dublin invites Dublin residents to participate in the City's Holiday Home Decorating Contest. One winner will be chosen from each of the following categories:

- **Seen from Space** – *best use of lights and color*
- **Winter Wonderland** – *best use of music, movement, and technology*
- **Gingerbread House** – *best use of homemade decorations*
- **Over Inflated** – *best use of inflatables*
- **Deck the Halls** – *best apartment/condo/townhome*
- **Candy Cane Lane** – *best neighborhood; three or more homes*

Category winners will receive a special yard sign and a $50 gift certificate from a local business.

**Entry forms are available** online at **www.dublin.ca.gov/holidayhappenings** or by request from tyler.phillips@dublin.ca.gov.

**The deadline to enter is Friday, December 9th at 4:00 p.m.** Judging will take place December 12-16, and winners will be announced on December 20.

## "DECK THE HOMES" IN OUR NEW AMERICAN BACKYARD

DUBLIN CALIFORNIA

DUBLIN
CALIFORNIA

# 2022 "Deck the Homes" Holiday Home Decorating Contest

January 10, 2023
City Council Meeting – Item 3.3

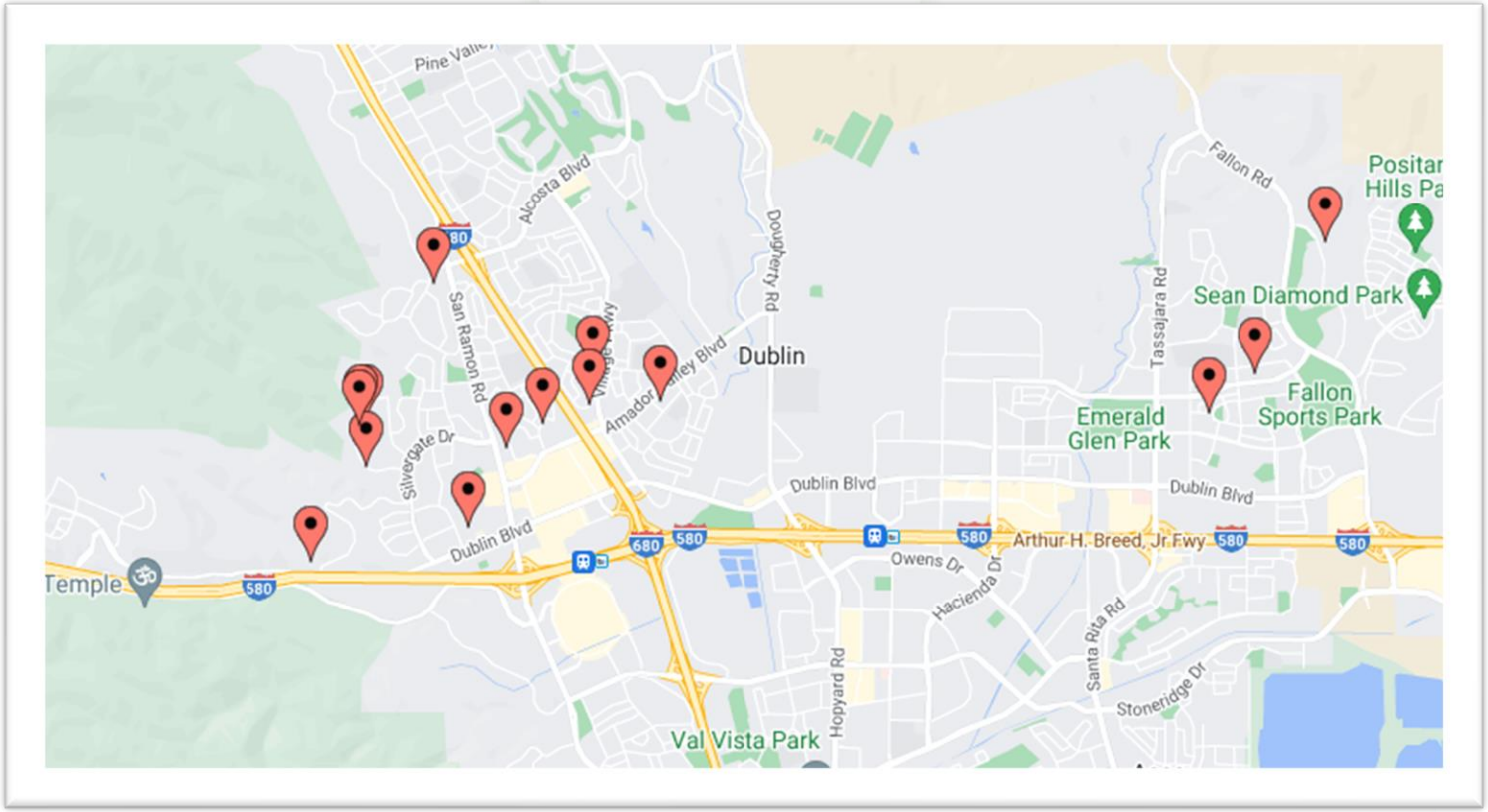
# Deck the Homes

- 5th Year for Residential Home Decorating Contest
- Judges - Commissioners from the Parks & Community Services Commission.
- Winners selected at the December 19, 2022, Parks & Community Services Commission meeting.
- Award winners received yard signs, Certificates of Recognition and a gift card to a local business.

# Deck the Homes

- 15 Individual Homes.
- 25 Category Entries.
- 2022 Categories:
  1. Seen From Space – Best Use of Lights and Color
  2. Winter Wonderland Award – Best Use of Music, Movement, & Technology
  3. Gingerbread House Award – Best Use of Homemade Decorations
  4. Over Inflated Award – Best Use of Inflatables
  5. Deck the Halls Award – Best Condo/Apartment
  6. Candy Cane Lane Award – Best Neighborhood (Three or More Homes)

# Deck the Homes Map



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# Contest Winners

# Seen From Space Award
# Bonato Family – 7574 Sutton Ln.



# Winter Wonderland Award
# Brandt Family – 7287 Bedford Way.



**Best Use of Music, Movement & Technology**

# Gingerbread House Award
# Pena-Gasper Family - 11913 Bloomington Way



**Best Use of Homemade Decorations**

# Over Inflated Award
# Valdez Family – 11319 Champagne Pl.



# Deck the Halls Award
# Dhot Family – 3654 Avaino Way



# Candy Cane Lane Award
# Harris Family & Neighbors - 7964 Gunshot Ct.







DUBLIN
CALIFORNIA

# Thank You

Agenda Item 3.4

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Employee Introductions
*Prepared by: Sarah Monnastes, Human Resources Director*

### EXECUTIVE SUMMARY:

New City of Dublin Staff members, Gabrielle Abdon, Associate Civil Engineer, with the Public Works Department, and Gary Gosal, Captain, with Dublin Police Services, will be introduced.

### STAFF RECOMMENDATION:

Welcome the new City of Dublin Staff members.

### FINANCIAL IMPACT:

None.

### DESCRIPTION:

New City of Dublin Staff members, Gabrielle Abdon, Associate Civil Engineer, with the Public Works Department, and Gary Gosal, Captain, with Dublin Police Services will be introduced.

### STRATEGIC PLAN INITIATIVE:

None.

### NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted.

### ATTACHMENTS:

None.

Agenda Item 4.1

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Approval of the December 20, 2022 Regular City Council Meeting Minutes
*Prepared by: Marsha Moore, MMC, City Clerk*

### EXECUTIVE SUMMARY:

The City Council will consider approval of the minutes of the December 20, 2022 Regular City Council Meeting.

### STAFF RECOMMENDATION:

Approve the minutes of the December 20, 2022 Regular City Council Meeting.

### FINANCIAL IMPACT:

None.

### DESCRIPTION:

The City Council will consider approval of the minutes of the December 20, 2022 Regular City Council Meeting.

### STRATEGIC PLAN INITIATIVE:

None.

### NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted.

### ATTACHMENTS:

1) December 20, 2022 Regular City Council Meeting Minutes

# MINUTES OF THE CITY COUNCIL OF THE CITY OF DUBLIN

Regular Meeting: December 20, 2022

The following are minutes of the actions taken by the City of Dublin City Council. A full video recording of the meeting with the agenda items indexed and time stamped is available on the City's website at: https://dublin.ca.gov/ccmeetings

## REGULAR MEETING 7:00 PM

A Regular Meeting of the Dublin City Council was held on Tuesday, December 20, 2022, in the City Council Chamber. The meeting was called to order at 7:06 PM, by Mayor Hernandez.

## 1) CALL TO ORDER

| Attendee Name | Status |
|---|---|
| Melissa Hernandez, Mayor | Present |
| Jean Josey, Vice Mayor | Present |
| Shawn Kumagai, Councilmember | Present |
| Michael McCorriston, Councilmember | Present |
| Dr. Sherry Hu, Councilmember | Present |

## 2) PLEDGE OF ALLEGIANCE

## 3) ORAL COMMUNICATIONS

### 3.1) Employee Introduction

New City of Dublin Staff member, Skyler Donn Schifano, Senior Office Assistant with the Public Works Department, was introduced.

### 3.2) Presentation from Caltrans regarding the project along I-680 in Alameda and Contra Costa Counties

The City Council received a presentation from Jack Siauw with Caltrans about the Caltrans Bay Area (District 4) I-680 Pavement Rehabilitation Project in Alameda and Contra Costa Counties which began in December.

## 3.3) Recognition of Outgoing Alameda County District Attorney Nancy O'Malley

The City Council presented a commendation to outgoing Alameda County District Attorney Nancy O'Malley, in appreciation of her dedicated service to the County of Alameda and City of Dublin.

## 3.4) Recognition of Outgoing Alameda County Sheriff Gregory Ahern

The City Council presented a commendation to outgoing Alameda County Sheriff Gregory Ahern, in appreciation of his dedicated service to the County of Alameda and City of Dublin.

## 3.5) Public Comment

Shawn Costello provided public comment.

Brent Songey provided public comment.

Pavani Vankayala provided public comment.

## 4) CONSENT CALENDAR

4.1) Approved the December 6, 2022 Regular City Council Meeting Minutes.

4.2) Adopted Resolution No. 145-22 titled, "Accepting the Annual Street Resurfacing Project (2021 Slurry Seal), CIP No. ST0117."

4.3) Adopted Resolution No. 146-22 titled, "Approving an Agreement with East Bay Pool Service for Pool Maintenance Services."

4.4) Received the report of payments issued from November 1, 2022 - November 30, 2022, totaling $10,620,676.06.

4.5) Adopted Resolution No. 147-22 titled, "Amending the Benefit Plan."

4.6) Approved the 2023 City Council Meeting Calendar.

4.7) Received a report on the Annual Comprehensive Financial Report (ACFR) and Annual Audit for Fiscal Year Ending June 30, 2022, and Supplemental Reports Completed by the City's Independent Auditors.

4.8) Adopted Resolution No. 148-22 titled, "Finding That There is a Proclaimed State of Emergency; Finding that Meeting in Person Would Present Imminent Risks to the Health or Safety of Attendees as a Result of the State of Emergency; and Authorizing Remote Teleconferenced Meetings of the Legislative Bodies of the City of Dublin Pursuant to AB 361."

4.9) Adopted Resolution No. 149-22 titled, "Delegating Authority to the City Manager to Purchase Police Vehicles Exceeding $45,000 For Fiscal Year 2022-23."

On a motion by Councilmember Kumagai, seconded by Councilmember McCorriston, and by unanimous vote, the City Council adopted the Consent Calendar.

| | |
|---|---|
| RESULT: | ADOPTED [UNANIMOUS] |
| MOVED BY: | Shawn Kumagai, Councilmember |
| SECOND: | Michael McCorriston, Councilmember |
| AYES: | Hernandez, Josey, Kumagai, McCorriston, Hu |

5) WRITTEN COMMUNICATION – None.

6) PUBLIC HEARING – None.

7) UNFINISHED BUSINESS – None.

8) NEW BUSINESS

8.1) Certification of November 8, 2022 Election Results

The City Council received a presentation on the November 8, 2022 election results for the Office of Mayor and two City Councilmembers from the Alameda County Registrar of Voters.

On a motion by Councilmember Kumagai, seconded by Councilmember McCorriston, and by unanimous vote, the City Council adopted Resolution No. 150-22 titled, "Reciting the Facts of the General Municipal Election Held on November 8, 2022, Declaring the Results Thereof, and Other Such Matters as are Provided by Law."

| | |
|---|---|
| RESULT: | ADOPTED [UNANIMOUS] |
| MOVED BY: | Shawn Kumagai, Councilmember |
| SECOND: | Michael McCorriston, Councilmember |
| AYES: | Hernandez, Josey, Kumagai, McCorriston, Hu |

8.2) Presentation to Outgoing Councilmember Shawn Kumagai

The City made a presentation to outgoing Councilmember Shawn Kumagai, in appreciation of his dedicated service to the City.

Councilmember Kumagai received recognition from Congressman Eric Swalwell, State Senator Steve Glazer, Assemblymember Rebecca Bauer-Kahan, and Parks Reserves Forces Training Area.

Inge Houston provided public comment.

Shawn Costello provided public comment.

Mayor Hernandez called for a five-minute recess at 8:26 p.m.

Mayor Hernandez reconvened the meeting at 8:32 p.m.

## 8.3) Administration of Oath of Office to Councilmembers-Elect Jean Josey and Kashef Qaadri and Mayor-Elect Melissa Hernandez

The Oath of Office was administered to Councilmembers-elect Jean Josey and Kashef Qaadri and Mayor-elect Melissa Hernandez.

## 8.4) Selection of Vice Mayor

The City Council's policy is to select, in December of each year, a member of the City Council to serve as Vice Mayor for a period of one year. In the absence of the Mayor, the Vice Mayor would become Mayor Pro Tempore and would assume the temporary responsibilities of the Mayor.

Mayor Hernandez nominated Councilmember Michael McCorriston as Vice Mayor.

Vice Mayor Josey nominated Councilmember Sherry Hu as Vice Mayor.

On a motion by Mayor Hernandez, and by unanimous vote, Councilmember McCorriston was appointed to serve as Vice Mayor for a one-year period from December 2022 – December 2023.

| | |
|---|---|
| RESULT: | APPOINTED [UNANIMOUS] |
| NOMINATED BY: | Melissa Hernandez, Mayor |
| AYES: | Hernandez, McCorriston, Josey, Hu, Qaadri |

## 8.5) Mayor's Appointment to City Commissions and Committees

Mayor Hernandez recommended the following appointments:

Planning Commission

The re-appointment of Janine Thalblum and Catheryn Grier, each to four-year terms which expire in December 2026; the appointment of Matthew Aini to the unscheduled vacancy with a two-year term which expires in December 2024; and the appointment of alternates Wahida Rashid (Alternate 1) and Nicholas Ochoa (Alternate 2), each to two-year terms which expire in December 2024.

Heritage and Cultural Arts Commission
The re-appointment of Gina Gabriell and the appointment of Timea Iharosi and Kim Hudson, each to four-year terms which expire in December 2026; A Kelly Paschal-Hunter to the unscheduled vacancy with a two-year term which expires in December 2024; and the appointment of alternate Darren Phillips to a two-year term which expires in December 2024.

Human Services Commission
The appointment of Rose Hunt and Baljeet Sangha, each to four-year terms which expire in December 2026; and the appointment of alternate Mariam Noorzad (Alternate 1) and Siyu Henningsen (Alternate 2), each to two-year terms which expire in December 2024,

Parks and Community Services Commission
The re-appointment of Sameer Hakim and Joe Washington and the appointment of Richard Thornbury, each to four-year terms which expire in December 2026; and the appointment of alternates Daniel Colley (Alternate 1) and Laura Gan (Alternate 2), each to two-year terms which expire in December 2024.

Senior Center Advisory Committee
The re-appointment of Christy Li and Kebin Lu and the appointment of Loc Valencia, each to four-year terms which expire in December 2026; and the appointment of alternates Shweta Bhatnagar (Alternate 1) and Candy Velasco (Alternate 2), each to two-year terms which expire in December 2024.

On a motion by Councilmember Josey, seconded by Councilmember Qaadri, and by unanimous vote, the City Council confirmed the Mayor's appointments to the various commissions and committees.

| | |
|---|---|
| RESULT: | ADOPTED [UNANIMOUS] |
| MOVED BY: | Jean Josey, Councilmember |
| SECOND: | Kashef Qaadri, Councilmember |
| AYES: | Hernandez, McCorriston, Josey, Hu, Qaadri |

## 8.6) City Council Committee Appointments and Assignments

The City Council discussed the Mayor's proposed appointments and the Mayor added Councilmember Josey as the alternate to the East Bay Division of the League of California Cities, switched Vice Mayor McCorriston's and Councilmember Qaadri's positions on the Tri-Valley Affordable Housing Committee, replaced Councilmember Josey with Councilmember Qaadri as the member on the ABAG General Assembly, and replaced Councilmember Josey with Councilmember Hu as the member on the Alameda County Fire Department Advisory Committee.

On a motion by Vice Mayor McCorriston, seconded by Councilmember Hu, and by unanimous vote, the City Council adopted Resolution No. 151-22 titled, "Confirming the Mayor's Appointments to Various Local and Regional Boards, Committees, and Commissions," as amended and directed Staff to notify affected agencies, as appropriate.

| | |
|---|---|
| RESULT: | ADOPTED [UNANIMOUS] |
| MOVED BY: | Michael McCorriston, Vice Mayor |
| SECOND: | Dr. Sherry Hu, Councilmember |
| AYES: | Hernandez, McCorriston, Josey, Hu, Qaadri |

## 9) OTHER BUSINESS – None.

## 10) ADJOURNMENT

Mayor Hernandez adjourned the meeting at 9:16 p.m.

_____
Mayor

ATTEST:

_____
City Clerk

Agenda Item 4.2

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Youth Mini-Grant Funding Recommendations Approval
*Prepared by: Liz Elliott, Recreation Supervisor*

### EXECUTIVE SUMMARY:

The City Council will consider approving the Youth Advisory Committee Mini-Grant Program recommended funding allocations.

### STAFF RECOMMENDATION:

Adopt the **Resolution** Approving Funding Recommendations for Fiscal Year 2022-23 for the Youth Advisory Committee Mini-Grant Program.

### FINANCIAL IMPACT:

The Youth Mini-Grant Program is supported by the General Fund in the amount of $2,500 for Fiscal Year 2022-23.

### DESCRIPTION:

The City established the Mini-Grant Program in Fiscal Year 2012-13 to support youth organizations that offer programs for middle and high school students other than those offered by the Parks and Community Services Department. Each year, Dublin-based youth organizations/clubs have an opportunity to apply for grant funding to assist them in offering activities to the community, including performing arts, sports, multicultural awareness, health awareness, or other activities that support projects or programs benefiting Dublin youth. Funding is recommended annually by the Youth Advisory Committee (YAC) and awarded by the City Council to organizations/clubs that best meet the needs of Dublin youth.

At a Special Meeting on March 5, 2020, the City Council opted to increase funding for the Youth Mini-Grant program from $1,600 to $2,500. The increase in funding was incorporated into the Fiscal Year 2020-21 and future year operating budgets.

The Youth Mini-Grant application was placed online Monday, October 3, 2022, with a submittal deadline of November 3, 2022. The program was advertised via social media, the City's website, at

Dublin high and middle schools, and was sent to the YAC to assist with publicity.

At its Special Meeting on November 16, 2022, the YAC received presentations and used a criteria form (Attachment 2) to review, rate, and develop funding recommendations for each of the following applicants:

1. DubMed
2. Gardeners of the Galaxy
3. SHAPE (Student Health Advocates for a Positive Environment)
4. Teens Unite for Education

After the presentations, YAC members deliberated and further discussed the applicants, specifically Gardeners of the Galaxy and Student Health Advocates for a Positive Environment (SHAPE).

Gardeners of the Galaxy provides microgreens to the Dublin High School student lunch program that serves over 3,000 students daily. Over the past three years, the organization has doubled the amount of Dublin youth served with the help of funding from the Youth Mini-Grant Program. The Commitee discussed the proposal and awarded the full requested amount.

SHAPE focuses on improving and supporting students' overall health at Dublin High School. Their specific goal is to provide sunscreen dispensers and sunscreen for students to utilize when visiting the Sports Complex. During their oral presentation SHAPE requested an added $100 above the amount initially requested. After reviewing programming aspects, they found that the sunscreen bottles will require wall mounts, costing more for installation. The Committee discussed the idea and decided to recommend SHAPE receive an added $100. The organization serves 200 Dublin High School student-athletes.

After the presentations, YAC members deliberated and recommended funding amounts for each of the four organizations as follows:

**TABLE 1: RECOMMENDED FUNDING AMOUNTS**

| Organization | Grant Requested FY 22-23 | Grant Proposal | YAC Funding Recommendation | YAC Points Average |
|---|---|---|---|---|
| **DubMed** | $500 | Print copies of medical articles written by students | $200 | 9.3 |
| **Gardeners of the Galaxy** | $1,500 | Purchase trays, soil, seeds to grow Microgreens | $1,500 | 13.6 |
| **SHAPE (Student Health Advocates for a Positive Environment)** | $350 | Purchase sunscreen for student-athletes to put in sports complex at Dublin High School | $450 | 12.9 |
| **Teens Unite for Education** | $500 | Purchase backpacks and | $350 | 11.2 |

| | | | | |
|---|---|---|---|---|
| | | school supplies to provide to under-privileged preschoolers | | |
| **Totals** | **$2,850** | | **$2,500** | |

Upon completion of their projects, grant recipients will have two weeks to complete a brief project report on how funds were used and the number of youths impacted. Grantees are encouraged to supply photos, testimonials, and flyers used to promote their projects. Those who do not submit a report in a timely fashion may not be considered for future Youth Mini-Grants.

At its December 19, 2022, meeting, the Parks and Community Services Commission confirmed the selections made by the YAC and recommended the funding allocations to the City Council.

## STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted, and a copy of this Staff Report was sent to the applicants.

## ATTACHMENTS:

1) Resolution Approving Funding Recommendations for Fiscal Year 2022-23 Youth Advisory Committee Mini-Grant Program
2) YAC Mini-Grant Rating Form
3) Fiscal Year 2022-23 Mini-Grant Applications and Proposals

**RESOLUTION NO. XX – 23**

**APPROVING FUNDING RECOMMENDATIONS FOR FISCAL YEAR 2022-23 YOUTH ADVISORY COMMITTEE MINI-GRANT PROGRAM**

**WHEREAS,** the City received four applications for the Fiscal Year 2022-23 Youth Advisory Committee Mini-Grant Program; and

**WHEREAS,** the total amount of funding requested exceeds funding availability; and

**WHEREAS**, funding for the Mini-Grant Program is provided for in the adopted City of Dublin General Fund Budget; and

**WHEREAS,** on November 16, 2022, the Youth Advisory Committee recommended four youth organizations/clubs to receive grant funding through the Mini-Grant Program; and

**WHEREAS,** on December 19, 2022, the Parks and Community Services Commission reviewed the Youth Advisory Committee's funding allocations to four youth organizations/clubs; and

**WHEREAS,** the Parks and Community Services Commission has provided the City Council with funding recommendations for the Fiscal Year 2022-23 Mini-Grant Program.

**NOW, THEREFORE, BE IT RESOLVED** that the City Council of the City of Dublin does hereby approve the Youth Advisory Committee Mini-Grant Program funding allocation for Fiscal Year 2022-23 as follows:

| ORGANIZATION/ CLUB NAME | CITY COUNCIL APPROVED FUNDING |
|---|---|
| DubMed | $200 |
| Gardeners of the Galaxy | $1,500 |
| SHAPE (Student Health Advocates for a Positive Environment) | $450 |
| Teens Unite for Education | $350 |
| **Total Recommended Amount** | **$2,500** |

**PASSED, APPROVED AND ADOPTED** this 10th day of January 2023 by the following vote:

**AYES**:

**NOES**:

**ABSENT**:

**ABSTAIN**:

_____
Mayor

**ATTEST**:

_____
City Clerk

DUBLIN
CALIFORNIA

# City of Dublin
# Youth Advisory Committee
# Mini Grant Rating Form

Organization: _____ Program: _____

| | | PROPOSAL SCORE |
|---|---|---|
| *Maximum of 15 points* | | |
| RECOMMEND FUNDING | Yes ❒ No ❒ | |
| Total Requested | Total Recommended | |

RECOMMENDING FUNDING FOR THE FOLLOWING YOUTH ACTIVITIES: (CHECK ONE).

❒SCHOOL CLUB ❒SPORT ORGANIZATION ❒PERFORMING ARTS ❒CULTURAL AWARENESS
❒HEALTH AWARENESS ❒OTHER YOUTH ACTIVITY/ORGANIZATION_____

THE WORD "PROGRAM" IS USED BELOW ON THIS FORM TO INCLUDE SERVICES, ACTIVITIES OR IMPROVEMENTS.

1. Organization/Management

- Youth benefitting from or involved with the project must include 75% Dublin residents who are of middle school or high school age.
- The youth organization/group, as presented in the application, is able to achieve the stated goals and outcomes.
- The youth organization/group has completed all required aspects of the application process.
- The youth organization/group has an adult sponsor that assists in the management or oversight of the organization/group.

*(Maximum of 5)* _____

2. Needs/Benefit

- The recipients are the appropriate target group (75% Dublin youth).
- The applicant provides an activity to Dublin residents that other organizations do not provide.
- Applicant's proposed activity supports projects and programs serving or benefitting Dublin youth.
- The applicant collaborates with other youth-oriented organizations.

*(Maximum of 5)* _____

3. Funding/ Budget

- The youth organization/group described in detail what the funds will be used for.
- The youth organization/group described how they will provide verification to the YAC that the funds were used as proposed.

*(Maximum of 5)* _____

# Print

# City of Dublin Youth Advisory Committee - 2022 Youth Mini Grant Application - Submission #5371

**Date Submitted: 10/28/2022**

## Youth Advisory Committee - Youth Mini Grant Request for Proposals

**General Information:**

**A. Qualifications:**

1. Youth benefiting from or involved with the project must include at least 75% Dublin residents who are of middle or high school age.

2. Organization/Club must have an adult sponsor.

3. Organization/Club must be based within the City of Dublin.

**B. Proposal:**

The proposal must be no longer than two-and-a-half pages, double-spaced. The proposal should include the following:

1. A brief description of your organization.

2. Describe the project and how it will benefit Dublin youth.

3. Describe what and how the funds/grant will be used.

4. Explain what proof will be given to the Youth Advisory Committee that funds were used as proposed.

5. Should a grant have been awarded in the past to the same organization, a brief review of how the money was spent and how it benefitted the group needs to be highlighted in this year's presentation.

**C. Submission:**

The application and proposal will be accepted beginning Monday, October 3, 2022 at 8:00 AM., through Thursday, November 3, 2022 at 11:59 PM. *Please note: Early applications are encouraged. Applications will be disqualified if not received by the deadline and/or the qualifications/proposal do not meet the criteria.

Two ways to submit an application and proposal:

1. Email application packet to: Liz Elliott

2. Submit the application packet in-person at the Shannon Community Center; Attention: Liz Elliott, 11600 Shannon Avenue, Dublin, CA 94568.

**D. Presentation (limited to five minutes)**

Selected applicants will be notified on Wednesday, November 9, 2022 to present their proposal at the Youth Advisory Committee Special Meeting on Wednesday, November 16, 2022, at 7:00 p.m. at The Dublin Senior Center. A youth member or members, along with the adult sponsor of the organization or club, must conduct the presentation.

**Name of Organization/Club:***

DubMed

**Address1***

[redacted]

**City***

Dublin

**State***

CA

**Zip***

94568

**Phone:***

[redacted]

**Primary Contact Person (Name & Title):***

Claire Song; Co Editor-in-Chief

**Phone:***

[redacted]

**Email:***

[redacted]

**Adult Sponsor (Name & Title):***

Anne Ha; Dublin High School Teacher

**Phone: ***

[redacted]

**Email:***

[redacted]

**Amount Requesting:***

$500

**Number of People in Organization:***

28

**Percent of Dublin Youth Participants:***

100%

**Did the Youth Organization/Club receive grant funding in the past?***

- ○ Yes
- ◉ No

**If yes, please explain how the funding from the Youth Mini Grants was used; if the goals were met; and the impact on the program.**

**I have reviewed the proposal, and to the best of my knowledge, the funds requested from the City of Dublin will be used to provide the services described in this Request for Proposal. I also attest that the above-named organization/club have not received a grant from the City of Dublin within the past year.**

**Adult Sponsor's Acknowledgement ***

Anne Ha

**Date: ***

10/28/2022

**DubMed 2022 Youth Mini Grant Request**

**A brief description of your organization.**

DubMed is a medical magazine founded by students at Dublin High school who want to tackle the issue of accessibility in STEM. In scientific literature today, the concepts and vocabulary used to describe these topics make it extremely difficult for the general public to understand. Our mission is to create magazines targeting interesting health topics and discoveries that will be both more comprehensible and accessible to accommodate a more diverse group of people. We believe that health education should be open to people regardless of their educational background, because advancement is not made through the intelligence of solely one individual but begins through the contribution of a whole community. We have already developed 2 full editions, which were presented at HOSA's (Future Health Professionals) Health Education event, and placed third overall in the California state.

**Describe the project and how it will benefit Dublin youth.**

There are many exciting discoveries and research within the health or science fields, yet due to its limited accessibility, many are unaware of these topics. Ultimately, our goal is to create both an informative and comprehensible medical magazine that will allow for high school students to be acquainted with ongoing medical issues as well as novel research. The more knowledgeable our community is about health issues, the more we can improve the quality of life on a day to day basis. Students will also be encouraged to join the effort, with opportunities to spread their health knowledge in the magazine. We also hope to get rid of the notion that you must use difficult vocabulary or grammar in order to sound professional. No matter how "informal" the

language, if it is able to create change and impact the audience, it is still an influential piece of writing that should be acknowledged.

Every month, we focus on a different topic that targets a different subject; for example, one of our editions last year focused on mental health. For the month of November this year, we will be focusing on Sports Health. Many Dublin youths participate in a sport, and it is important to emphasize the health risks related with playing these sports. Not only does our magazine provide a platform for students interested in STEM to write, but it also directly tackles issues that are most important to teenagers today.

**Describe what and how the funds/grant will be used.**

The funds will be used to print the magazines themselves, so that physical copies of the magazine can be distributed. Using the supplier MGX Print, around 100 copies will result in ~$180, around $1.80 per magazine. This number may slightly shift depending on the number of pages within the magazine when it is in its finalized stages. We are planning on developing 3 editions this school year, and the number of magazines printed will be around 100 for each edition. Any leftover funds will be saved for the next edition, or for the next school year. We are requesting a total of $500 to begin printing 2 editions this school year.

**Explain what proof will be given to the Youth Advisory Committee that funds were used as proposed.**

A receipt of the transaction will be provided to the Youth Advisory Committee, as well as a copy of the physical magazine to prove the funds were used as proposed.

# Print

# City of Dublin Youth Advisory Committee - 2022 Youth Mini Grant Application - Submission #5377

**Date Submitted: 11/2/2022**

## Youth Advisory Committee - Youth Mini Grant Request for Proposals

**General Information:**

**A. Qualifications:**

1. Youth benefiting from or involved with the project must include at least 75% Dublin residents who are of middle or high school age.

2. Organization/Club must have an adult sponsor.

3. Organization/Club must be based within the City of Dublin.

**B. Proposal:**

The proposal must be no longer than two-and-a-half pages, double-spaced. The proposal should include the following:

1. A brief description of your organization.

2. Describe the project and how it will benefit Dublin youth.

3. Describe what and how the funds/grant will be used.

4. Explain what proof will be given to the Youth Advisory Committee that funds were used as proposed.

5. Should a grant have been awarded in the past to the same organization, a brief review of how the money was spent and how it benefitted the group needs to be highlighted in this year's presentation.

**C. Submission:**

The application and proposal will be accepted beginning Monday, October 3, 2022 at 8:00 AM., through Thursday, November 3, 2022 at 11:59 PM. *Please note: Early applications are encouraged. Applications will be disqualified if not received by the deadline and/or the qualifications/proposal do not meet the criteria.

Two ways to submit an application and proposal:

1. Email application packet to: Liz Elliott

2. Submit the application packet in-person at the Shannon Community Center; Attention: Liz Elliott, 11600 Shannon Avenue, Dublin, CA 94568.

**D. Presentation (limited to five minutes)**

Selected applicants will be notified on Wednesday, November 9, 2022 to present their proposal at the Youth Advisory Committee Special Meeting on Wednesday, November 16, 2022, at 7:00 p.m. at The Dublin Senior Center. A youth member or members, along with the adult sponsor of the organization or club, must conduct the presentation.

**Name of Organization/Club:***

Gardeners of the Galaxy

**Address1***

[redacted]

**City***

Dublin

**State***

California

**Zip***

94568

**Phone:***

[redacted]

**Primary Contact Person (Name & Title):***

Arjun Karur-Parekh

**Phone:***

[redacted]

**Email:***

[redacted]

**Adult Sponsor (Name & Title):***

Frank Castro, Child Nutrition DIrector, DUSD

**Phone: ***

[redacted]

**Email:***

[redacted]

**Amount Requesting:***

1500

**Number of People in Organization:***

5

**Percent of Dublin Youth Participants:***

100%

**Did the Youth Organization/Club receive grant funding in the past?***

- (●) Yes
- ( ) No

**If yes, please explain how the funding from the Youth Mini Grants was used; if the goals were met; and the impact on the program.**

We were proud to receive our first grant of $480 from the City of Dublin in 2020. We used those funds to donate over 85 trays (30 pounds) of sunflower microgreens and gave away over 500 sunflower seedlings during the food drive for people to grow in their backyards. 950 families in DUSD were fed chicken and vegetarian wraps made using our salad greens. We were awarded a $700 grant for the year 2021â€“2022, and in less than three months of operation, we were able to grow and distribute 115 trays (45 pounds of microgreens!). Over 3000 diets have been supplemented with this since early 2021.

**I have reviewed the proposal, and to the best of my knowledge, the funds requested from the City of Dublin will be used to provide the services described in this Request for Proposal. I also attest that the above-named organization/club have not received a grant from the City of Dublin within the past year.**

**Adult Sponsor's Acknowledgement ***

Frank Castro

**Date: ***

11/02/2022

[redacted]

[redacted]>

Dear Ms. Elliot and fellow YAC members,

I am emailing again as the previous email was sent by accident before the grant proposal was finalized. I hope you can disregard my first email and please consider the following. Thank you.

It is with much delight that I am reapplying for the youth grant for 2023.

My name is Arjun Karur-Parekh and I am a junior at Dublin High School. Since I began gardening in the fifth grade, I have founded a group called the "Gardeners of the Galaxy." Our goal is to cultivate and contribute healthy food options to the students of Dublin Unified School District, Tri-Valley Food Pantry, and anyone else in need. Food that is fresh, healthful, and reasonably priced is always needed. Our group had the pleasure of meeting that need by giving over 100 trays of pea microgreens to the DUSD during the previous academic year with the aid of the youth grant we received. With students back in school, the need for fresh affordable options is even higher this year and our group hopes to continue our efforts with the aid of another grant.

Growing microgreens will be the main emphasis of our group. It will consist of 3-5 who will grow the greens and deliver them to the DUSD school kitchens, as well as to Fertile Groundworks, a non-profit church organization that has volunteered to be our distributor to local food pantries. Adding microgreens to the menu will enhance the nutritional value because the nutrition density is up to 6 times greater than mature leafy greens. Our goal is to grow 5-10 pounds of microgreens a week. To meet all the safety standards, we have obtained a community producer license from the Alameda County of Environmental Services. In addition, Mr. Frank Castro, the director of nutritional services is our sponsor from the school district and has been an excellent supporter.

Funding is essential for this project's continuation since it will be necessary to purchase trays, soil, and seeds. Growing one tray costs

roughly $6.10  and can yield up to 16 servings!  By collaborating with local businesses, we hope to reduce the cost even further by bulk purchasing.

At specific checkpoints, photos will be taken to document how the money was utilized, and correct bookkeeping, i.e. Every harvest is weighed, photos taken at delivery, reliable databases, and there are treasury logs. To draw even more attention to our organization, a website with all project-related information will also be made.

We were proud to receive our first grant of $480 from the City of Dublin in 2020. We used those funds to donate over 85 trays (30 lbs) of sunflower microgreens and gave away over 500 sunflower seedlings during the food drive for people to grow in their backyards! 950 families in DUSD were fed chicken and vegetarian wraps made using our salad greens. We were awarded a $700 grant for the year 2021–2022, and in less than three months of operation, we were able to grow and distribute 115 trays  (45 pounds of microgreens!). Over 3000 diets have been supplemented with this since early 2021. We will be starting our growing earlier this year and hope to get at least 5 months of growth in. This would help to nearly double the amount of meals enhanced.

We genuinely wish to keep working hard. Securing the YAC's support will help with the expansion and reach of our club. All of us have been affected by the Covid-19 epidemic, but with innovative ideas and teamwork, we firmly think we can have a profound influence on our neighborhood.

Thank you again for supporting us and we look forward to hearing back from you.

Regards,

Arjun Karur-Parekh

[redacted]:

Dear Ms. Elliot

It is with much delight that I am reapplying for the youth grant for 2023.

My name is Arjun Karur-Parekh and I  am a junior at Dublin High school. I have been gardening since I was in 5th grade and have started an organization called the"Gardeners of the Galaxy ". Our goal is to grow and donate healthy food options to the students of  Dublin

Unified School District, Tri-Valley Food Pantry, and anyone else in need. By all means the COVID-19 pandemic is not  continues to evolve,  the need for fresh, healthy, affordable food remains constant and ever-present. Last school year, with the aid of the youth grant, our club had the pleasure of contributing to that need by donating over 100 trays of pea microgreens to the DUSD. With students back in school, the need for fresh affordable options is even higher this year and our group hopes to continue our efforts with the aid of another grant.

Our club will be primarily focusing on growing microgreens. It will consist of 3-5 who will be growing and delivering them to the DUSD school kitchens, as well as to Fertile Groundworks, a non-profit church organization that has volunteered to be our distributor to food pantries. Adding microgreens to the menu will enhance the nutritional value because the nutrition density is up to 6 times greater than mature leafy greens. Our goal is to grow 5-10 pounds of microgreens a week. To meet all the safety standards, we have obtained a community producer license from the Alameda County of Environmental Services. In addition Mr. Frank Castro, the director of nutritional services is our sponsor from the school district and has been an excellent supporter.

If we wish to sustain this project, funding is crucial and will be used to buy trays, soil, and seeds. The cost of growing 1 tray is about $6.10 which can yield up to 16 servings! By collaborating with local businesses, we hope to reduce the cost even further by bulk purchasing.

To prove that the funds are used as proposed, pictures will be taken at certain milestones and accurate bookkeeping will be initiated, ie. pictures taken at each delivery, weighing of product every harvest, accurate databases, and treasury logs. Additionally, a website with all information regarding the project will be created to get additional attention to our group.

We were proud to receive our first grant of $480 from the City of Dublin in 2020. We used those funds to donate over 85 trays of microgreens and gave away over 500 sunflower seedlings during the food drive for people to grow in their backyards! Those salad greens were used to enhance the nutritional value of chicken and vegetarian wraps which fed more than 950 families throughout DUSD! For the 2021/22 grant, we received $700 and with that, we were able to grow and donate 115 trays and almost 45 pounds in less than 3 months of operation. With this, we helped supplement over 2000 diets and about 3000 diets since early 2021. We will be starting our growing earlier this year and hope to get at least 5 months of growing in and this would help to nearly double the amount of meals enhanced.

We sincerely hope to continue our efforts and secure your support with this grant, so we can grow and support those in need. The Covid-19 pandemic has taken a toll on all of us and with creative ideas and working together, we truly believe we can make a huge impact on our community.

Thank you again for supporting us and we look forward to hearing back from you.

Regards,
Arjun

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

# Print

# City of Dublin Youth Advisory Committee - 2022 Youth Mini Grant Application - Submission #5378

**Date Submitted: 11/2/2022**

## Youth Advisory Committee - Youth Mini Grant Request for Proposals

**General Information:**

**A. Qualifications:**

1. Youth benefiting from or involved with the project must include at least 75% Dublin residents who are of middle or high school age.

2. Organization/Club must have an adult sponsor.

3. Organization/Club must be based within the City of Dublin.

**B. Proposal:**

The proposal must be no longer than two-and-a-half pages, double-spaced. The proposal should include the following:

1. A brief description of your organization.

2. Describe the project and how it will benefit Dublin youth.

3. Describe what and how the funds/grant will be used.

4. Explain what proof will be given to the Youth Advisory Committee that funds were used as proposed.

5. Should a grant have been awarded in the past to the same organization, a brief review of how the money was spent and how it benefitted the group needs to be highlighted in this year's presentation.

**C. Submission:**

The application and proposal will be accepted beginning Monday, October 3, 2022 at 8:00 AM., through Thursday, November 3, 2022 at 11:59 PM. *Please note: Early applications are encouraged. Applications will be disqualified if not received by the deadline and/or the qualifications/proposal do not meet the criteria.

Two ways to submit an application and proposal:

1. Email application packet to: Liz Elliott

2. Submit the application packet in-person at the Shannon Community Center; Attention: Liz Elliott, 11600 Shannon Avenue, Dublin, CA 94568.

**D. Presentation (limited to five minutes)**

Selected applicants will be notified on Wednesday, November 9, 2022 to present their proposal at the Youth Advisory Committee Special Meeting on Wednesday, November 16, 2022, at 7:00 p.m. at The Dublin Senior Center. A youth member or members, along with the adult sponsor of the organization or club, must conduct the presentation.

**Name of Organization/Club:***

SHAPE (Student Health Advocates for a Positive Environment)

**Address1***

[redacted]

**City***

Dublin

**State***

California

**Zip***

94568

**Phone:***

[redacted]

**Primary Contact Person (Name & Title):***

Ms. Laasya Balupari

**Phone:***

[redacted]

**Email:***

[redacted]

**Adult Sponsor (Name & Title):***

Ms. Eleana Brumage

**Phone: ***

[redacted]

**Email:***

[redacted]

**Amount Requesting:***

$350

**Number of People in Organization:***

32

**Percent of Dublin Youth Participants:***

100%

**Did the Youth Organization/Club receive grant funding in the past?***

- ( ) Yes
- (•) No

**If yes, please explain how the funding from the Youth Mini Grants was used; if the goals were met; and the impact on the program.**

**I have reviewed the proposal, and to the best of my knowledge, the funds requested from the City of Dublin will be used to provide the services described in this Request for Proposal. I also attest that the above-named organization/club have not received a grant from the City of Dublin within the past year.**

**Adult Sponsor's Acknowledgement ***

Eleana Brumage

**Date: ***

11/2/2022

Dear Dublin Youth Advisory Committee and the City of Dublin,

We are SHAPE (Student Health Advocates for a Positive Environment), a club at Dublin High School centered around community health and helping others live a healthier lifestyle. SHAPE was founded by two Dublin student athletes who realized that their needs and the needs of several other students were not being met. The catalyst? Seeing dozens of kids spending hours in the sun without sunscreen. Considering that skin cancer is the most common cancer in the US, sunscreen is a basic necessity to half one's risk of cancer and melanoma. We decided that we wanted to tackle this issue, and other ones such as menstrual disorders, homelessness, and water quality.

Our objective is to improve and support the health of all students on campus, as well as the community. Through the many projects we will complete, members will learn about the different issues students experience on campus. Projects will provide and implement solutions on campus, aiding hundreds students by giving them important resources and promoting healthier habits schoolwide, leading to a healthier student body.

We are incredibly focused on finding ways to make a loud, direct impact on our community. Our first project, funding sunscreen dispensers for our Sports Complex, will be positively impacting hundreds of different athletes: from soccer players, cross country runners, and sprinters, to tennis players, golfers, and swimmers. Simultaneously, we are also working on arranging guest speakers to talk about an issue we see present in our community, the Female Athlete Triad, which is a set of health issues common in female athletes that has directly caused several bone problems, mental health struggles, decreased athletic performance, and injuries for our athletes. These, along with scheduled projects to help the homeless this winter, stock

bathrooms with menstrual products, and make first aid more accessible, are ways we are impacting the Dublin student body.

We already conducted our first fundraiser by selling Halloween grams for students, but running our solutions requires more funding than we currently have. Although we have raised enough for the installation of sunscreen dispensers in the Sports Complex, funding from this grant will allow us to consistently refill the dispenser for the spring season, giving students and athletes daily access to this resource. Maintenance is estimated to be around $50 dollars a month for three months, serving over 200 student athletes. From there, we will also begin stocking other supplies, such as menstrual products. This winter we are going to run a series of knitting classes, where families all over Dublin can participate in knitting hats and scarves for local homeless shelters. Though the majority of this event will be fueled by volunteers, we have an estimated $50 cost for this workshop. This will require funding to provide participants with the necessary materials for knitting. Finally, we are prototyping water filtration systems throughout campus, making cleaner water available to students. We have noticed that students frequently complain about their poor water quality at school, with many choosing to be dehydrated over drinking the water provided. Since our advisor and school have extra materials that we can use, the cost for this project is around $30. Other workshops and guest speakers are also planning to be run.

As proof of proper handling of funds, SHAPE is dedicated to tracking our earnings, spendings, and other transactions. We keep all this information in our club records, as well as keep receipts of any purchases the club makes. This information will be consistently updated and shared with the Youth Advisory Committee. All files and treasury information is maintained on a Google Drive Folder, which will be shared with the YAC, and pictures of events are posted on

our social media. At the end of the year, SHAPE is willing to hold a meeting/presentation with the YAC to discuss the outcomes of the club and the usage of the funds.

Thank you for considering our request, and we hope you support our mission to create a healthier community in Dublin.

Sincerely,

Laasya Balupari and Isha Mittal

Co-Presidents of SHAPE @ Dublin High

# Print

# City of Dublin Youth Advisory Committee - 2022 Youth Mini Grant Application - Submission #5373

**Date Submitted: 10/30/2022**

## Youth Advisory Committee - Youth Mini Grant Request for Proposals

**General Information:**

**A. Qualifications:**

1. Youth benefiting from or involved with the project must include at least 75% Dublin residents who are of middle or high school age.

2. Organization/Club must have an adult sponsor.

3. Organization/Club must be based within the City of Dublin.

**B. Proposal:**

The proposal must be no longer than two-and-a-half pages, double-spaced. The proposal should include the following:

1. A brief description of your organization.

2. Describe the project and how it will benefit Dublin youth.

3. Describe what and how the funds/grant will be used.

4. Explain what proof will be given to the Youth Advisory Committee that funds were used as proposed.

5. Should a grant have been awarded in the past to the same organization, a brief review of how the money was spent and how it benefitted the group needs to be highlighted in this year's presentation.

**C. Submission:**

The application and proposal will be accepted beginning Monday, October 3, 2022 at 8:00 AM., through Thursday, November 3, 2022 at 11:59 PM. *Please note: Early applications are encouraged. Applications will be disqualified if not received by the deadline and/or the qualifications/proposal do not meet the criteria.

Two ways to submit an application and proposal:

1. Email application packet to: Liz Elliott

2. Submit the application packet in-person at the Shannon Community Center; Attention: Liz Elliott, 11600 Shannon Avenue, Dublin, CA 94568.

**D. Presentation (limited to five minutes)**

Selected applicants will be notified on Wednesday, November 9, 2022 to present their proposal at the Youth Advisory Committee Special Meeting on Wednesday, November 16, 2022, at 7:00 p.m. at The Dublin Senior Center. A youth member or members, along with the adult sponsor of the organization or club, must conduct the presentation.

**Name of Organization/Club:***

Teens Unite for Education

**Address1***

[redacted]

**City***

Dublin

**State***

Ca

**Zip***

94568

**Phone:***

[redacted]

**Primary Contact Person (Name & Title):***

Saiesha Goel; President

**Phone:***

[redacted]

**Email:***

[redacted]

**Adult Sponsor (Name & Title):***

Shamila Yaqub; Advisor

**Phone: ***

[redacted]

**Email:***

[redacted]

**Amount Requesting:***

$500

**Number of People in Organization:***

30

**Percent of Dublin Youth Participants:***

100%

**Did the Youth Organization/Club receive grant funding in the past?***

- (•) Yes
- ( ) No

**If yes, please explain how the funding from the Youth Mini Grants was used; if the goals were met; and the impact on the program.**

Using the funds provided to us from the Youth Mini Grant, we were able to provide 70+ students with backpacks and the materials they need to succeed. This year our goal is to impact at least 90+ students.

**I have reviewed the proposal, and to the best of my knowledge, the funds requested from the City of Dublin will be used to provide the services described in this Request for Proposal. I also attest that the above-named organization/club have not received a grant from the City of Dublin within the past year.**

**Adult Sponsor's Acknowledgement ***

Shamaila Yaqub

**Date: ***

10/30/22

**Teens Unite For Education Mini Grant Proposal**

Dear Youth Advisory Committee Members,

My name is Saiesha Goel and I am the President of Teens Unite For Education at Dublin High School. This club was founded in 2017 by Shaina Goel. The members of our club are students from four grade levels at Dublin High School. The mission of our club is to provide necessary resources to kids in low income families which will allow them to succeed and thrive in their educational journey. This year, our aim is to provide backpacks and school supplies to all students at a local low-income preschool, Kidango. Kidango is located in West Dublin right next to Dublin High School. Many people think that people who live in Dublin are financially well off, but this isn't always the case. Therefore, we would like to give back to our local community and help those in need. By donating to people who may not be able to afford the necessary supplies for their children, we are supporting our future generation strive towards their desired goals. We plan to donate backpacks, notebooks, writing utensils, erasers, rulers, small non-perishable snacks, etc. In the past years, we have also donated $200+ to a nonprofit organization called Yours Humanly. Yours Humanly has a similar goal as us, they help kids in low-income housing,  all over the world, get a chance to receive the gift of education.

Although we hope to receive the grant to ensure that we continue to give back to our local community, we will also continue to fundraise throughout the year. We plan on partnering with teen hotspots like BobaX, T4, Panda Express, Ini Burger, Chipotle, etc. If we are granted the funds we are requesting, we will provide receipts to prove that we are using the money to buy the necessary supplies for the students. We will also include pictures of the dropoff and handing out the backpacks.

In the past, our club has graciously been granted donations by the Youth Advisory Mini Grant Committee. Each year, we have spent this money wisely and given children backpacks full of treats and school supplies. One year, we were able to fundraise additional funds which we used towards holding a nutritional class at Kidango. This class helped educate little kids and their families on the importance of nutrition and picking healthier snack options to keep them physically healthy.

Last year we used the grant money to buy backpacks, pencils, folders, pencil pouches, and more. At the end of the year, we delivered the backpacks full of supplies to Kidango, Dublin. Our donation helped these kids and their families be better prepared for their upcoming school year.

Thank you for your time and consideration,

Saiesha Goel

President of Teens Unite for Education

Agenda Item 4.3

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Approval of Plans and Specifications and Award of Contract to St. Francis Electric for the Citywide Signal Communications Upgrade - Conduit Installation for Future Fiber Interconnect on Dublin Boulevard Project, CIP No. ST0713

*Prepared by: Sai Midididdi, Associate Civil (Traffic) Engineer*

## EXECUTIVE SUMMARY:

The City Council will consider approving the plans and specifications and awarding a construction contract to St. Francis Electric for the Citywide Signal Communications Upgrade - Conduit Installation for Future Fiber Interconnect on Dublin Boulevard Project, CIP No. ST0713. The project will install a three-inch conduit on Dublin Boulevard between the Civic Center and San Ramon Road. This project is exempt under Section 15302 (Replacement and Reconstruction) of the CEQA Guidelines.

## STAFF RECOMMENDATION:

Adopt the **Resolution** Approving the Plans and Specifications and Awarding a Contract to St. Francis Electric for the Citywide Signal Communications Upgrade - Conduit Installation for Future Fiber Interconnect on Dublin Boulevard Project, CIP No. ST0713.

## FINANCIAL IMPACT:

The bid submitted by St. Francis Electric is $806,000. Since the project involves directional drilling and installation of a conduit under the sidewalk with the potential for utility conflicts, Staff recommends a construction contingency of $160,000 (about 20%) to facilitate change orders for unforeseen construction issues, bringing the total potential construction cost to $966,000. Sufficient funds are available in the approved budget for CIP No. ST0713.

## DESCRIPTION:

The 2022-2027 Capital Improvement Program (CIP) includes the Citywide Signal Communications Upgrade, CIP No. ST0713 (Attachment 2), which provides for a variety of upgrades to the City's signal communications infrastructure. The subject project, Conduit Installation for Future Fiber Interconnect on Dublin Boulevard, is part of the scope of CIP No. ST0713 and will install a three-inch conduit on Dublin Boulevard between the Civic Center and San Ramon Road. In a future phase, a fiber optic interconnect will be installed in the conduit, and all the intersections along Dublin Boulevard between the Civic Center and San Ramon Road will be upgraded to a faster, more reliable, and higher bandwidth network connection.

Bid Process and Results

The City of Dublin issued the bid package for the project on November 14, 2022. The bid package was made up of 10 base bid items. Three sealed bids with the base bid amounts of $806,000, $975,910, and $1,100,300 were received by the deadline of December 13, 2022. The lowest base bid of $806,000 was submitted by St. Francis Electric. A summary of the bids is provided as Attachment 3.

*Compliance with Community Workforce Agreement*

On January 11, 2022, the City Council approved a Community Workforce Agreement (CWA) with the Building and Construction Trades Council of Alameda County and its Affiliated Local Unions. The CWA is applicable to public works projects valued at over $1,000,000, ensures that there are no labor issues related to said projects, and bolsters local efforts to connect residents with careers in the building and construction trades. The CWA includes a Local Hire Goal where 20% of all hours on a project be worked by Local Residents, which are defined as individuals that reside within Alameda County or within a 15-mile radius of City limits. The CWA also requires contractors to hire one new apprentice for the first $1,000,000 of construction costs, and an additional new apprentice for every $5,000,000 of construction costs, based on the engineer's estimate. Apprentices must work a minimum of 10% of the total craft's work hours, but the CWA allows that apprentices may be deployed to another project to ensure the minimum number of hours are met.

Although the lowest bid is less than $1,000,000, the engineer's estimate for the project was between $900,000 and $1,000,000, so Staff worked with a consultant, Workforce Integrity and Training Solutions, to prepare bid documents that comply with the provisions of the CWA. The provisions include that responsive bidders and their subcontractors must provide an executed agreement to be bound to and by the CWA within 14 days after notice of award.

Recommendation

Staff reviewed the bid results, checked references and necessary licenses, and recommends that the City Council award the construction contract to St. Francis Electric as the lowest responsive and responsible bidder. St. Francis Electric did include an executed agreement to be bound to the CWA with their bid.

To facilitate the approval of change orders and avoid construction delays, Staff recommends that the City Manager or designee be authorized to approve change orders up to the contingency

amount of $160,000. With the award of the contract as Staff proposes, the total project construction cost could be $966,000, including a contingency amount of $160,000, funded by CIP No. ST0713.

Staff expects the construction phase of the project to begin in early 2023 and complete in spring 2023.

California Environmental Quality Act (CEQA)
This project is exempt under Section 15302 (Replacement and Reconstruction) of the CEQA Guidelines.

## STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

A copy of this Staff Report was sent to St. Francis Electric and Alameda County Transportation Commission's Independent Watchdog Committee. The City Council Agenda was posted.

## ATTACHMENTS:

1) Resolution Approving the Plans and Specifications and Awarding a Contract to St. Francis Electric for Citywide Signal Communications Upgrade - Conduit Installation for Future Fiber Interconnect on Dublin Boulevard Project, CIP No. ST0713
2) CIP No. ST0713
3) Bid Results

**RESOLUTION NO. XX - 23**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DUBLIN**

**APPROVING THE PLANS AND SPECIFICATIONS AND AWARDING A CONTRACT TO ST. FRANCIS ELECTRIC FOR THE CITYWIDE SIGNAL COMMUNICATIONS UPGRADE – CONDUIT INSTALLATION FOR FUTURE FIBER INTERCONNECT ON DUBLIN BOULEVARD, CIP NO. ST0713**

**WHEREAS,** the design team has completed the plans and specifications for the Citywide Signal Communications Upgrade – Conduit Installation for Future Fiber Interconnect on Dublin Boulevard Project, CIP No. ST0713, (Project), which includes the installation of a three-inch conduit and upgrading of pull boxes along Dublin Boulevard between City Hall and San Ramon Road; and

**WHEREAS,** the City of Dublin did, on December 13, 2022, publicly open, examine, and declare all sealed bids for doing the work described in the approved plans and specifications for the Project, which plans and specifications are hereby expressly referred to for a description of said work and for all particulars relative to the proceedings under the request for bids; and

**WHEREAS,** said bids were submitted to City Staff and St. Francis Electric was determined to be the lowest responsive and responsible bidder for doing said work.

**NOW, THEREFORE, BE IT RESOLVED** that the City Council of the City of Dublin hereby approves the Plans and Specifications for the Project.

**BE IT FURTHER RESOLVED** that the City Council of the City of Dublin does hereby award the Contract for the Project to the lowest responsive bidder, St. Francis Electric at a base bid amount of $806,000, the particulars of which bids are on file in the Office of the Public Works Director.

**BE IT FURTHER RESOLVED** that the City Council of the City of Dublin does hereby authorize the City Manager or designee to approve the Project contract change orders based on the appropriated funds designated for the Project up to the contingency amount of $160,000.

**BE IT FURTHER RESOLVED** that the City Manager or designee is authorized to execute the Construction Agreement with St. Francis Electric.

{Signatures on the following page}

**PASSED, APPROVED AND ADOPTED** this 10th day of January 2023, by the following vote:

**AYES**:

**NOES**:

**ABSENT**:

**ABSTAIN**:

_____
Mayor

**ATTEST**:

_____
City Clerk

**Number – ST0713** **CITYWIDE SIGNAL COMMUNICATIONS UPGRADE** **Program – STREETS**

## PROJECT DESCRIPTION

This project provides for the continued upgrades of the traffic signal communications system and includes the replacement of signal controllers, conflict monitors, and battery backup units, as well as managing ongoing signal operations of coordinated corridors. In Fiscal Years 2019-20 and 2020-21, the project further expanded the traffic communication network, connecting traffic signals on Fallon Road and Tassajara Road. The project will also provide for installing a new conduit, removing the existing copper communication cables and installing new fiber optic cables on Dublin Boulevard, which is anticipated to begin in fall 2022. The project will also expand the adaptive traffic signal system along key corridors and will connect existing and new public safety infrastructure, such as situational awareness cameras and automated license plate recognition cameras, to the high-speed fiber optic communications system.

The project updated the City of Dublin Travel Demand Forecasting Model to provide traffic flow projections on the arterial and collector roadways as well as analyzed future land use development proposals and transportation network changes in the City. In April 2021, the project resulted in City Council adopting a resolution establishing the California Environmental Quality Act (CEQA) transportation thresholds of significance for Vehicle Miles Traveled (VMT).

This project is partially funded with General Fund reserve designation for One Time Initiative - Capital. Potential other funding for this project may include Federal and State grants.

**ANNUAL OPERATING IMPACT**: None

**MANAGING DEPARTMENT:** Public Works

| | | | 2022-2027 CAPITAL IMPROVEMENT PROGRAM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ESTIMATED COSTS | PRIOR YEARS | 2021-2022 BUDGET | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | FUTURE YEARS | TOTALS |
| 9100 - Salaries & Benefits | $31,859 | $91,448 | $8,320 | $8,320 | $8,320 | | | | $148,267 |
| 9200 - Contract Services | $538,107 | $404,974 | $135,000 | $135,000 | $135,000 | | | | $1,348,081 |
| 9400 – Improvements | $675,083 | $1,998,115 | $291,720 | $91,720 | $131,720 | | | | $3,188,358 |
| 9500 – Miscellaneous | $4,900 | | | | | | | | $4,900 |
| 9600 - Equipment | | $5,120 | | | | | | | $5,120 |
| **TOTAL** | **$1,249,949** | **$2,499,657** | **$435,040** | **$235,040** | **$275,040** | | | | **$4,694,726** |

| FUNDING SOURCE | PRIOR YEARS | 2021-2022 BUDGET | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | FUTURE YEARS | TOTALS |
|---|---|---|---|---|---|---|---|---|---|
| 1001 - General Fund | $79,853 | $1,420,147 | | | | | | | $1,500,000 |
| 2201 - State Gas Tax | | $104,000 | | | | | | | $104,000 |
| 2204 - Measure B Sales Tax - Local Streets Fund (ACTC) | $175,550 | $73,090 | | | | | | | $248,640 |
| 2207 - TFCA/Transportation for Clean Air | | $146,000 | | | | | | | $146,000 |
| 2212 - Vehicle Registration Fee (ACTC) | $691,070 | $31,676 | $35,040 | $35,040 | $35,040 | | | | $827,866 |
| 2214 – Measure BB Sales Tax – Local Streets Fund (ACTC) | | | $200,000 | $200,000 | $200,000 | | | | $600,000 |
| 2220 - Road Maint. & Rehab. Account (RMRA) | $36,844 | $417,476 | $200,000 | | $40,000 | | | | $694,320 |
| 4301 – Eastern Dublin Transportation Impact Fee | $177,158 | $22,842 | | | | | | | $200,000 |
| 4304 - Western Dublin Transportation Impact Fee | | $199,000 | | | | | | | $199,000 |
| 6305 - Internal Service Fund - Equipment | $89,474 | $85,426 | | | | | | | $174,900 |
| **TOTAL** | **$1,249,949** | **$2,499,657** | **$435,040** | **$235,040** | **$275,040** | | | | **$4,694,726** |

| ANNUAL OPERATING IMPACT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

# CITY OF DUBLIN
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
BID SUMMARY

**Project Name:** Citywide Signal Communication Upgrade
Conduit Installation for Future Fiber Interconnect on Dublin Blvd
**Project No. :** ST 0713
**Bid Date:** December 13, 2022

| **BASE BID** | | | | **St. Francis Electric, LLC** | | **W. Bradley Electric, Inc** | | **Columbia Electric** | |
|---|---|---|---|---|---|---|---|---|---|
| **ITEM** | **DESCRIPTION** | **Qty.** | **UNIT** | **Unit Cost** | **Extension** | **Unit Cost** | **Extension** | **Unit Cost** | **Extension** |
| 1 | Mobilization (Max10% of the total base bid) | 1 | LS | $64,000.00 | $64,000.00 | $25,000.00 | $25,000.00 | $100,000.00 | $100,000.00 |
| 2 | Construction Area Traffic Control (Max 10% of the total base bid) | 1 | LS | $64,000.00 | $64,000.00 | $42,000.00 | $42,000.00 | $100,000.00 | $100,000.00 |
| 3 | Caltrans Permit | 1 | LS | $18,000.00 | $18,000.00 | $280.00 | $280.00 | $2,500.00 | $2,500.00 |
| 4 | Sheeting, Shoring, and Bracing | 1 | LS | $20,000.00 | $20,000.00 | $3,000.00 | $3,000.00 | $35,000.00 | $35,000.00 |
| 5 | Storm Water Pollution Prevention Plan | 1 | LS | $6,320.00 | $6,320.00 | $3,100.00 | $3,100.00 | $15,000.00 | $15,000.00 |
| 6 | 3" Schedule 40 HDPE Conduit | 5,990 | LF | $97.00 | $581,030.00 | $131.00 | $784,690.00 | $125.00 | $748,750.00 |
| 7 | Install Cabinet Riser | 3 | EA | $2,100.00 | $6,300.00 | $2,100.00 | $6,300.00 | $5,500.00 | $16,500.00 |
| 8 | Inspect Existing Conduit | 330 | LF | $20.00 | $6,600.00 | $28.00 | $9,240.00 | $35.00 | $11,550.00 |
| 9 | No. N48 Pull Box | 6 | EA | $3,600.00 | $21,600.00 | $7,150.00 | $42,900.00 | $4,500.00 | $27,000.00 |
| 10 | No. 6E Pull Box | 11 | EA | $1,650.00 | $18,150.00 | $5,400.00 | $59,400.00 | $4,000.00 | $44,000.00 |
| **TOTAL** | | | | | **$806,000.00** | | $975,910.00 | | $1,100,300.00 |
| | | | | **APPARENT LOW BIDDER** | | | | | |

## List of Sub-Contractors

| Description | St. Francis Electric, LLC | W. Bradley Electric, Inc | Columbia Electric |
|---|---|---|---|
| Directional Drilling | Pioneer Underground Construction | | |
| Excavate&Bore | | Tight Access Excavation Inc | |
| Traffic Control | | Farwest Safety Inc | |
| Civil | | Golden Bay Construction Inc | |
| Video Pipe Inspection | | GPRS | |
| C3 | | | SoCal Stormwater Runoff Solution Services, Inc |

Agenda Item 4.4

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Agreement for Water Slide Maintenance Services at The Wave
*Prepared by: Dustin Stene, Recreation Supervisor*

### EXECUTIVE SUMMARY:

The City Council will consider an agreement with Slide Guys Restoration Inc. for waterslide maintenance services at The Wave.

### STAFF RECOMMENDATION:

Adopt the **Resolution** Approving an Agreement with Slide Guys Restoration Inc. for Waterslide Maintenance Services and approve the budget change.

### FINANCIAL IMPACT:

The agreement with Slide Guys Restoration Inc. is not to exceed $151,620 per calendar year, which includes $126,350 for regular maintenance and inspections, plus a 20% contingency of $25,270 for additional repairs as needed. Approval of the agreement will require a $37,593 budget increase funded by the General Fund Undesignated Reserve. Funding for the subsequent years will be included in future budget processes.

### DESCRIPTION:

In prior years, The Wave pool and waterslide maintenance agreements were combined; however, due to the unique experience, skill set, and certifications required to maintain waterslides, a separate Request for Proposals (RFP) for waterslide maintenance was released on November 2, 2022. Slide Guys Restoration Inc. submitted the lowest responsive bid and their proposal aligns with the City's needs. Other bids were received from Safe Slide Restoration and White Water.

Slide Guys Restoration Inc. is highly recommended by multiple agencies, two of which are in California, which gives them experience with the Occupational Safety and Health Administration (OSHA) regulations for California amusement rides. Slide Guys Restoration Inc. also meets

certification requirements for rope access safety and fiberglass repair. Slide Guys Restoration Inc. will be required to conduct a bi-annual service that includes fiberglass, chip and cracking, and gel coat repair, as well as joint caulking and the wax and polish of all slides.

Staff is recommending a three-year service agreement for water slide maintenance with Slide Guys Restoration Inc., expiring on December 31, 2025, with the option of two, one-year extensions. The cost detail is summarized in the table below.

**Table 1: Slide Guys Restoration Inc. Cost Detail**

| | |
|---|---|
| **Pre-Summer Service and Inspection** | $63,175 |
| **Post-Summer Service and Inspection** | $63,175 |
| **Contingency 20%** | $25,270 |
| **Total Cost** | **$151,620** |

## STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

A copy of the Staff Report was provided to Slide Guys Restoration Inc., and the City Council Agenda was posted.

## ATTACHMENTS:

1) Resolution Approving an Agreement with Slide Guys Restoration Inc. for Waterslide Maintenance Services
2) Exhibit A to the Resolution - Agreement Between the City of Dublin and Slide Guys Restoration Inc.
3) Proposal - Slide Guys Restoration Inc.
4) Request for Proposals
5) Budget Change Form

**RESOLUTION NO. XX - XX**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DUBLIN**

**APPROVING AN AGREEMENT WITH SLIDE GUYS RESTORATION INC. FOR WATERSLIDE MAINTENANCE SERVICES**

**WHEREAS,** Staff issued a Request for Proposals for waterslide maintenance services at The Wave; and

**WHEREAS,** Slide Guys Restoration Inc. emerged as the most cost effective company, and aligns with the City's needs for biannual waterslide maintenance services; and

**WHEREAS,** Slide Guys Restoration Inc. is highly recommended by multiple agencies; and is prepared to complete the work outlined in the Scope of Services.

**NOW, THEREFORE BE IT RESOLVED,** the City Council of the City of Dublin does hereby approve the agreement with Slide Guys Restoration Inc., attached hereto as **Exhibit A** in an amount not to exceed $454,860 through December 31, 2025.

**BE IT FURTHER RESOLVED** that the City Manager is authorized to execute the agreement, and make any necessary, non-substantive changes to carry out the intent of this Resolution.

**PASSED, APPROVED AND ADOPTED** this 10th day of January 2023, by the following vote:

**AYES**:

**NOES**:

**ABSENT**:

**ABSTAIN**:

_____
Mayor

**ATTEST**:

_____
City Clerk

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**CONTRACTOR SERVICES AGREEMENT BETWEEN
THE CITY OF DUBLIN AND
SLIDE GUYS RESTORATION, INC.**

THIS AGREEMENT for Waterslide Maintenance Services is made by and between the City of Dublin ("City") and Slide Guys Restoration, Inc. ("Contractor") (together sometimes referred to as the "Parties") as of January 10, 2023 (the "Effective Date").

**Section 1. SERVICES.** Subject to the terms and conditions set forth in this Agreement, Contractor shall provide to City the services described in the Scope of Work attached as Exhibit A at the time and place and in the manner specified therein. In the event of a conflict in or inconsistency between the terms of this Agreement and Exhibit A, the Agreement shall prevail.

**1.1 Term of Services.** The term of this Agreement shall begin on the Effective Date and shall end on December 31, 2025, and Contractor shall complete the work described in Exhibit A on or before that date, unless the term of the Agreement is otherwise terminated or extended, as provided for in Section 8. The time provided to Contractor to complete the services required by this Agreement shall not affect the City's right to terminate the Agreement, as referenced in Section 8. Notwithstanding the foregoing this Agreement may be extended for up to two (2) additional one (1) year terms, upon the written consent of the Contractor and the City Manager, provided that: a) sufficient funds have been appropriated for such purchase, b) the price charged by the Contractor for the provision of the services described in Exhibit A does not increase. None of the foregoing shall affect the City's right to terminate the Agreement as provided for in Section 8.

**1.2 Standard of Performance.** Contractor shall perform all services required pursuant to this Agreement in the manner and according to the standards observed by a competent practitioner of the profession in which Contractor is engaged.

**1.3 Assignment of Personnel.** Contractor shall assign only competent personnel to perform services pursuant to this Agreement. In the event that City, in its sole discretion, at any time during the term of this Agreement, desires the reassignment of any such persons, Contractor shall, immediately upon receiving notice from City of such desire of City, reassign such person or persons.

**1.4 Time.** Contractor shall devote such time to the performance of services pursuant to this Agreement as may be reasonably necessary to meet the standard of performance provided in Subsection 1.2 above and to satisfy Contractor's obligations hereunder.

**1.5 Public Works Contractor Registration**. Because the services described in Exhibit A constitute a public works within the definition of Section 1720(a)(1) and 1771 of the California Labor Code, Contractor is required to comply with the provisions of the California Labor Code applicable to public works, to the extent set forth in Exhibit C.

**1.6 Public Works Contractor Registration**. Contractor agrees, in accordance with Section 1771.1 of the California Labor Code, that Contractor or any subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104

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of the Public Contract Code, or engage in the performance of any contract for public work, as defined in Chapter 1 of Part 7 of Division 2 of the California Labor Code, unless currently registered and qualified to perform public work pursuant to California Labor Code section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded. No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to California Labor Code section 1725.5. Contractor agrees, in accordance with Section 1771.4 of the California Labor Code, that if the work under this Agreement qualifies as public work, it is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

**Section 2. COMPENSATION.** City hereby agrees to pay Contractor, pursuant to the Compensation Schedule attached as Exhibit B, a sum not to exceed $454,860 notwithstanding any contrary indications that may be contained in Contractor's proposal, for services to be performed under this Agreement. In the event of a conflict between this Agreement and Contractor's proposal regarding the amount of compensation, the Agreement shall prevail. City shall pay Contractor for services rendered pursuant to this Agreement at the time and in the manner set forth herein. The payments specified below shall be the only payments from City to Contractor for services rendered pursuant to this Agreement. Contractor shall submit all invoices to City in the manner specified herein. Except as specifically authorized by City in writing, Contractor shall not bill City for duplicate services performed by more than one person.

Contractor and City acknowledge and agree that compensation paid by City to Contractor under this Agreement is based upon Contractor's estimated costs of providing the services required hereunder, including salaries and benefits of employees and subcontractors of Contractor. Consequently, the Parties further agree that compensation hereunder is intended to include the costs of contributions to any pensions and/or annuities to which Contractor and its employees, agents, and subcontractors may be eligible. City therefore has no responsibility for such contributions beyond compensation required under this Agreement.

**2.1 Invoices.** Contractor shall submit invoices, not more often than once a month during the term of this Agreement, based on the cost for services performed prior to the invoice date. No individual performing work under this Agreement shall bill more than 2,000 hours in a fiscal year unless approved, in writing, by the City Manager or his/her designee. Invoices shall contain the following information:

- Serial identifications of progress bills; i.e., Progress Bill No. 1 for the first invoice, etc.;
- The beginning and ending dates of the billing period;
- A Task Summary containing the original contract amount, the amount of prior billings, the total due this period, the balance available under the Agreement, and the percentage of completion;
- A copy of the applicable time entries or time sheets shall be submitted showing the following:

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- Daily logs of total hours worked by each individual performing work under this Agreement
- Hours must be logged in increments of tenths of an hour or quarter hour
- If this Agreement covers multiple projects, all hours must also be logged by project assignment
- A brief description of the work

- The total number of hours of work performed under the Agreement by Contractor and each employee, agent, and subcontractor of Contractor performing services hereunder;

- The Contractor's signature;

- Contractor shall give separate notice to the City when the total number of hours worked by Contractor and any individual employee, agent, or subcontractor of Contractor reaches or exceeds 800 hours within a 12-month period under this Agreement and any other agreement between Contractor and City. Such notice shall include an estimate of the time necessary to complete work described in Exhibit A and the estimate of time necessary to complete work under any other agreement between Contractor and City, if applicable.

**2.2** **Monthly Payment.** City shall make monthly payments, based on invoices received, for services satisfactorily performed. City shall have 30 days from the receipt of an invoice that complies with all of the requirements above to pay Contractor.

**2.3** **Final Payment.** City shall pay the last 10% of the total sum due pursuant to this Agreement within 60 days after completion of the services and submittal to City of a final invoice, if all services required have been satisfactorily performed.

**2.4** **Total Payment.** City shall pay for the services to be rendered by Contractor pursuant to this Agreement. City shall not pay any additional sum for any expense or cost whatsoever incurred by Contractor in rendering services pursuant to this Agreement. City shall make no payment for any extra, further, or additional service pursuant to this Agreement.

In no event shall Contractor submit any invoice for an amount in excess of the maximum amount of compensation provided above either for a task or for the entire Agreement, unless the Agreement is modified prior to the submission of such an invoice by a properly executed change order or amendment.

**2.5** **Hourly Fees.** Fees for work performed by Contractor on an hourly basis shall not exceed the amounts shown on the compensation schedule attached hereto as Exhibit B.

**2.6** **[Intentionally Deleted]**.

**2.7** **Payment of Taxes.** Contractor is solely responsible for the payment of employment taxes incurred under this Agreement and any similar federal or state taxes.

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**2.8** **Payment upon Termination.** In the event that the City or Contractor terminates this Agreement pursuant to Section 8, the City shall compensate the Contractor for all outstanding costs incurred for work satisfactorily completed as of the date of written notice of termination. Contractor shall maintain adequate logs and timesheets to verify costs incurred to that date.

**2.9** **Authorization to Perform Services.** The Contractor is not authorized to perform any services or incur any costs whatsoever under the terms of this Agreement until receipt of authorization from the Contract Administrator.

**2.10** **[Intentionally Deleted]**.

**Section 3. FACILITIES AND EQUIPMENT.** Except as set forth herein, Contractor shall, at its sole cost and expense, provide all facilities and equipment that may be necessary to perform the services required by this Agreement. City shall make available to Contractor only the facilities and equipment listed in this section, and only under the terms and conditions set forth herein. Contractor shall make a written request to City to use facilities or equipment not otherwise listed herein.

**The Wave Aquatic Facility**

**3.1** **Safety Requirements.** In accordance with generally accepted construction practices and state law, Contractor shall be solely and completely responsible for conditions on the jobsite, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours.

Contractor shall take all necessary precautions and provide all necessary safeguards to prevent personal injury and property damage. Contractor shall provide protection for all persons including, but not limited to, its employees and employees of its subcontractors; members of the public; and employees, agents, and representatives of the City and regulatory agencies that may be on or about the work.

The services of the City in conducting review and inspection of Contractor's performance is not intended to include review of the adequacy of Contractor's work methods, equipment, bracing or scaffolding, or safety measures, in, on, or near any Contractor jobsite.

All work and materials shall be in strict accordance with all applicable state, city, county, and federal rules, regulations and codes, with specific attention to the United States Department of Labor Occupational Health and Safety Administration (OSHA) requirements. Contractor shall be solely responsible for compliance with all city, county, and state explosive transport, storage, and blasting requirements and for any damages caused by such operations.

Contractor is hereby informed that work on City property could be hazardous. Contractor shall carefully instruct all personnel working on City property that all conditions of the property are potentially hazardous work areas as to potential dangers and shall provide such necessary safety equipment and instructions as are necessary to prevent injury to

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personnel and damage to property. Special care shall be exercised relative to work underground.

In addition to complying with all other safety regulations, Contractor shall abide by any and all other City requirements contained in any specifications, special conditions or manuals, which shall be made available by City upon request.

Contractor shall provide and maintain all necessary safety equipment such as fences, barriers, signs, lights, walkways, guards, and fire prevention and fire-fighting equipment and shall take such other action as is required to fulfill its obligations under this section. It is the intent of the City to provide a safe working environment under normal conditions. CONTRACTOR IS ADVISED THAT CITY'S OPERATIONS AND PROPERTY ARE INHERENTLY HAZARDOUS BECAUSE OF CONDITIONS SUCH AS CONFINED SPACES, POTENTIALLY EXPLOSIVE ATMOSPHERES, AND POSSIBLE EXPOSURE TO PATHOGENS.

Contractor shall maintain all portions of the jobsite in a neat, clean, and sanitary condition at all times. If required by the City, toilets shall be furnished by Contractor where needed for use of its employees and their use shall be strictly enforced. Contractor shall not use the City's existing sanitary facilities, unless previously authorized by the City.

Contractor shall keep adequate first aid facilities and supplies available and instruction in first aid for its employees shall be given.

City reserves the right to require that Contractor bring onto the project or engage the services of a licensed safety engineer at any time during the term of this Agreement. If Contractor does not have a licensed safety engineer on staff, then City may require that Contractor engage a subcontractor or subconsultant as the project's safety engineer. Contractor shall bear all costs in connection with meeting the requirements of this section.

**Section 4. INSURANCE REQUIREMENTS.** Before fully executing this Agreement, Contractor, at its own cost and expense, unless otherwise specified below, shall procure the types and amounts of insurance listed below against claims for injuries to persons or damages to property that may arise from or in connection with the performance of the work hereunder by the Contractor and its agents, representatives, employees, and subcontractors. Consistent with the following provisions, Contractor shall provide proof satisfactory to City of such insurance that meets the requirements of this section and under forms of insurance satisfactory in all respects, and that such insurance is in effect prior to beginning work. Contractor shall maintain the insurance policies required by this section throughout the term of this Agreement. The cost of such insurance shall be included in the Contractor's bid. Contractor shall not allow any subcontractor to commence work on any subcontract until Contractor has obtained all insurance required herein for the subcontractor(s) and provided evidence to City that such insurance is in effect. VERIFICATION OF THE REQUIRED INSURANCE SHALL BE SUBMITTED AND MADE PART OF THIS AGREEMENT PRIOR TO EXECUTION. Contractor shall maintain all required insurance listed herein for the duration of this Agreement.

**4.1 Workers' Compensation.**

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**4.1.1 General Requirements.** Contractor shall, at its sole cost and expense, maintain Statutory Workers' Compensation Insurance and Employer's Liability Insurance for any and all persons employed directly or indirectly by Contractor. The Statutory Workers' Compensation Insurance and Employer's Liability Insurance shall be provided with limits of not less than $1,000,000 per accident. In the alternative, Contractor may rely on a self-insurance program to meet these requirements, but only if the program of self-insurance complies fully with the provisions of the California Labor Code. Determination of whether a self-insurance program meets the standards of the California Labor Code shall be solely in the discretion of the Contract Administrator.

The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the City for all work performed by the Contractor, its employees, agents, and subcontractors.

**4.1.2 Submittal Requirements.** To comply with Subsection 4.1, Contractor shall submit the following:

a. Certificate of Workers' Compensation Insurance in the amounts specified in the section; and
b. Waiver of Subrogation Endorsement as required by the section.

**4.2 Commercial General and Automobile Liability Insurance.**

**4.2.1 General Requirements.** Contractor, at its own cost and expense, shall maintain commercial general liability insurance for the term of this Agreement in an amount not less than $2,000,000 and automobile liability insurance for the term of this Agreement in an amount not less than $2,000,000 per occurrence, combined single limit coverage for risks associated with the work contemplated by this Agreement. If a Commercial General Liability Insurance or an Automobile Liability form or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to the work to be performed under this Agreement or the general aggregate limit shall be at least twice the required occurrence limit. Such coverage shall include but shall not be limited to, protection against claims arising from bodily and personal injury, including death resulting therefrom, and damage to property resulting from activities contemplated under this Agreement, including without limitation, blanket contractual liability and the use of owned and non-owned automobiles.

**4.2.2 Minimum Scope of Coverage.** Commercial general coverage shall be at least as broad as Insurance Services Office Commercial General Liability occurrence form CG 0001 (most recent edition) covering comprehensive General Liability on an "occurrence" basis. Automobile coverage shall be at least as broad as Insurance Services Office Automobile Liability form CA 0001, Code 1 (any auto). No endorsement shall be attached limiting the coverage.

**4.2.3 Additional Requirements.** Each of the following shall be included in the insurance coverage or added as a certified endorsement to the policy:

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a. The Insurance shall cover on an occurrence or an accident basis, and not on a claims-made basis.

b. City, its officers, officials, employees, and volunteers are to be covered as additional insureds as respects: liability arising out of work or operations performed by or on behalf of the Contractor; or automobiles owned, leased, hired, or borrowed by the Contractor.

c. Contractor hereby agrees to waive subrogation which any insurer or contractor may require from vendor by virtue of the payment of any loss. Contractor agrees to obtain any endorsements that may be necessary to affect this waiver of subrogation.

d. For any claims related to this Agreement or the work hereunder, the Contractor's insurance coverage shall be primary insurance as respects the City, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

**4.2.4 Submittal Requirements.** To comply with Subsection 4.2, Contractor shall submit the following:

a. Certificate of Liability Insurance in the amounts specified in the section;

b. Additional Insured Endorsement as required by the section;

c. Waiver of Subrogation Endorsement as required by the section; and

d. Primary Insurance Endorsement as required by the section.

**4.3 All Policies Requirements.**

**4.3.1 Acceptability of Insurers.** All insurance required by this section is to be placed with insurers with a Bests' rating of no less than A:VII.

**4.3.2 Verification of Coverage.** Prior to beginning any work under this Agreement, Contractor shall furnish City with complete copies of all Certificates of Liability Insurance delivered to Contractor by the insurer, including complete copies of all endorsements attached to the policies. All copies of Certificates of Liability Insurance and certified endorsements shall show the signature of a person authorized by that insurer to bind coverage on its behalf. If the City does not receive the required insurance documents prior to the Contractor beginning work, it shall not waive the Contractor's obligation to provide them. The City reserves the right to require complete copies of all required insurance policies at any time.

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**4.3.3** **Deductibles and Self-Insured Retentions.** Contractor shall disclose to and obtain the written approval of City for the self-insured retentions and deductibles before beginning any of the services or work called for by any term of this Agreement. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its officers, employees, and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

**4.3.4** **Wasting Policies.** No policy required by this Section 4 shall include a "wasting" policy limit (i.e. limit that is eroded by the cost of defense).

**4.3.5** **Endorsement Requirements.** Each insurance policy required by Section 4 shall be endorsed to state that coverage shall not be canceled by either party, except after 30 days' prior written notice has been provided to the City.

**4.3.6** **Subcontractors.** Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and certified endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

**4.4** **Remedies.** In addition to any other remedies City may have if Contractor fails to provide or maintain any insurance policies or policy endorsements to the extent and within the time herein required, City may, at its sole option exercise any of the following remedies, which are alternatives to other remedies City may have and are not the exclusive remedy for Contractor's breach:

- Obtain such insurance and deduct and retain the amount of the premiums for such insurance from any sums due under the Agreement;
- Order Contractor to stop work under this Agreement or withhold any payment that becomes due to Contractor hereunder, or both stop work and withhold any payment, until Contractor demonstrates compliance with the requirements hereof; and/or
- Terminate this Agreement.

**Section 5.** **INDEMNIFICATION AND CONTRACTOR'S RESPONSIBILITIES.** Contractor shall indemnify, defend with counsel acceptable to City, and hold harmless City and its officers, officials, employees, agents and volunteers from and against any and all liability, loss, damage, claims, expenses, and costs (including without limitation, attorney's fees and costs and fees of litigation) (collectively, "Liability") of every nature arising out of or in connection with Contractor's performance of the Services or its failure to comply with any of its obligations contained in this Agreement, except such Liability caused by the sole negligence or willful misconduct of City.

The Contractor's obligation to defend and indemnify shall not be excused because of the Contractor's inability to evaluate Liability or because the Contractor evaluates Liability and determines that the Contractor is not liable to the claimant. The Contractor must respond within 30 days, to the tender of any

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claim for defense and indemnity by the City, unless this time has been extended by the City. If the Contractor fails to accept or reject a tender of defense and indemnity within 30 days, in addition to any other remedy authorized by law, so much of the money due the Contractor under and by virtue of this Agreement as shall reasonably be considered necessary by the City, may be retained by the City until disposition has been made of the claim or suit for damages, or until the Contractor accepts or rejects the tender of defense, whichever occurs first.

Notwithstanding the forgoing, to the extent this Agreement is a "construction contract" as defined by California Civil Code Section 2782, as may be amended from time to time, such duties of Contractor to indemnify shall not apply when to do so would be prohibited by California Civil Code Section 2782.

In the event that Contractor or any employee, agent, or subcontractor of Contractor providing services under this Agreement is determined by a court of competent jurisdiction or the California Public Employees Retirement System (PERS) to be eligible for enrollment in PERS as an employee of City, Contractor shall indemnify, defend, and hold harmless City for the payment of any employee and/or employer contributions for PERS benefits on behalf of Contractor or its employees, agents, or subcontractors, as well as for the payment of any penalties and interest on such contributions, which would otherwise be the responsibility of City.

## Section 6. STATUS OF CONTRACTOR.

**6.1 Independent Contractor.** At all times during the term of this Agreement, Contractor shall be an independent contractor and shall not be an employee of City. This Agreement shall not be construed as an agreement for employment. City shall have the right to control Contractor only insofar as the results of Contractor's services rendered pursuant to this Agreement and assignment of personnel pursuant to Subsection 1.3; however, otherwise City shall not have the right to control the means by which Contractor accomplishes services rendered pursuant to this Agreement. Contractor further acknowledges that Contractor performs Services outside the usual course of the City's business; and is customarily engaged in an independently established trade, occupation, or business of the same nature as the Contractor performs for the City, and has the option to perform such work for other entities. Notwithstanding any other City, state, or federal policy, rule, regulation, law, or ordinance to the contrary, Contractor and any of its employees, agents, and subcontractors providing services under this Agreement shall not qualify for or become entitled to, and hereby agree to waive any and all claims to, any compensation, benefit, or any incident of employment by City, including but not limited to eligibility to enroll in the California Public Employees Retirement System (PERS) as an employee of City and entitlement to any contribution to be paid by City for employer contributions and/or employee contributions for PERS benefits.

**6.2 Contractor Not an Agent.** Except as City may specify in writing, Contractor shall have no authority, express or implied, to act on behalf of City in any capacity whatsoever as an agent. Contractor shall have no authority, express or implied, pursuant to this Agreement to bind City to any obligation whatsoever.

## Section 7. LEGAL REQUIREMENTS.

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**7.1** **Governing Law.** The laws of the State of California shall govern this Agreement.

**7.2** **Compliance with Applicable Laws.** Contractor and any subcontractors shall comply with all laws applicable to the performance of the work hereunder.

**7.3** **Other Governmental Regulations.** To the extent that this Agreement may be funded by fiscal assistance from another governmental entity, Contractor and any subcontractors shall comply with all applicable rules and regulations to which City is bound by the terms of such fiscal assistance program.

**7.4** **Licenses and Permits.** Contractor represents and warrants to City that Contractor and its employees, agents, and any subcontractors have all licenses, permits, qualifications, and approvals of whatsoever nature that are legally required to practice their respective professions. Contractor represents and warrants to City that Contractor and its employees, agents, any subcontractors shall, at their sole cost and expense, keep in effect at all times during the term of this Agreement any licenses, permits, and approvals that are legally required to practice their respective professions. In addition to the foregoing, Contractor and any subcontractors shall obtain and maintain during the term of this Agreement valid Business Licenses from City.

**7.5** **Nondiscrimination and Equal Opportunity.** Contractor shall not discriminate, on the basis of a person's race, sex, gender, religion (including religious dress and grooming practices), national origin, ancestry, physical or mental disability, medical condition (including cancer and genetic characteristics), marital status, age, sexual orientation, color, creed, pregnancy, genetic information, gender identity or expression, political affiliation or belief, military/veteran status, or any other classification protected by applicable local, state, or federal laws (each a "Protected Characteristic"), against any employee, applicant for employment, subcontractor, bidder for a subcontract, or participant in, recipient of, or applicant for any services or programs provided by Contractor under this Agreement.

Contractor shall include the provisions of this Subsection in any subcontract approved by the Contract Administrator or this Agreement.

## Section 8. TERMINATION AND MODIFICATION.

**8.1** **Termination.** City may cancel this Agreement at any time and without cause upon written notification to Contractor.

Contractor may cancel this Agreement upon 30 days' written notice to City and shall include in such notice the reasons for cancellation.

In the event of termination, Contractor shall be entitled to compensation for services performed to the effective date of termination; City, however, may condition payment of such compensation upon Contractor delivering to City any or all documents, photographs, computer software, video and audio tapes, and other materials provided to Contractor or prepared by or for Contractor or the City in connection with this Agreement.

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**8.2** **Extension.** City may, in its sole and exclusive discretion, extend the end date of this Agreement beyond that provided for in Subsection 1.1. Any such extension shall require a written amendment to this Agreement, as provided for herein. Contractor understands and agrees that, if City grants such an extension, City shall have no obligation to provide Contractor with compensation beyond the maximum amount provided for in this Agreement. Similarly, unless authorized by the Contract Administrator, City shall have no obligation to reimburse Contractor for any otherwise expenses incurred during the extension period.

**8.3** **Amendments.** The Parties may amend this Agreement only by a writing signed by all the Parties.

**8.4** **Assignment and Subcontracting.** City and Contractor recognize and agree that this Agreement contemplates personal performance by Contractor and is based upon a determination of Contractor's unique personal competence, experience, and specialized personal knowledge. Moreover, a substantial inducement to City for entering into this Agreement was and is the professional reputation and competence of Contractor. Contractor may not assign this Agreement or any interest therein without the prior written approval of the Contract Administrator. Contractor shall not subcontract any portion of the performance contemplated and provided for herein, other than to the subcontractors noted in the proposal, without prior written approval of the Contract Administrator.

**8.5** **Survival.** All obligations arising prior to the termination of this Agreement and all provisions of this Agreement allocating liability between City and Contractor shall survive the termination of this Agreement.

**8.6** **Options upon Breach by Contractor.** If Contractor materially breaches any of the terms of this Agreement, City's remedies shall include, but not be limited to, the following:

**8.6.1** Immediately terminate the Agreement;

**8.6.2** Retain the plans, specifications, drawings, reports, design documents, and any other work product prepared by Contractor pursuant to this Agreement;

**8.6.3** Retain a different contractor to complete the work described in Exhibit A not finished by Contractor; or

**8.6.4** Charge Contractor the difference between the cost to complete the work described in Exhibit A that is unfinished at the time of breach and the amount that City would have paid Contractor pursuant to Section 2 if Contractor had completed the work.

## Section 9. KEEPING AND STATUS OF RECORDS.

**9.1** **Records Created as Part of Contractor's Performance.** All reports, data, maps, models, charts, studies, surveys, photographs, memoranda, plans, studies, specifications, records, files, or any other documents or materials, in electronic or any other form, that Contractor prepares or obtains pursuant to this Agreement and that relate to the matters

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covered hereunder shall be the property of the City. Contractor hereby agrees to deliver those documents to the City upon termination of the Agreement. It is understood and agreed that the documents and other materials, including but not limited to those described above, prepared pursuant to this Agreement are prepared specifically for the City and are not necessarily suitable for any future or other use. City and Contractor agree that, until final approval by City, all data, plans, specifications, reports and other documents are confidential and will not be released to third parties without prior written consent of both Parties.

**9.2** **Contractor's Books and Records.** Contractor shall maintain any and all ledgers, books of account, invoices, vouchers, canceled checks, and other records or documents evidencing or relating to charges for services or expenditures and disbursements charged to the City under this Agreement for a minimum of 3 years, or for any longer period required by law, from the date of final payment to the Contractor to this Agreement.

**9.3** **Inspection and Audit of Records.** Any records or documents that Subsection 9.2 of this Agreement requires Contractor to maintain shall be made available for inspection, audit, and/or copying at any time during regular business hours, upon oral or written request of the City. Under California Government Code Section 8546.7, if the amount of public funds expended under this Agreement exceeds $10,000.00, the Agreement shall be subject to the examination and audit of the State Auditor, at the request of City or as part of any audit of the City, for a period of 3 years after final payment under the Agreement.

## Section 10. MISCELLANEOUS PROVISIONS.

**10.1** **Attorneys' Fees.** If a party to this Agreement brings any action, including an action for declaratory relief, to enforce or interpret the provision of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees in addition to any other relief to which that party may be entitled. The court may set such fees in the same action or in a separate action brought for that purpose.

**10.2** **Venue.** In the event that either party brings any action against the other under this Agreement, the Parties agree that trial of such action shall be vested exclusively in the state courts of California in the County of Alameda or in the United States District Court for the Northern District of California.

**10.3** **Severability.** If a court of competent jurisdiction finds or rules that any provision of this Agreement is invalid, void, or unenforceable, the provisions of this Agreement not so adjudged shall remain in full force and effect. The invalidity in whole or in part of any provision of this Agreement shall not void or affect the validity of any other provision of this Agreement.

**10.4** **No Implied Waiver of Breach.** The waiver of any breach of a specific provision of this Agreement does not constitute a waiver of any other breach of that term or any other term of this Agreement.

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**10.5** **Successors and Assigns.** The provisions of this Agreement shall inure to the benefit of and shall apply to and bind the successors and assigns of the Parties.

**10.6** **Conflict of Interest.** Contractor may serve other clients, but none whose activities within the corporate limits of City or whose business, regardless of location, would place Contractor in a "conflict of interest," as that term is defined in the Political Reform Act, codified at California Government Code Section 81000 *et seq.*

Contractor shall not employ any City official in the work performed pursuant to this Agreement. No officer or employee of City shall have any financial interest in this Agreement that would violate California Government Code Section 1090 *et seq.*

Contractor hereby warrants that it is not now, nor has it been in the previous 12 months, an employee, agent, appointee, or official of the City. If Contractor was an employee, agent, appointee, or official of the City in the previous 12 months, Contractor warrants that it did not participate in any manner in the forming of this Agreement. Contractor understands that, if this Agreement is made in violation of California Government Code Section 1090 *et seq.*, the entire Agreement is void and Contractor will not be entitled to any compensation for services performed pursuant to this Agreement, including reimbursement of expenses, and Contractor will be required to reimburse the City for any sums paid to the Contractor. Contractor understands that, in addition to the foregoing, it may be subject to criminal prosecution for a violation of California Government Code Section 1090 *et seq.*, and, if applicable, will be disqualified from holding public office in the State of California.

**10.7** **Solicitation.** Contractor agrees not to solicit business at any meeting, focus group, or interview related to this Agreement, either orally or through any written materials.

**10.8** **Contract Administration.** This Agreement shall be administered by the City Manager ("Contract Administrator"). All correspondence shall be directed to or through the Contract Administrator or his or her designee.

**10.9** **Notices.** Any written notice to Contractor shall be sent to:
Jordan Bakeman
4342 Old M51
Croswell, MI 48422

Any written notice to City shall be sent to:

City of Dublin
Attn: Dustin Stene
100 Civic Plaza
Dublin, CA 94568

**10.10** **Integration.** This Agreement, including the scope of work attached hereto and incorporated herein as Exhibits A, B, and C represents the entire and integrated agreement between City and Contractor and supersedes all prior negotiations, representations, or agreements, either written or oral.

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| | |
|---|---|
| Exhibit A | Scope of Services |
| Exhibit B | Compensation Schedule |
| Exhibit C | California Labor Code Section 1720 Information |

**10.11** **Counterparts and Electronic Signatures**. This Agreement may be executed in multiple counterparts, each of which shall be an original and all of which together shall constitute one agreement. Counterparts delivered and/or signatures executed by City-approved electronic or digital means shall have the same force and effect as the use of a manual signature. Both Parties desire this Agreement to be electronically signed in accordance with applicable federal and California law. Either Party may revoke its agreement to use electronic signatures at any time by giving notice to the other Party.

**10.12** **Certification per Iran Contracting Act of 2010.** In the event that this contract is for one million dollars ($1,000,000.00) or more, by Contractor's signature below Contractor certifies that Contractor, and any parent entities, subsidiaries, successors or subunits of Contractor are not identified on a list created pursuant to subdivision (b) of Section 2203 of the California Public Contract Code as a person engaging in investment activities in Iran as described in subdivision (a) of Section 2202.5, or as a person described in subdivision (b) of Section 2202.5 of the California Public Contract Code, as applicable.

**SIGNATURES ON FOLLOWING PAGE**

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The Parties have executed this Agreement as of the Effective Date. The persons whose signatures appear below certify that they are authorized to sign on behalf of the respective Party.

CITY OF DUBLIN

Linda Smith, City Manager

Attest:

Marsha Moore, City Clerk

Approved as to Form:

John Bakker, City Attorney

Slide Guys Restoration Inc.

DocuSigned by:
Jordan Bakeman
0129BA8EBB9140F...

Jordan Bakeman, Owner

Contractor's DIR Registration Number
(if applicable)

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# EXHIBIT A

## SCOPE OF SERVICES

WATERSLIDE TOWER

This biannual service requires inspection and preparation/repair of all waterslides prior to the California Occupational and Health Administration (OSHA) inspection that occurs annually each April and again after the conclusion of the water park season each of October. Contractors should be prepared to inspect the slides and structures for any damages or ware, and prepare slides for both the waterpark season opening and winter closure.

1. Preseason inspection and service must be completed by April 1 of each year.
2. Post season inspection and service must be completed by October 31 of each year.

To properly inspect, maintain and repair (if necessary) the two speed slides. Repelling will be required. To complete the repelling requirement, contractors must be emergency rope access certified and provide the certification to the City prior to performance of the project. Documentation for all repairs, including who made the repairs and the date, along with the scope of work should be submitted within five business days of repair.

3. Description
    a. Four Waterslides
        i. Slide A (Riptide Rider) – 251 ft
        ii. Slide B (Golden Wave) – 199 ft
        iii. Slide C (Mt. Diablue) – 245 ft
        iv. Slide D (Shamrock Swirl) – 71 ft
    b. Two Speed Slides (repelling work required)
        i. Slide E (Dublin Screamer Speed Slide) – 176 ft
        ii. Slide F (Emerald Plunge Speed Slide)– 154 ft
    c. Six Slide Runouts
4. Waterslide Maintenance Services
    a. Wax and inspect waterslides two times annually using "Stay Sealed" high gloss water slide protectant/sealant/wax to the complete surface of slide interior.
        i. Pre-season wax to be completed by April 1 of each year
        ii. End of season wax to be completed by October 31 of each year
        iii. Hand polish all slides as needed
        iv. High-pressure water wash (up to 4,000 p.s.i.) using biodegradable degreasing
            1. Agent and steam/hot water blast where necessary, to remove any grease, oil, loose paint, dirt and oxidation.

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b. Repair any joint caulking

c. Repair chip or cracking in gel coat

d. Repair any separating seams or seams with "rise" or "run"

i. Perform Semi-Annual and Annual Inspections according to WhiteWater Manual.

1. Semi-Annual Inspection to be completed by October 31 after waterpark operation concludes and an Annual Inspection including completed repairs to be finished by April 1, before waterpark operation begins.

2. The inspection checklist must be submitted within five business days after the inspection. This should include the date and names of inspectors, as well as their signatures signing off on the completed inspection.

3. Submit repair estimates for anything that needs to be repaired and returned to manufacturer standards.

4. Check all joint and provide an estimate for repairs of joints with partial, missing, or cracked caulking.

5. Check operation of interior nozzles for Slide D (Shamrock Swirl).

6. Other preventative maintenance including inspection of fiberglass for cracking, joint separation, or other concerns as related

7. Replace annual parts as indicated by WhiteWater on the Dublin Screamer drop slide (Slide E)

8. Send roller bar out for DPT testing per ASTM E147/E1417M

9. Replace filter cartridge (part 380188)

10. Replace 4 solenoid valves (part 342044)

11. Replace both bumpers (part 334849)

12. Replace rollers 2 (part 379987) and set screws 4 (part 379833)

13. Inspect drop slide air compressor and provide an estimate for repairs if needed

<u>Aquatic Play Structure (Splash Zone)</u>

Includes a WhiteWater Aqua Play structure and a variety of interactive play features. To properly inspect, maintain and repair the two children's waterslides with independent runouts. Documentation for all repairs that includes who made the repairs and the date, along with the scope of work should be submitted within five business days of repair.

1. Preseason service must be completed by the following dates April 1 of each year

2. Post season service must be completed by the following dates October 31 of each year

3. Description

a. Two Aqua Play Slides

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i. Slide G Tandem Slide – 14 ft

ii. Slide H Child's Tub Slide – 36 ft

b. Two independent runouts

4. Services

a. Wax waterslides two times annually using high gloss water slide protectant/sealant/wax to the complete surface of slide interior.

i. Pre-season wax to be completed by April 1, each year

ii. End of season wax to be completed by October 31, each year

iii. Hand polish both slides as needed

iv. High-pressure water wash (up to 4,000 p.s.i.) using biodegradable degreasing

1. Agent and steam/hot water blast where necessary, in order to remove any grease, oil, loose paint, dirt and oxidation.

v. Perform Semi-Annual and Annual Inspections according to WhiteWater Manual.

1. Semi-Annual Inspection to be completed by October 31 after waterpark operation concludes and the Annual Inspection to be completed by April 1, before waterpark operation begins.

2. The inspection checklist must be submitted within five business days after the inspection. This should include the date and names of inspectors, as well as their signatures signing off on the completed inspection.

3. Submit repair estimates for anything that needs to be repaired and returned to manufacturer standards.

4. Check all joint caulking and provide an estimate for repairs of joints with partial, missing, or cracked caulking.

5. Other preventative maintenance including inspection of fiberglass for cracking, joint separation, or other concerns as related

b. Repair any joint caulking

c. Repair chip or cracking in gel coat

d. Repair any separating seams or seams with "rise" or "run"

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# EXHIBIT B

## COMPENSATION SCHEDULE

| Biannual Slide Maintenance | Cost |
|---|---|
| Fall Maintenance Service | $63,175.00 |
| Spring Maintenance Service | $63,175.00 |
| Contingency | $25,270.00 |
| | **$151,620 per year** |

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# EXHIBIT C

## PROVISIONS REQUIRED FOR PUBLIC WORKS CONTRACTS PURSUANT TO CALIFORNIA LABOR CODE SECTION 1720 *ET SEQ.*

HOURS OF WORK:

A. In accordance with California Labor Code Section 1810, 8 hours of labor in performance of the services described in Exhibit A shall constitute a legal day's work under this contract.

B. In accordance with California Labor Code Section 1811, the time of service of any worker employed in performance of the services described in Exhibit A is limited to 8 hours during any one calendar day, and 40 hours during any one calendar week, except in accordance with California Labor Code Section 1815, which provides that work in excess of 8 hours during any one calendar day and 40 hours during any one calendar week is permitted upon compensation for all hours worked in excess of 8 hours during any one calendar day and 40 hours during any one calendar week at not less than one-and-one-half times the basic rate of pay.

C. The Contractor and its subcontractors shall forfeit as a penalty to the City $25 for each worker employed in the performance of the services described in Exhibit A for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day, or more than 40 hours in any one calendar week, in violation of the provisions of California Labor Code Section 1810 and following.

WAGES:

A. In accordance with California Labor Code Section 1773.2, the City has determined the general prevailing wages in the locality in which the services described in Exhibit A are to be performed for each craft or type of work needed to be as published by the State of California Department of Industrial Relations, Division of Labor Statistics and Research, a copy of which is on file in the City Public Works Office and shall be made available on request. The Contractor and subcontractors engaged in the performance of the services described in Exhibit A shall pay no less than these rates to all persons engaged in performance of the services or work.

B. In accordance with California Labor Code Section 1775, the Contractor and any subcontractors engaged in performance of the services described in Exhibit A shall comply with California Labor Code Section 1775, which establishes penalties per day for each worker engaged in the performance of the services described in Exhibit A that the Contractor or any subcontractor pays less than the specified prevailing wage. The amount of such penalty shall be determined by the Labor Commissioner and shall be based on consideration of the mistake, inadvertence, or neglect of the Contractor or subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or subcontractor in meeting applicable prevailing wage obligations, or the willful failure by the Contractor or subcontractor to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor or subcontractor had knowledge of their obligations under the California Labor Code. The Contractor or subcontractor shall pay the

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difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate. If a subcontractor worker engaged in performance of the services described in Exhibit A is not paid the general prevailing per diem wages by the subcontractor, the Contractor is not liable for any penalties therefore unless the Contractor had knowledge of that failure or unless the Contractor fails to comply with all of the following requirements:

1. The contract executed between the Contractor and the subcontractor for the performance of part of the services described in Exhibit A shall include a copy of the provisions of California Labor Code Sections 1771, 1775, 1776, 1777.5, 1813, and 1815.

2. The Contractor shall monitor payment of the specified general prevailing rate of per diem wages by the subcontractor by periodic review of the subcontractor's certified payroll records.

3. Upon becoming aware of a subcontractor's failure to pay the specified prevailing rate of wages, the Contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for performance of the services described in Exhibit A.

4. Prior to making final payment to the subcontractor, the Contractor shall obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has paid the specified general prevailing rate of per diem wages for employees engaged in the performance of the services described in Exhibit A and any amounts due pursuant to California Labor Code Section 1813.

C. In accordance with California Labor Code Section 1776, the Contractor and each subcontractor engaged in performance of the services described in Exhibit A shall keep accurate payroll records showing the name, address, social security number, work, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed in performance of the services described in Exhibit A. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

1. The information contained in the payroll record is true and correct.

2. The employer has complied with the requirements of California Labor Code Sections 1771, 1811, and 1815 for any work performed by the employer's employees on the public works project.

The payroll records required pursuant to California Labor Code Section 1776 shall be certified and sent directly to the Labor Commissioner, and available for inspection by the Owner and its authorized representatives, the Division of Labor Standards Enforcement, the Division of Apprenticeship Standards of the Department of Industrial Relations and shall otherwise be available for inspection in accordance with California Labor Code Section 1776.

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D. In accordance with California Labor Code Section 1777.5, the Contractor, on behalf of the Contractor and any subcontractors engaged in performance of the services described in Exhibit A, shall be responsible for ensuring compliance with California Labor Code Section 1777.5 governing employment and payment of apprentices on public works contracts.

E. In case it becomes necessary for the Contractor or any subcontractor engaged in performance of the services described in Exhibit A to employ for the services described in Exhibit A any person in a trade or occupation (except executive, supervisory, administrative, clerical, or other non manual workers as such) for which no minimum wage rate has been determined by the Director of the Department of Industrial Relations, the Contractor or subcontractor shall pay the minimum rate of wages specified therein for the classification which most nearly corresponds to services described in Exhibit A to be performed by that person. The minimum rate thus furnished shall be applicable as a minimum for such trade or occupation from the time of the initial employment of the person affected and during the continuance of such employment.

SLIDE GUYS RESTORATION INC.

# BIANNUALMAINTNENANCE PROPOSAL

November 28, 2022

City of Dublin – Waterslide Maintenance
Dustin Stene, Recreation Supervisor
Dustin.stene@dublin

**SUBJECT: BI-ANNUAL WATERSLIDE MAINTENANCE FOR CITY OF DUBLIN'S RFB.**

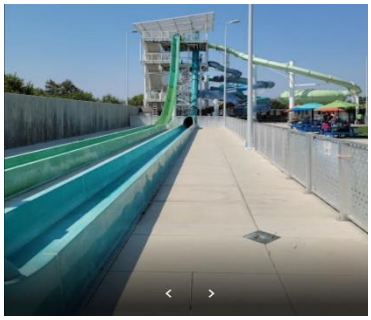
Slide Guys Restoration would like to participate in the City of Dublin bi-annual waterslide maintenance. Bid reads as follows - "WATERSLIDE TOWER This biannual service requires inspection and preparation/repair of all waterslides prior to the California Occupational and Health Administration (OSHA) inspection that occurs annually each April and again after the conclusion of the water park season each of October. Contractors should be prepared to inspect the slides and structures for any damages or ware and prepare slides for both the waterpark season opening and winter closure"**. 1. Preseason inspection and service must be completed by April 1 of each year. 2. Post season inspection and service must be completed by October 31 of each year.**

Repelling will be required. To complete the repelling requirement, **contractors must be emergency rope access certified and provide the certification to the city** prior to performance of the project

**Repair any joint caulking**
**Repair chip or cracking in gel coat**
**Repair any separating seams or seams with "rise" or "run" e. Repair safety netting as require**
**Repair safety netting as needed**





**Please note: All ENCLOSED sections on all slides will be waxed but EXCLUDES 4 phase polish & Buff. All open sections will be polished, buffed, & waxed.**

## ITEM: Slide A (Riptide Rider)

**Notes**: RAL – 251'

**Work Description**: **4 Phase Polish and wax – Entire open sections**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware
- Caulk seams with 3M-4000 as needed

**Amount…… $11,295.00**

## ITEM: Slide B (Golden Wave)

**Notes**: RAL - 199'

**Work Description**: **4 Phase Polish and wax – Entire open sections**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware
- Caulk seams with 3M-4000 as needed

**Amount…… $8,955.00**

## ITEM: Slide C (Mt Diablue)

**Notes**: RAL – 245'

**Work Description**: **4 Phase Polish and wax – Entire open sections – EXCLUDING Bowl**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware
- Caulk seams with 3M-4000 as needed

**Amount…… $11,025.00**

## ITEM: Slide D (Shamrock Swirl)

**Notes**: RAL – 71'

**Work Description**: **4 Phase Polish and wax – Entire open sections**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware
- Caulk seams with 3M-4000 as needed

**Amount…… $2,130.00**

ITEM: Slide E (Dublin Screamer Speed Slide)

**Notes**: RAL 176' (Repelling work required) Enclosed w/runout

**Work Description**: **4 Phase Polish and wax – Entire open sections – EXCLUDING BOWL (Bowl will get waxed not buffed)**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware
- Caulk seams with 3M-4000 as needed

**Amount…… $7,920.00**

ITEM: Slide F (Emerald Plunge Speed Slide)

**Notes**: RAL – 154' (Repelling work required)

**Work Description**: **4 Phase Polish and wax – Entire open sections**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware
- Caulk seams with 3M-4000 as needed

**Amount…… $6,930.00**

## Aquatic Play Structure (Splash Zone)

ITEM: Slide G (Tandem Slide)

**Notes**: RAL – 14'

**Work Description**: **4 Phase Polish and wax – Entire open sections**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware

- Caulk seams with 3M-4000 as needed

**Amount…… $2000.00**

ITEM: Slide H (Children's Tub Slide)

**Notes**: RAL – 36'

**Work Description**: **4 Phase Polish and wax – Entire open sections**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware
- Caulk seams with 3M-4000 as needed

**Amount…… $1,620.00**

ITEM: 2 Independent Runouts

**Notes**: RAL –

**Work Description**: **4 Phase Polish and wax- Entire open sections**

- Remove oxidation and scale build up (High-pressure wash 4,000 psi with biodegradable degreasing agent and hot water blast as per SSPCSP1 Standard)
- Polish & Wax slide (Hand wax if necessary)
- Refurbish any minor chips
- Fully inspect exterior hardware
- Caulk seams with 3M-4000 as needed

**Amount…… $1,300.00**

*We recommend Marine Grade 3M-4000 for superior caulk.
** This bid includes repair of any separating seams or seams with "rise" or "run"
***Documentation for all repairs, that includes who made the repairs and the date, along with the scope of work will be submitted within five business days of repair

**TOTAL PROJECT COST – $63,175.00 Spring / 63,175.00 Fall**

**($10,000.00 is allotted for prevailing wage)**

**ESTIMATED TIME VALUE OF PROJECT – 7 to 10 DAYS**

**– WEATHER PERMITTING –**

**PREMIUM PRODUCTS WE USE**

Ashland Gel-Kote /Premium grade Vinyl Ester blend grade filler / 3M-4000 marine grade caulk / Epoxy Vinyl Ester Resin / Amerlock Clear Primer / PSX-700 Polysiloxane paint (marine grade) / Fiberglass – 1.5 oz. chop Mat & Biaxial 1088 /Acetone / 3M Super Duty Compound

**Gel coat** is referred to the interior coating on fiberglass slides and is the only coating to be used to protect the underlying fiberglass, per the manufacture. White gel is recommended for more of a maintenance free, because white gel looks cleaner even when light oxidation is present.

**Paint** is only applied to the exterior of slides. A commercial marine grade paint is the only coating suitable for a slides exterior coating per manufacturer's recommendations.

**Oxidation** should be removed annually with a professional maintenance plan. Oxidation build up results in drag for riders and acts like sandpaper, scuffing mills of gel off slide when riders go down the slide.

**Thinning gel** is when mils are removed slowly over time with regular usage of slide, chemicals, weather, oxidation, and annual polish & buff. A slide that has the proper mils of gel coat applied (18-24mls) should last 8 to 10 years, if maintained properly.

**Failed coatings** Gel or paint– The coating lift, bubbles, peels. This may result from Incorrect product used, not mixed/applied properly, unsuitable weather conditions during application, or coating was not applied according to industry standards. Solution: Re-gel or repaint with Amerlock primer. Failed coatings compromise the fiberglass.

Only use Vinyl Ester Blend Grade Filler will be used for repairs.

**Polish & Wax is a cosmetic refurbish**. Structural refurbish is defined as an obvious threat to the guests. Unless otherwise specified, in the work description above, structural refurbishment is not included in the proposal nor price. If Structural refurbishment is required and is not noted on the proposal to repair/refurbish, a change order will be required to include the refurbishment / repair.

Please note that large amounts of dust will be created from the project that we have no control over. We do a thorough power wash afterwards, removing any dust caused by sanding, to restore cleanliness to the facility.

**Caulked seams are not a guarantee to stop them from leaking* and are not under warranty.

Slides that require an additional coat of paint will be charged an additional 50% of first cote price due to time/materials/extra process to ensure premium quality outcome.

Slide Guys Restoration reserves the right to have adequate access to the project area in order to complete the project as efficiently as Slide Guys Restoration deems necessary. This may require, but not limited, to working 8 hours per day/5 days a week. The park is responsible for providing an adequate water source, electrical power (multiple circuits will be needed), restroom facilities.

**Payment** due upon completion of project, Wire transfer or via mail to 4342 Old M51, Croswell, MI 48422. Accounts 30 days past due are subject to a 5% late.

**Warranty:** If for any reason your paint, Gel coat, or structural refurbishment does peels, lifts, bubbles, flakes off or come apart (de-laminating) and you are within your warranty period, we will come out within 30 days to correct the issue.

- **5-year warranty** on the paint for adhesion on waterslides
- **1-year warranty** on paint for adhesion on columns and kiddy structures
- **5-year warranty** on the structural fiberglass refurbish not to delaminate
- **2-year warranty** on the Gel Kote. Extend warranty to **5-year** with yearly maintenance plan

We, at Slide Guys Restoration, are committed to quality and customer satisfaction. We have serviced some of the largest water parks in North America and are looking forward to putting our experience to work for you. Please feel free to call our office at 833-234-9255 or my cell at 586.909.2001 if you have any questions. Thank you for your time and consideration.

***Confidentiality Agreement***

***The information in this document is confidential to whom it is addressed and should not be disclosed to another person. It may not be reproduced neither whole, in part, nor may any of the information contained therein be disclosed without the prior written consent of the directors of Slide Guys Restoration.***

Sincerely,

Jordan Bakeman
Customer Relations/Co-Owner
Jordan@slideguysrestoration.com
O: 833.234.9255
C: 586.909.2001
www.slideguysrestoration.com

# REQUEST FOR PROPOSALS

## Water Slide Maintenance

## City of Dublin

**Proposals must be received by: November 7th, 2022, before 4:00 pm**

**Dustin Stene, Recreation Supervisor**
**Dustin.Stene@dublin.ca.gov**

Proposals will be evaluated on the following: a) qualifications and specific experience of key project team members., b) quality and completeness of the proposal, c) experience with engagement of similar scope and complexity d), satisfaction of previous clients e) cost of providing the contractor services for this project.

**Request for Proposal**
**For**
**Waterslide Maintenance**

## Overview

The City of Dublin is requesting proposals for waterslide maintenance services for the award winning, 31,000 square-foot Wave Aquatic Center located at Emerald Glen Park in Dublin, California. The boardwalk-themed waterpark includes a six-waterslide tower featuring two speed slides, and an aquatic play structure (splash zone). The maintenance services requested include biannual maintenance, inspections and as-needed services for the contract period beginning January 1, 2023, through December 31, 2025 with option of two, one-year extensions.

## Project Description

The Wave waterslide amenities include:

1. A waterslide tower featuring 6 waterslides, including two speed slides and five runouts.

2. An aquatic play structure (splash zone) including two children's waterslides with independent runouts and multiple spray features.

The City is seeking proposals from qualified waterslide maintenance providers interested in handling the regular ongoing waterslide maintenance as follows:

WATERSLIDE TOWER
This biannual service requires inspection and preparation/repair of all waterslides prior to the California Occupational and Health Administration (OSHA) inspection that occurs annually each April and again after the conclusion of the water park season each of October. Contractors should be prepared to inspect the slides and structures for any damages or ware, and prepare slides for both the waterpark season opening and winter closure.

1. Preseason inspection and service must be completed by April 1 of each year.
2. Post season inspection and service must be completed by October 31 of each year.

To properly inspect, maintain and repair (if necessary) the two speed slides. Repelling will be required. To complete the repelling requirement, contractors must be emergency rope access certified and provide the certification to the City prior to performance of the project. Documentation for all repairs, including who made the repairs and the date, along with the scope of work should be submitted within five business days of repair.

3. Description
    a. Four Waterslides
        i. Slide A (Riptide Rider) – 251 ft
        ii. Slide B (Golden Wave) – 199 ft
        iii. Slide C (Mt. Diablue) – 245 ft

iv. Slide D (Shamrock Swirl) – 71 ft

b. Two Speed Slides (repelling work required)
   i. Slide E (Dublin Screamer Speed Slide) – 176 ft
   ii. Slide F (Emerald Plunge Speed Slide)– 154 ft

c. Six Slide Runouts

4. Waterslide Maintenance Services
   a. Wax and inspect waterslides two times annually using "Stay Sealed" high gloss water slide protectant/sealant/wax to the complete surface of slide interior.
      i. Pre-season wax to be completed by April 1of each year
      ii. End of season wax to be completed by October 31 of each year
      iii. Hand polish all slides as needed
      iv. High-pressure water wash (up to 4,000 p.s.i.) using biodegradable degreasing
         1. Agent and steam/hot water blast where necessary, to remove any grease, oil, loose paint, dirt and oxidation.
   b. Repair any joint caulking
   c. Repair chip or cracking in gel coat
   d. Repair any separating seams or seams with "rise" or "run"
      i. Perform Semi-Annual and Annual Inspections according to WhiteWater Manual.
         1. Semi-Annual Inspection to be completed by October 31 after waterpark operation concludes and an Annual Inspection including completed repairs to be finished by April 1, before waterpark operation begins.
         2. The inspection checklist must be submitted within five business days after the inspection. This should include the date and names of inspectors, as well as their signatures signing off on the completed inspection.
         3. Submit repair estimates for anything that needs to be repaired and returned to manufacturer standards.
         4. Check all joint caulking (Silkaflex 1a construction sealant by Silka needed) and provide an estimate for repairs of joints with partial, missing, or cracked caulking.
         5. Check operation of interior nozzles for Slide D (Shamrock Swirl).
         6. Other preventative maintenance including inspection of fiberglass for cracking, joint separation, or other concerns as related
         7. Replace annual parts as indicated by WhiteWater on the Dublin Screamer drop slide (Slide E)
         8. Send roller bar out for DPT testing per ASTM E147/E1417M
         9. Replace filter cartridge (part 380188)
         10. Replace 4 solenoid valves (part 342044)
         11. Replace both bumpers (part 334849)
         12. Replace rollers 2 (part 379987) and set screws 4 (part 379833)
         13. Inspect drop slide air compressor and provide an estimate for repairs if needed

Aquatic Play Structure (Splash Zone)

Includes a WhiteWater Aqua Play structure and a variety of interactive play features. To properly inspect, maintain and repair the two children's waterslides with independent runouts. Documentation for all repairs that includes who made the repairs and the date, along with the scope of work should be submitted within five business days of repair.

1. Preseason service must be completed by the following dates April 1 of each year
2. Post season service must be completed by the following dates October 31 of each year
3. Description
    a. Two Aqua Play Slides
        i. Slide G Tandem Slide – 14 ft
        ii. Slide H Child's Tub Slide – 36 ft
    b. Two independent runouts
4. Services
    a. Wax waterslides two times annually using "Stay Sealed" high gloss water slide protectant/sealant/wax to the complete surface of slide interior.
        i. Pre-season wax to be completed by April 1each year
        ii. End of season wax to be completed by October 31, each year
        iii. Hand polish both slides as needed
        iv. High-pressure water wash (up to 4,000 p.s.i.) using biodegradable degreasing
            1. Agent and steam/hot water blast where necessary, in order to remove any grease, oil, loose paint, dirt and oxidation.
        v. Perform Semi-Annual and Annual Inspections according to WhiteWater Manual.
            1. Semi-Annual Inspection to be completed by October 31 after waterpark operation concludes and the Annual Inspection to be completed by April 1, before waterpark operation begins.
            2. The inspection checklist must be submitted within five business days after the inspection. This should include the date and names of inspectors, as well as their signatures signing off on the completed inspection.
            3. Submit repair estimates for anything that needs to be repaired and returned to manufacturer standards.
            4. Check all joint caulking (Silkaflex 1a construction sealant by Silka needed) and provide an estimate for repairs of joints with partial, missing, or cracked caulking.
            5. Other preventative maintenance including inspection of fiberglass for cracking, joint separation, or other concerns as related
    b. Repair any joint caulking
    c. Repair chip or cracking in gel coat
    d. Repair any separating seams or seams with "rise" or "run"
    e. Repair safety netting as required

**Process and General Conditions**

1. Proposers shall submit one electronic copy by emailed PDF attachment only. Do not submit via Cloud-based systems or link. Each submission shall be sent to Dustin Stene at Dustin.Stene@dublin.ca.gov with the following subject line: Submittal for RFP for Waterslide Maintenance.
2. Deadline for submitting the proposal is Monday, November 7th, at 4:00 p.m.
3. The City will not pay for any costs incurred in preparation and submission of the proposals or in anticipation of a contract.

**Schedule for RFP Process**

| | |
|---|---|
| **October 19th, 2022** | Request for Proposals released. |
| **November 1st, 2022** | Deadline to submit questions to City of Dublin |
| **November 4th, 2022** | Addendum posted, if required |
| **November 7th, 2022** | Proposals are due no later than 4:00 PM on November 7th, 2022, emailed as PDF attachment only |
| **December 6th, 2022** | Contractor Services Agreement scheduled for approval by the Dublin City Council. |

**(Tentative dates, subject to change)**

**RFP Submittal Requirements**

Please prepare and organize your Statement of Qualification based on the requirements provided below. Any other information you would like to include should be placed in a separated section at the back of your Statement of Qualification. Please note however that the RFP submittal is limited to **30 pages maximum** single sided (excluding resumes), and should be submitted in an 8 ½ x 11 format, in 12-point font. Page limit excludes a table of contents and resumes for Consultant's team.

Interested contractors are requested to submit one PDF electronic copy of their Proposal as follows:

1. Enclose a cover letter not to exceed one page, describing the contractor's interest and commitment to perform work necessary to provide pool maintenance services. The person authorized by the contractor to negotiate a contract with the City of Dublin shall sign the cover letter. Please include this cover letter within document and not as a separate page.

2. State the qualifications and experience of the contractor/individual(s). Please emphasize the specific qualifications and experience with engagements of similar scope and complexity.

3. Provide at least three references (names and current phone numbers) from recent work (previous five years) similar to the services outlined in this request for proposals. Please include a brief description of the work performed and the role performed.

4. List key staff members, including identification of the Project Manager/primary point-of-contact. Include each team member's availability, including all existing committed hours, and the ability of being able to perform services.

5. Provide an approach to performing the work, showing the flow of various tasks and demonstrating the clear understanding of the requested work.

6. Present BID form **(Attachment B)** proposed project budget, to include a compensation rate schedule for services.

7. Provide confirmation of ability to meet the City's Standard Contractor Agreement and insurance requirements. Exceptions to the Agreement and insurance requirements shall be specifically noted in the Proposal.

Please provide electronic PDF copies of your Proposal to City offices **no later than November 7th, 2022, by 4:00 p.m.** The entire Proposal (excluding resumes) should be a **maximum** of 30 pages. Submittals should be addressed to Dustin Stene via e-mail at: dustin.stene@dublin.ca.gov

**Any Proposal submitted after the stated deadline will not be accepted for consideration.**

**Standard Contractor Services Agreement:**

It is anticipated that the services covered by the Agreement resulting from this solicitation will be performed on a time and materials fee basis for a specified scope of work. The term of the agreement will begin January 1st, 2023.

A sample of the City's Standard Contractor Services Agreement (Agreement), including insurance requirements, is provided as **Attachment A**.

If the interested contractor desires to take exception to the Agreement and/or insurance requirements, the interested contractor shall clearly identify proposed changes to the Agreement and furnish the reason for these changes, which shall be included in the qualification. Exceptions will be taken into consideration in evaluating Proposals. Otherwise, the interested contractor is to state in the proposal that the Agreement and insurance requirements are acceptable.

Consideration for exceptions will not be considered if not included in the submitted proposal.

**Conflict of Interest**

Proposer agrees that, for the term of this contract, no member, officer, or employee of the City of Dublin, or of a public body within Alameda County or member or delegate to the Congress of

the United States, during his/her tenure or for one year thereafter, shall have any direct interest in the contracts or any direct or material benefit arising therefrom.

Proposers must provide a list of any potential conflicts of interest in working for the City of Dublin. This must include, but is not limited to, a list of your f clients who are the following: Private clients located or operating within the City of Dublin limits, Dublin San Ramon Service District, US Army Camp Parks and/or the County of Alameda, and a brief description of work for these clients. Proposers must also identify any other clients (including public entities), that may pose a potential conflict of interest, as well as a brief description of work you provide to these clients.

This list must include all potential conflicts of interest within the year prior to the release of this RFP as well as current and future commitments to other projects.

Principals and those performing work for City of Dublin may be required to submit a California Fair Political Practices Commission (FPPC) Form 700: Statement of Economic Interests documenting potential financial conflicts of interest. For additional information, proposers should refer to the FPPC website at http://www.fppc.ca.gov/Form700.html.

**Equal Employment Opportunity**

Proposer shall not, on the grounds of race, color, sex, age, religion, national origin, ancestry, physical handicap, medical condition, or marital status either discriminate or permit discrimination against any employee or applicant for employment in any manner prohibited by Federal, State or local laws. In the event of Proposer non-compliance, the City of Dublin may cancel, terminate or suspend the Contract in whole or in part. Proposer may also be declared ineligible for further contracts with the City of Dublin.

Proposer shall take affirmative action to ensure that applicants are employed, and that employees are treated during their employment, without regard to their race, religion, color, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Proposer and its sub-contractors shall post in conspicuous places, available to all employees and applicants for employment, a notice setting forth the following provisions [29 U.S.C. § 623, 42 U.S.C. § 2000, 42 U.S.C. § 6102, 42 U.S.C. § 12112, 42 U.S.C. § 12132, 49 U.S.C. § 5332, 29 CFR Part 1630, 41 CFR Parts 60 et seq.].

**Governing Law**

This RFP summarizes the applicable laws and governance, when in conflict applicable State/Federal guidelines shall apply. The contract and legal relations between the parties hereto shall be governed and construed in accordance with the laws of the State of California.

**Insurance Requirements**

The Contractor shall provide insurance coverage as follows in conformance with the City of Dublin's requirements:

| | |
|---|---|
| Commercial General Liability Insurance | $2,000,000 |
| Automobile Liability Insurance | $2,000,000 |
| Professional Liability Insurance | $1,000,000 |
| Statutory Workers' Compensation Insurance and Employer's Liability Insurance | $1,000,000 |

**References**

Contractor must include three (3) references for which the company has provided services similar to those described in this RFP. Reference information shall include: Name, Address, Contact, Title, Phone Number, and Term of the Contract.

**Review and Selection Process**

The City reserves the right to make the selection based on its sole discretion. A subcommittee selected by City Staff will evaluate proposals provided in response to this RFP. Informal interviews may be conducted by City staff, and may include more than one contractor that has submitted a Proposal.

Based on input from this review process, a recommendation will be made to the City Manager. The City Manager will make a recommendation to the City Council for award of contract services.

The City reserves the right to award a contract to the contractor that the City feels best meets the requirements of the RFP. The City reserves the right to reject any and all Proposals prior to execution of the Agreement, with no penalty to the City.

**Selection of Contractor**

Submitted Proposals will be evaluated and scored using the following criteria:

- Qualifications and specific experience of key project team members.
- Quality and completeness of the proposal.
- Experience with engagement of similar scope and complexity.
- Satisfaction of previous clients.
- Cost of providing the contractor services for this project.

**Attachment A**

**Standard Contractor Services Agreement**

CONTRACTOR SERVICES AGREEMENT BETWEEN
THE CITY OF DUBLIN AND CONTRACTOR

REMOVED EXAMPLE AGREEMENT FOR CITY
COUNCIL AGENDA PACKET

**Attachment B**

**WATERSLIDE MAINTENANCE SERVICES - BID FORM**
The City of Dublin will review proposals and select the lowest responsible bidder for the identified scope of work.

Name of Company: _____
Contact Person: _____ Phone: _____
Mailing Address: _____
Email: _____Website: _____

**The Wave Waterslide Maintenance-Optional**

**I. Regular Maintenance Services**

$ _____ Semi-Annual Inspection

$ _____ Annual Inspection and Parts Replacement

$ _____ Pre-Season Waxing

$ _____ Post-Season Waxing

**As Needed Maintenance and Repair Services**

$_____ per hour for repair work and emergency maintenance work

_____ Response time for emergency repair or maintenance work

**II. Other Charges and Parts (if any)**

$ _____ for _____

$ _____ for _____

**Attachment C – WhiteWater Manuals**

(i) Waterslides Operations & Maintenance Manual

Prepared for:
Emerald Glen Aquatic Center
Dublin, CA

Project No. 31548

Date: May 11, 2018

Reviewed and submitted by:

Claudio Barrera P. Eng

Eric Sinclair, Project Manager






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Slide Piping Detail, Slide AD– Emerald Glen Aquatic Center – Dublin, CA
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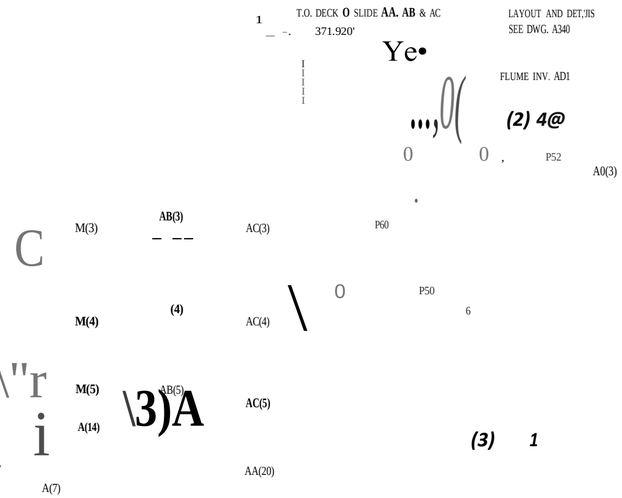
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(a) NOTES:

1. FOR GENERAL NOTES AND SPECIFICATIONS SEE DWG 130.




***Maintain markings and water levels as per S290***

## Slide Information details

Emerald Glen Aquatic Center, Dublin, California, Project # 31548

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Ride Serial Number | 31548 - AA | 31548 - AB | 31548 - AC | 31548 - AD | 31548 - AF |
| Date of Manufacture | 2016 | 2016 | 2016 | 2016 | 2016 |
| Ride Name | Poolsider | 32"Aquatube | Poolsider/32"Aquatube Combo | Champagne Bowl | Speed Slide |
| Product Family | SM | 32AT | SM/32AT | 32AT/CGR | RS |
| Ride Speed | maximum 34.4 feet per second | maximum 37.2 feet per second | maximum 35.0 feet per second | maximum 37.3 feet per second | maximum 49.2 feet per second |
| Water Flow | design 800 US gallons per minute | design 450 US gallons per minute | design 600 US gallons per minute | design 450 US gallons per minute | design 300 US gallons per minute |
| Passenger Capacity by Weight | 300 pounds | 300 pounds | 300 pounds | 300 pounds | 300 pounds |
| Passenger Capacity by Number | one person | one person | one person | one person | one person |
| Minimum Rider Height | 40 inches | 40 inches | 40 inches | 48 inches | 48 inches |
| Vehicle Type | no vehicles | no vehicles | no vehicles | no vehicles | no vehicles |
| Patent Number | www.whitewaterwest.com | www.whitewaterwest.com | www.whitewaterwest.com | www.whitewaterwest.com | www.whitewaterwest.com |

SCALE 1/8" =1'-0"

| REV | REVISION DESCRIPTION/ISSUE RECORD | DATE |
|---|---|---|
| 0 | ISSUED FOR CONSTRUCTION | DEC 01/2015 |
| | REVISED AS NOTED | OCT 19/2015 |
| | REVISED AS NOTED | SEP 3012015 |
| | REVISED AS NOTED | SEP 2512015 |
| 1 | REVISED AS NOTED | SEP 1412015 |
| | ISSUED FOR INFORMATION | AUG 2012015 |

DESIGNED BY RP DATE AUG 20/2015 PROJ. ENG. CHECK DATE
DRAWN BY KS DATE AUG 20/2015 DRAFTING CHECK DATE
SCALE ARCHIVE FILE No 31548A200

NOTE:- IMPERIAL DIMENSIONS
ALL ELEVATIONS AND CO-ORDINATES ARE IN FEET
ALL OTHER DIMENSIONS ARE IN FEET AND INCHES

B. WHITE WATER

WhiteWater West Industries Ltd
6700 McMillan Way, Richmond, B.C. Canada V6W 1J7
Tel (604) 273-1068 Fax. (604) 273-4518

GROUP A
SLIDE PATH LAYOUT

**EMERALD GLEN AQUATIC CENTER**
DUBLIN, CALIFORNIA, UNITED STATES

LEGEND:

- INDICATES YOKE LOCATION
- INDICATES COLUMN LOCATION

SHUTDOWN LANE

SHUTDOWN LANE

SHUTDOWN LANE

TURF

BIORETENTION

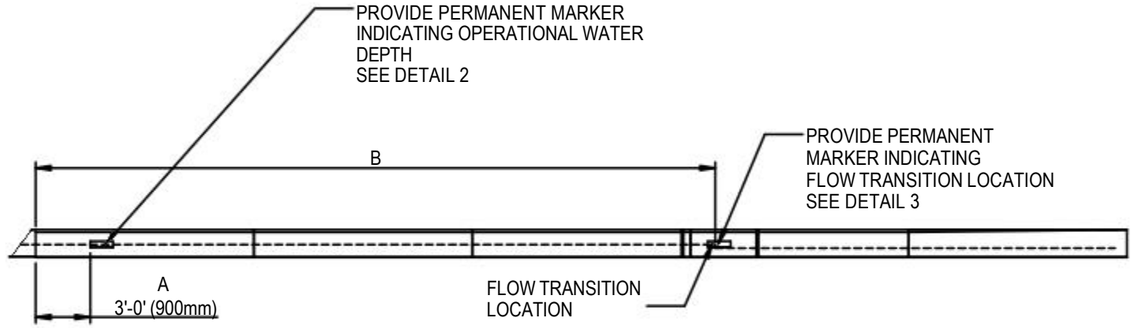
SEAT WALL

SINGLE POST SHADE UMBRELLA

TRIPLE POST SHADE UMBRELLA

31548 | A200 | 0

NOTE:
AFTER CERTIFICATION
MEASURE "A" & "B" AND
PROVIDE MARKERS FOR
ALL TYPES OF SHUTDOWN LANE
AS SHOWN IN DETAIL 2 & 3.



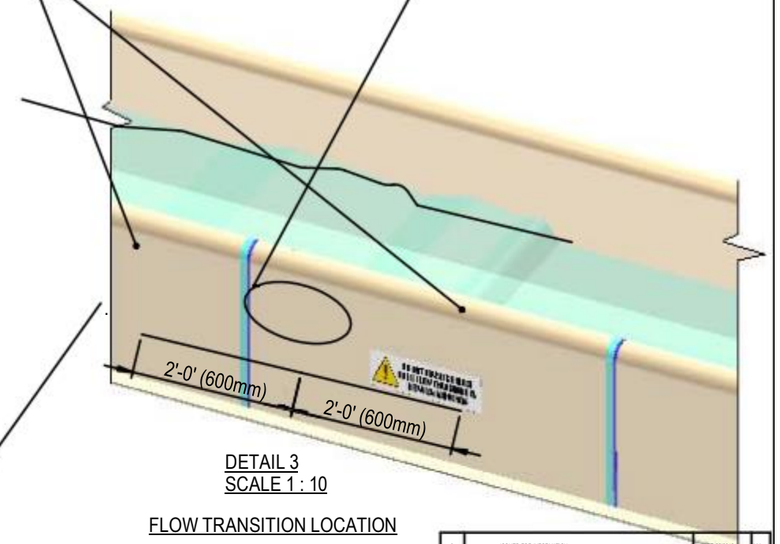

ELEVATION - SHUTDOWN LANE

NOTE:
1. FOR GENERAL NOTES AND SPECIFICATIONS SEE DWG 130.
2. SLIDE OUTLINE MAY NOT BE EXACTLY AS SHOWN.



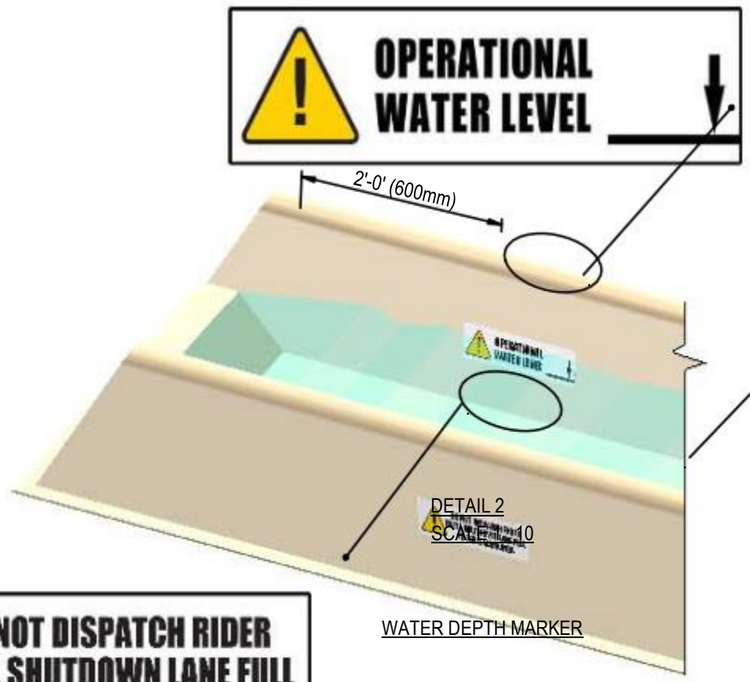



PROVIDE 1"(25mm) THICK
WATERPROOF ADHESIVE TAPE
OF CONTRASTING COLOUR ON
EACH SIDE OF FLOW
TRANSITION LOCATION



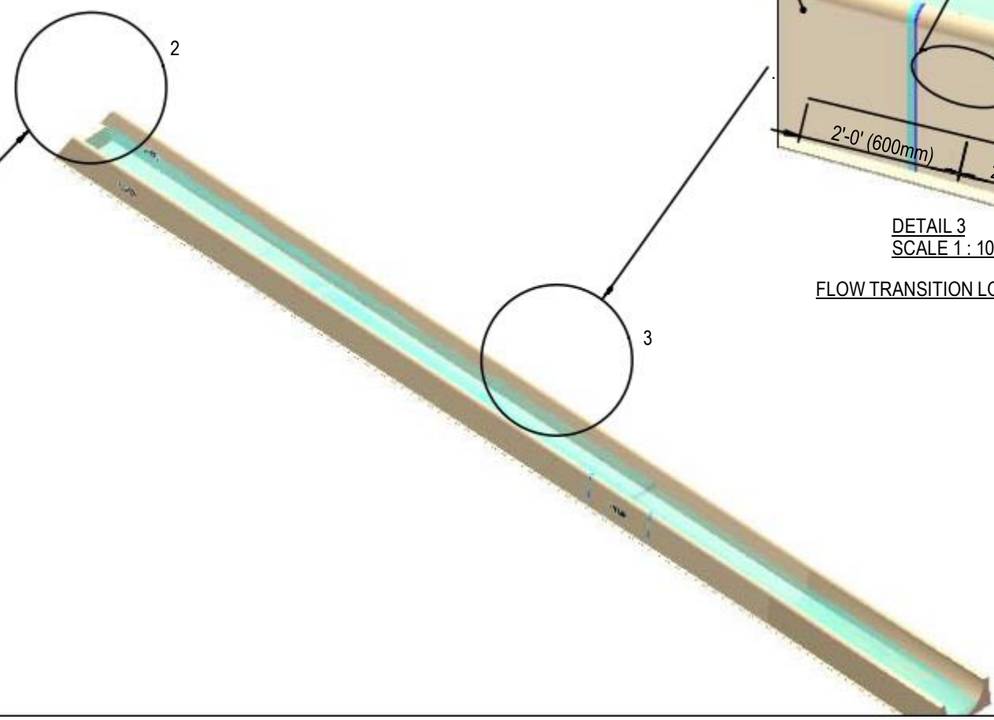

DETAIL 3
SCALE 1 : 10

FLOW TRANSITION LOCATION




DETAIL 2
SCALE 1 : 10

WATER DEPTH MARKER







| | | | |
|---|---|---|---|
| 0 | ISSUED FOR INFORMATION | APR 26 2013 | NK |
| REV. | REVISION DESCRIPTION/ISSUE RECORD | DATE | PE |

| | | | |
|---|---|---|---|
| DESIGNED BY: N.Kamarzina | DATE: APR. 26 2013 | PROJ. ENG. CHECK: - | DATE: APR. 26 2013 |
| DRAWN BY: N.Kamarzina | DATE: APR. 26 2013 | DRAFTING CHECK: | DATE: APR. 26 2013 |
| SCALE: 1:100 | | ARCHIVE FILE No.: - | |

NOTE:- METRIC DIMENSIONS
ALL ELEVATIONS AND CO-ORDINATES ARE IN METERS
ALL OTHER DIMENSIONS ARE IN MILLIMETERS

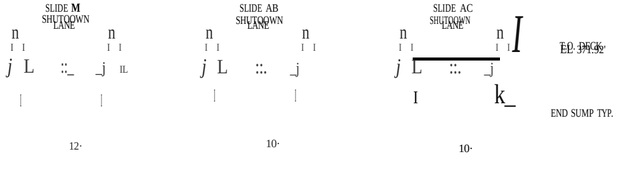
(2) WHITE WATER

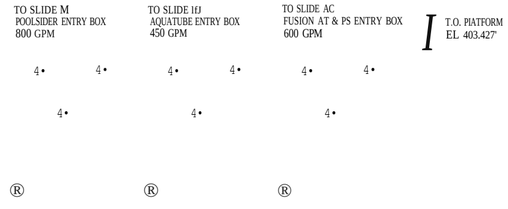
WhiteWater West Industries Ltd
6700 McMillan Way, Richmond, B.C. Canada V6W 1J7
Tel (604) 273-1068 Fax (604) 273-4518

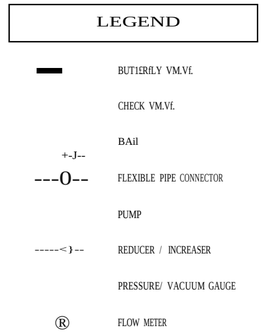
SHUTDOWN LANE
MARKING PROCEDURE
-
-
-

| | | |
|---|---|---|
| PROJECT No. - | DRAWING No. S290 | REV. 0 |

FILE : C:\Slides1\Rides\xxx-Shutdown Lane Solutions\SS-Profile_32AT-Freefall_14599-Mansfield\S290_1
LAST SAVED BY : natalie.kamarzina , ON Monday, April 29, 2013 3:24:20 PM
ALL RIGHTS RESERVED. THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY AND COPYRIGHT OF WHITEWATER AND SHALL NOT BE REPRODUCED, OR USED ON ANY OTHER WORK EXCEPT BY WRITTEN AGREEMENT WITH WHITEWATER

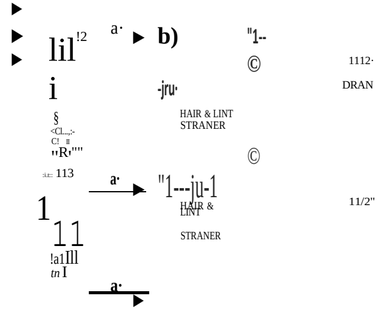



## PUMP DATA

| | |
|---|---|
| WRATE | 800 GPM |
| | 52 FT |
| POWER | 15 HP |
| TYPE | END SUCTION CENTRIFUGAL |
| QUANTITY | 1 |
| FLOW RATE | 450 GPM |
| TOH | 52 FT |
| POWER | 10 HP |
| TYPE | END SUCTION CENTRIFUGAL |
| QUANTITY | 1 |
| FLOW RATE | 600 GPM |
| TOH | 52 FT |
| POWER | 25 HP |
| TYPE | END SUCTION CENTRIFUGAL |
| QUANTITY | 1 |



6"

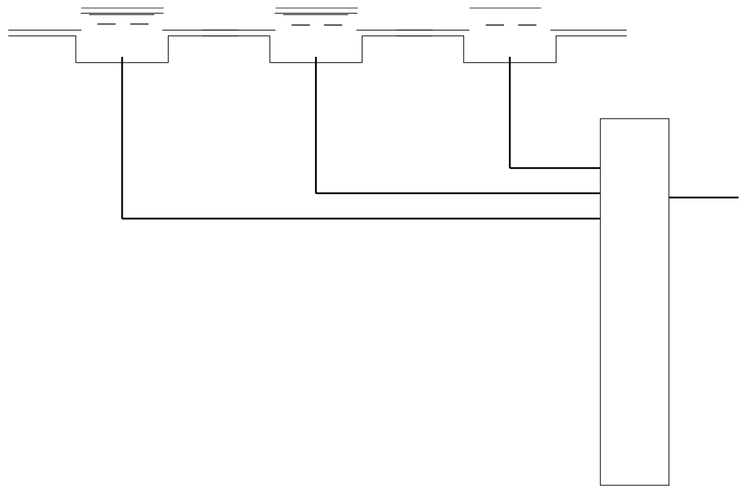
HAIR &

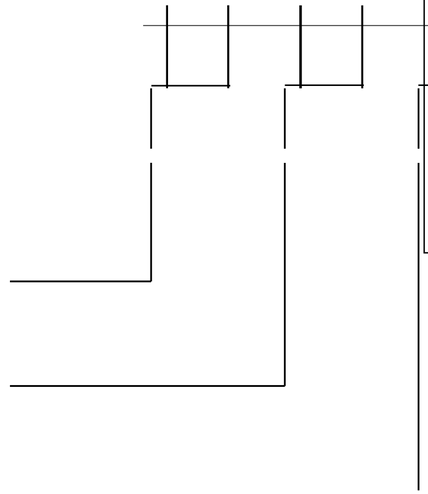
STRANER

1112·

ORAN

SLIDE AA, AB, & AC
PUMPING FLOW DIAGRAM
N. T. S.





NOTES:

1. THE SCHEMATIC SHOWN IIUSIRATES THE INTENDED FUNCTIONM. REQUIREMENTS FOR THE MECHANICM. OPIERATION OF THE WATERSLIDES. LOCM. PROJECT ENGINEERS MAY DESIGN SITE-SPECIFIC SYSTEMS THAT DIFFER FROM THIS WITH THE RESPONISIBIUIY FOR THE DESIGN RESTING 111TH THE LOCM. ENGINEER.
2. PUMP PERFORWHCE, DISCHARGE PIPE SIZE & DISCHARGE BUTTERFLY VM.VI. ARE ESSENTIM. FOR PROPER SLIDE OPERATION.
3. PROVIDE THRUST BLOCKS OR RIGID CLAMPS AT M.L BENDS AND AS REQUIRED M.ONG THE LENGTH OF SUCTION AND DISCHARGE PIPING.
4. PUMP SUCTION FLANGE SHOULD BE BELOW POOL WATER LCVCL
5. PIPE HAS TO BE RIGIDLY CLAMPED TO UNDERSIDE OF TOWER WITHIN 4 FEET OF FLEXIBLE PIPE CONNECTOR.
6. DOUBLE SUCTION INTAKES ARE SHOWN AS A SAFE1Y PRECAUTION TO ELIMI TE ENTRAPMENT HAZARDS CAUSED BY THE PUMP SUCTION.

(PA3)

| | | | |
|---|---|---|---|
| 1 | ISSUED FOR CONSTRUCTION | DEC | |
| | ISSUED FOR INFORMATION | AUG 13/2015 | |

| REVISION | DESCRIPTION/ISSUE RECORD | DATE | PE |
|---|---|---|---|

| | | | |
|---|---|---|---|
| DRAWN BY | DATE | PROJ. ENG. CHECK | DATE |
| AE | AUG 13/2015 | DRAFTING CHECK | DATE |

SCALE: AS NOTED

ARCHIVE NO./FILE: 31548A600

NOTE:- IMPERIAL DIMENSIONS
ALL ELEVATIONS AND CO-ORDINATES ARE IN FEET
ALL OTHER DIMENSIONS ARE IN FEET AND INCHES

1. WHITE WATER

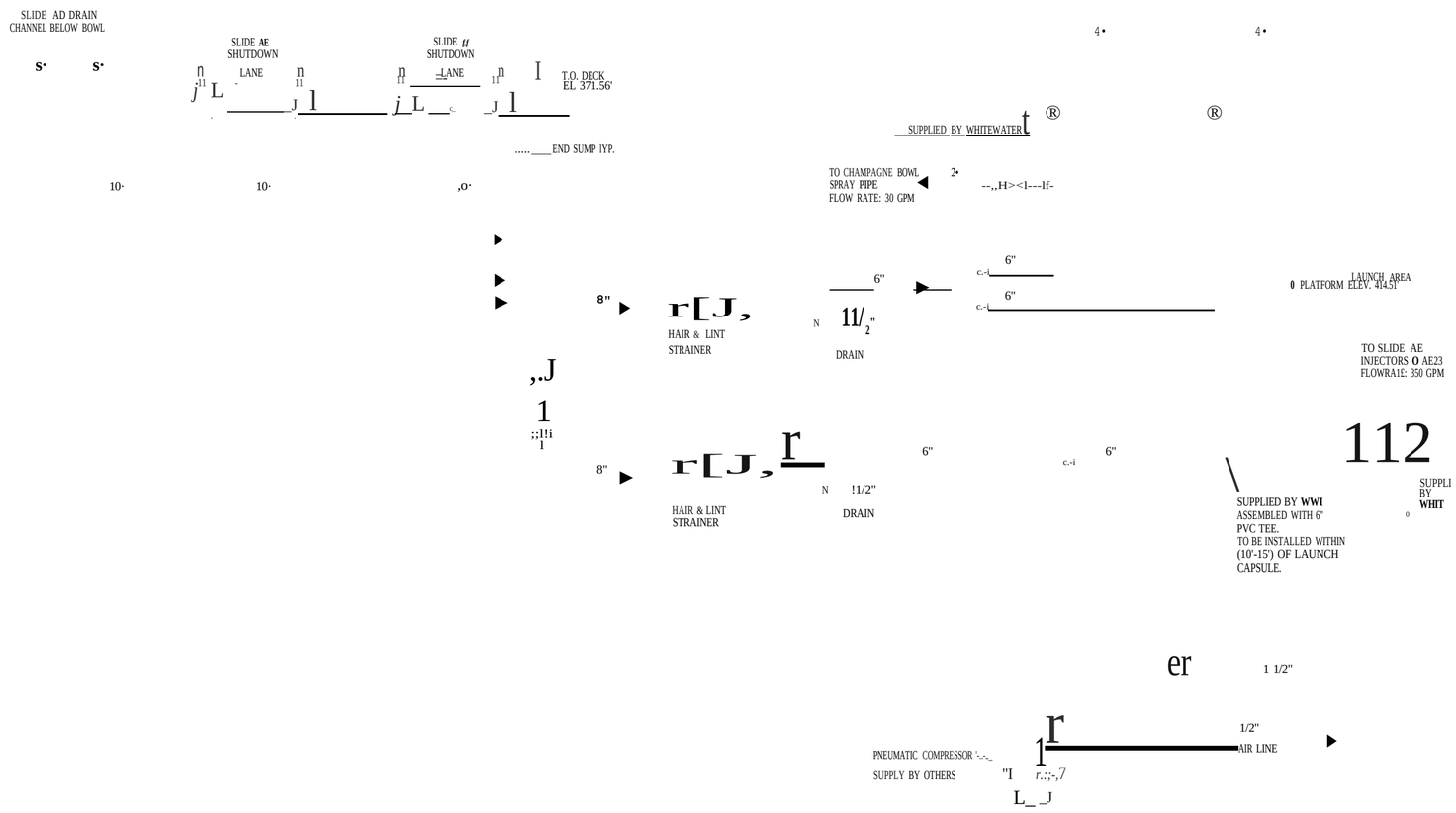
WhiteWater West Industries Ltd
6700 McMillan Way, Richmond,B.C. Canada V6W 1J7
Tel (604) 273-1068 Fax (604) 273-4518

GROUP A
SLIDE AA, AB, & AC
SLIDE PUMPING FLOW DIAGRAM

**EMERALD GLEN AQUATIC CENTER**
**DUBLIN, CALIFORNIA, UNITED STATES**

(a) A600

31548




*(a) SLIDE AD, AE, & AF*

*(b) PUMPING FLOW DIAGRAM*

N. T. S.

## LEGEND

- CHECK VALVE
- BUTTERFIY
- BALL
- FLEXIBLE PIPE CONNECTOR
- PUMP
- REDUCER/ INCREASER
- PRESSURE/ VACUUM GAUGE
- FLOW METER

### PUMP DATA

| | |
|---|---|
| FLOW RATE | 730 GPM |
| TIIH | 63 FT |
| POWER | 20 HP |
| IYPE | END SUCTION CENTRIFUGAL |
| QUANTITY | 1 |

| | |
|---|---|
| FLOW RATE | 370 GPM |
| TIIH | 70 FT |
| POWER | 10 HP |
| IYPE | END SUCTION CENTRIFUGAL |
| QUANTITY | 1 |

### PNEUMATIC COMPRESSOR DATA

| | |
|---|---|
| FLOW RATE | 3 CFM |
| PRESSURE | 100 PSI |
| POWER | 3 HP |
| QUANTITY | 1 |

| REV | REVISION DESCRIPTION/ISSUE RECORD | DATE |
|---|---|---|
| R | REVISED AS NOTED | 2018-03-14 |
| G | REVISED AS NOTED | MAY 2012016 |
| 0 | ISSUED FOR CONSTRUCTION | DEC 0112015 |
| | ISSUED FOR INFORMATION | AUG 20/2015 |

| | | | |
|---|---|---|---|
| DESIGNED BY | DATE | PROJ. ENG. CHECK | DATE |
| AE | AUG 13/2015 | | |
| DRAWN BY | DATE | DRAFTING CHECK | DATE |
| AE | AUG 13/2015 | | |
| SCALE | | ARCHIEVE FILE No. | |
| AS NOTED | | 31548A601 | |

NOTE,- IMPERIAL DIMENSIONS
ALL ELEVATIONS AND CO-ORDINATES ARE IN FEET
ALL OTHER DIMENSIONS ARE IN FEET AND INCHES

WHITE WATER
WhiteWater West Industries Ltd
6700 McMillan Way, Richmond, B.C. Canada V6W 1J7
Tel (604) 273-1068 Fax (604) 273-4518

GROUP A
SLIDE AD, AE, & AF
SLIDE PUMPING FLOW DIAGRAM

**EMERALD GLEN AQUATIC CENTER**
**DUBLIN, CALIFORNIA, UNITED STATES**

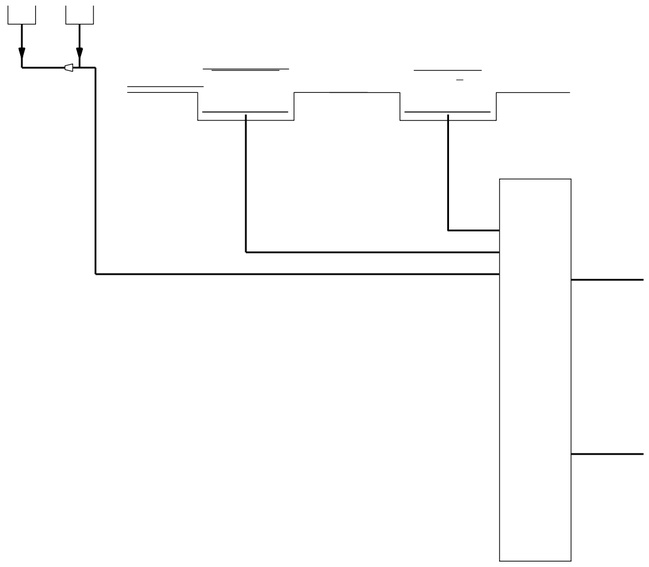
2. PUMP PERFORMANCE, DISCHARGE PIPE SIZE & DISCHARGE BUTTERFLY VALVE ARE ESSENTIAL FOR PROPER SLIDE OPERATION.
3. PROVIDE THRUST BLOCKS OR RIGID CLAMPS AT ALL BENDS AND AS REQUIRED ALONG THE LENGTH OF SUCTION AND DISCHARGE PIPING.
4. PUMP SUCTION FLANGE SHOULD BE BELOW POOL WATER LEVEL
5. PIPE HAS TO BE RIGIDLY CLAMPED TO UNDERSIDE OF TOWER **WITHIN** 4 FEET OF FLEXIBLE PIPE CONNECTOR.
6. DOUBLE SUCTION INTAKES ARE SHOWN AS A SUETY PRECAUTION TO ELIMINATE ENTRAPMENT HAZARDS CAUSED BY THE PUMP SUCTION.

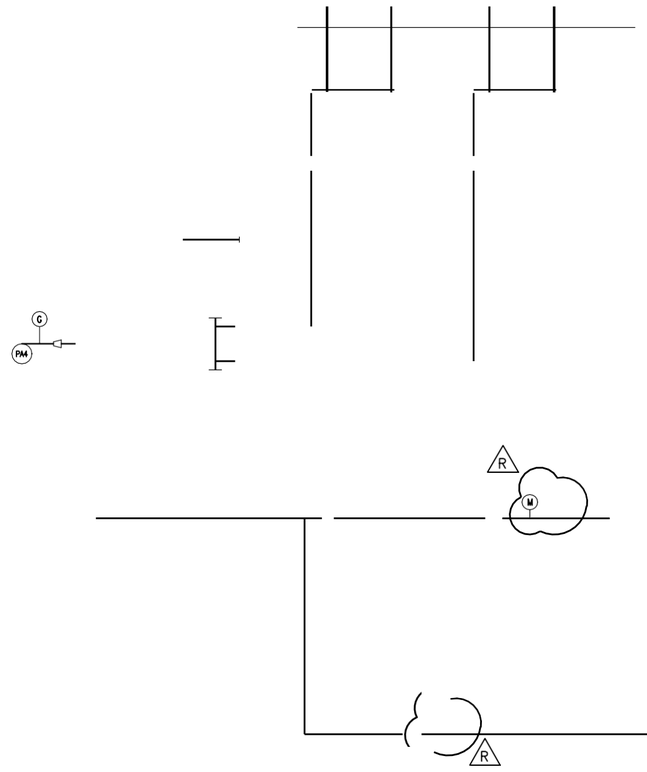
*AutoCAD SHX Text*

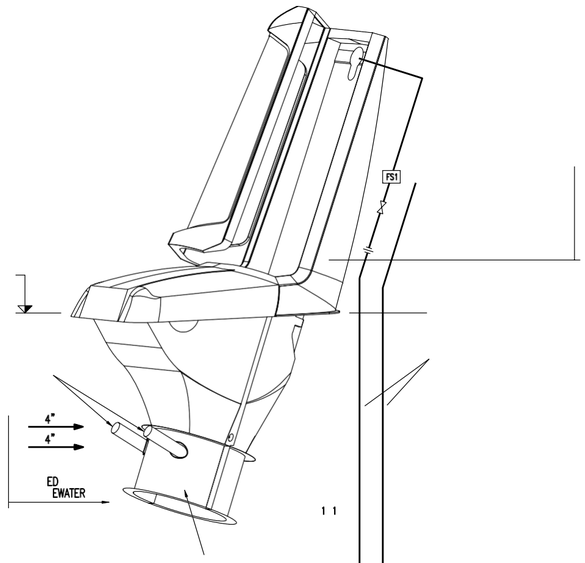
FLOW RATE: 30 GPM

31,548 )

GS-WWG- A601





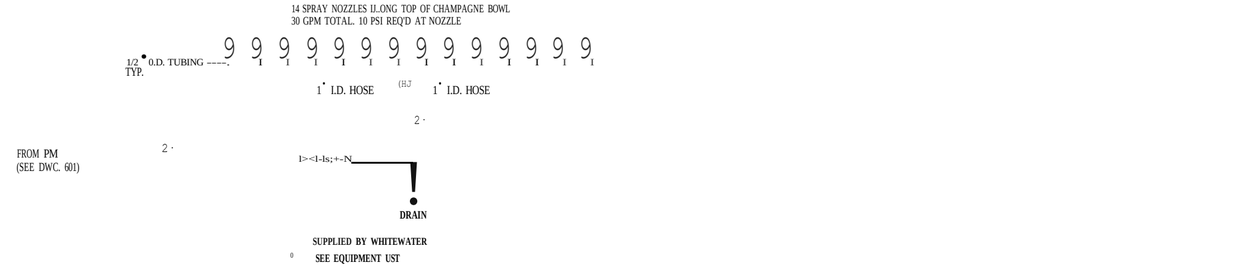



## LEGEND

Y-STRAINER

BAil VIJ..VE

REDUCER / INCRrASER



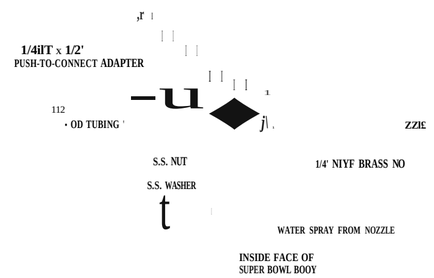

## G) CHAMPAGNE BOWL SPRAY PIPING SCHEMATIC

N. T. S.




## G) CHAMPAGNE BOWL SPRAY PIPING PLAN

1/4'=1'-o'




## G) SPRAY PIPE INSTALLATION DETAILS

5•=1'-0·

(14 UNITS)

G GENERAL REVISED MAY 2012016
0 ISSUED FOR CONSTRUCTION DEC 0112015
ISSUED FOR INFORMITION AUG 2012015

LREV REVISION DESCRIPTION/ISSUE RECORD DATE ee

DRAWN BY A E DATE AUG 13/2015 PROJ. ENG. CHECK DATE
AE DRAFTING CHECK DATE AUG 13/2015
SCALE AS NOTED ARCHIVE FILE No. 31548A602

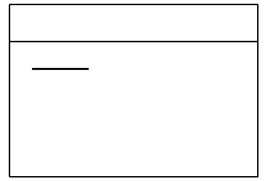
NOTE:- IMPERIAL DIMENSIONS
ALL ELEVATIONS AND CO-ORDINATES ARE IN FEET
ALL OTHER DIMENSIONS ARE IN FEET AND INCHES

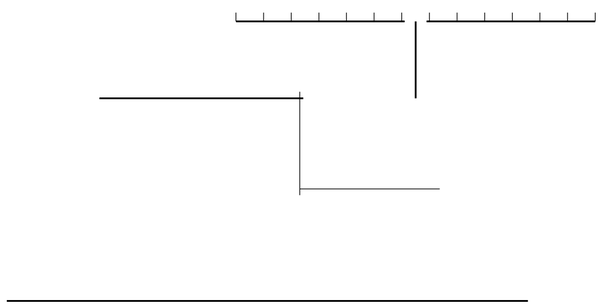
1. WHITE WATER

WhiteWater West Industries Ltd
6700 McMillan Way, Richmond, B.C. Canada V6W 1J7
Tel (604) 273-1068 Fax (604) 273-4518

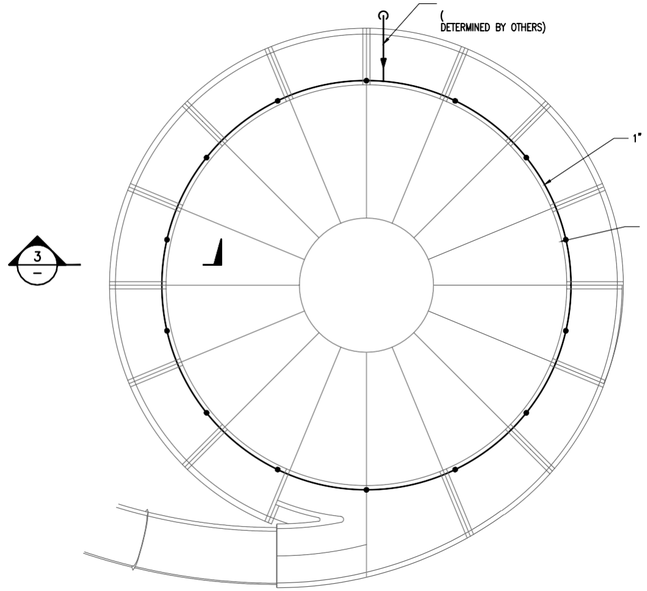
**GROUP A**
**SLIDE AD**
**SLIDE PIPING**
**DETAIL**

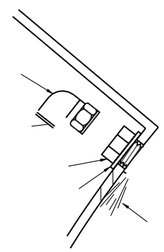
**EMERALD GLEN AQUATIC CENTER**
**DUBLIN, CALIFORNIA, UNITED STATES**

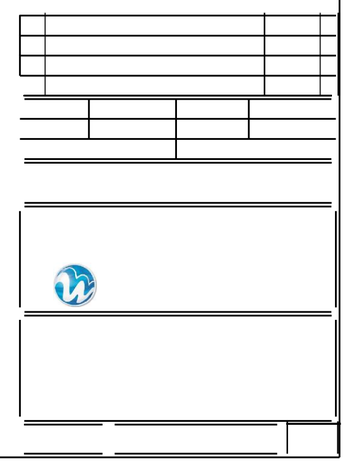




| Champagne Bowl Spray Equipment List<br>Supplied by Whitew ater | | |
|---|---|---|
| Item | Description | Qty |
| 1 | 1/4" NIYF brass nozzle (ft) | 14 |
| 2 | 3/4" ss316 hex. nut | 14 |
| 3 | 3/4" ss316 flat w asher | 14 |
| 4 | 1/2" OD tubing G900-038-050 | 28 ft |
| 5 | 1/4"mtx1/2"push-to-connect adapter G6096P-04-08 | 14 |
| 6 | 3/8"mtx1/2"push-to-connect adapter G6016P-06-08 | 14 |
| 7 | 1/2"x3/8" pvc sch 40 bushing (mtxft) | 14 |
| 8 | 1"x1/2" pvc sch 40 90 deg. elbow (hosexft) | 2 |
| 9 | 1"x1"x1/2" pvc sch 40 tee (hosexhosexft) | 12 |
| 10 | 1" pvc sch 40 adapter (mtxhose) | 2 |
| 11 | 1" ID Vinylite hose G911-100 | 90 ft |
| 12 | 2" pvc sch 40 tee (sxsxs) | 1 |
| 13 | 2"x1 1/2" pvc sch 40 bushing (spxft) | 2 |
| 14 | 2" pvc sch 40 pipe | 20 ft |
| 15 | 1" ss hose clamp G8-20 | 28 |
| 16 | 1 1/2" galv. steel loop strap w / nylon coating G6-24 | 28 |
| 17 | 2 3/4" galv. steel loop strap w / nylon coating G6-44 | 6 |
| 18 | 2" Chemline pvc true union Y-strainer YSA020EC-24 (sxs) | 1 |
| 19 | 2" pvc true union ball valve (sxs) | 2 |
| 20 | 3/8"ø x1 1/2"L ss316 hex bolt w / nut & 2 flat w ashers | 28 sets |
| 21 | 2" pvc sch 40 90 deg. elbow (sxs) | 2 |
| 22 | 2" pvc sch 40 45 deg. elbow (sxs) | 2 |





(i) PART I

# GENERAL OPERATING GUIDELINES

## Part I GENERAL OPERATING GUIDELINES

**Important Notice**
The following operating procedures are presented to waterslide owners as guidelines only. They are not intended to be mandatory or exhaustive. These guidelines do not replace proper consultation with designers, manufacturers and legal counsel, and compliance with local, state (provincial) and federal laws and regulations involving, but not limited to: health, safety and building codes.

**General Operating Considerations**

### 1. Customers

While customers are the key ingredients to the success of any waterpark, certain rules and procedures must be made clear for the park to function efficiently and safely.

#### 1.1 Posted Signs

A sign must be posted at the entrance to the waterpark that states user responsibility and conveys the following rules and regulations:

1. Read and obey all posted signs.
2. Obey all instructions given by the attendants and operators.
3. No glass, cigarettes and/or food are permitted in the water slide area.
4. Anyone under the influence of alcohol or drugs will not be permitted in the park.
5. Pregnant women and those with a history of heart problems or back trouble should not use the slides.
6. Failure to follow rules and instructions can lead to serious injuries.
7. Ride at your own risk.

**Note:** Specific sign requirements for each waterslide are detailed in Part II - Specific Operating Guidelines.

#### 1.2 Access

Provisions must be made to prevent customers from entering the water slide at any points other than at the designated entry access points.

#### 1.3 Physical Condition

Waterslide customers must be checked for proper swimwear and adequate physical condition. Swim attire should not have any metal parts that could damage the slides or cause injuries. Customers who show signs of drug and/or alcohol impairment will not be permitted on the site.

### 1.4 Visitors and Spectators

Visitors and spectators should be physically separated from the areas used by sliders. They should be kept a safe distance away from any wet areas and not be permitted to interfere with the sliders.

### 1.5 Food and Drinks

No food or drinks are allowed in the immediate area of flumes and pools or on decks, stairs and walkways surrounding flumes and pools. Food and beverages should be confined to visitor and spectator areas or similarly marked areas for sliders. Trash containers should be provided to keep litter off decks and walkways and out of flumes and pools.

## *2.* Attendants

Waterpark attendants are responsible for safe and orderly conduct of customers, safe entry and exit of riders from the slides, general crowd control and emergency procedures.

During operating hours, there must be at least one attendant on duty at all times who has completed a Red Cross or equivalent Standard First Aid and Safety course. This person must also be competent in carrying out any emergency procedures specific to the slide he or she is operating.

Every water slide should be equipped with a battery or electronically operated system to provide voice communication between attendants at different locations on the slides and park office or permanently manned control center.

### 2.1 Top of Slides

The area at the top of every water slide must be supervised by at least one attendant who has continuous and direct supervision of that area and is responsible for:

- Ensuring that customers conduct themselves in a safe and orderly manner.
- Ensuring that customers enter slides or rafts/mats properly.
- Ensuring that customers are dispatched at safe intervals.
- Visually surveying all areas of the water slide that are visible from attendant's position, with the exception of the splash pool, and communicating any problems to the other attendants.
- Ensuring that customers meet the minimum and/or maximum restrictions for the slide.
- Ensuring that any vehicles used are in good condition and if inflated, inflated properly.

### 2.2 Splash Pool

The recommended depth for the splash pool is 3.5 feet (1.07 metres) except otherwise noted in special conditions and therefore must be supervised by at least one certified lifeguard who has continuous and direct supervision of that area and is responsible for:

- Ensuring that customers conduct themselves in a safe and orderly manner.
- Ensuring that customers move into and out of splash pool in a quick and orderly manner.
- Controlling running, horseplay or other unsafe behavior on pool decks.
- Ensuring pool water levels are correct.

### 2.3 Runout Lane

The runout lanes of waterslides must be supervised by at least one attendant who has continuous and direct supervision of that area and is responsible for:

- Ensuring that customers conduct themselves in a safe and orderly manner.
- Ensuring that customers exit runout lane in a quick and orderly manner.
- Controlling running, horseplay or other unsafe behavior on slide apron.
- Ensuring water levels are at level marks and flow transition is within indicator markings.

### 2.4 Water Treatment

A specific person on each shift should be responsible for chlorination and water treatment procedures. They should be thoroughly trained in all aspects including, routine operations, handling, connection, disconnection, emergency procedures and leak control procedures. A safety chart should be posted in or near the chlorination room and a second safety chart should be placed in the pool office near the telephone. Emergency telephone numbers should also be shown on the safety charts.

### 2.5 Pool Operations

A specific person on each shift should be made responsible for all swimming pool operations, such as: circulation and filtering system operation, maintenance, inspections, backwashing and cleaning. They should be thoroughly trained by an expert in swimming pool operations.

## 3. Inspections

Permanently bound log books should be kept to record all inspections, operational tests, water quality monitoring, all accidents and unusual occurrences. Log books should be kept for a period of at least six (6) years from

the date of the last entry. Log book entries that cover the twelve (12) month period previous to the last entry in the log book should be kept readily available.

### 3.1 Slide Inspections

Daily inspections must be made to check for:

- obstructions in slide paths
- cracks, chips or bubbles in sliding surfaces
- rough patchwork at joints or cracks
- caulking protruding from joined flanges
- leaking seals at joints
- loose risers on turns
- excessive movement of flumes when walked on
- joints opening up
- proper inflation and condition of rafts, tubes and vehicles
- landing or pool bottom padding, if used, is in good condition and properly secured.

### 3.2 Mechanical Inspections

Daily inspections must be completed on each waterslide:

- before water is circulated to ensure no safety hazards exist
- with the water circulating to ensure there is sufficient water flowing in the channel and correct water level is in splash pool or runout lane
- to ensure that all the pumping and filtration equipment is operating correctly
- to ensure that conveyor system is operating properly and poses no hazard

It is the attendant's responsibility to ensure water flow is maintained in accordance with manufacturers' guidelines. Serious hazards may develop when flow is interrupted in a flume.

### 3.3 Chemical Inspections

Proper water chemical balance must be obtained each day before the facility is opened to the public. While the facility is operational, water quality testing should be performed at intervals in accordance with local health authority's guidelines. Inspections should also be made during periods of heavy usage to ensure circulation and filtration systems are handling peak loads. The attendant must keep logs of all water testings performed. A typical form for water quality testing is shown in Appendix 1-I.

The attendant must ensure that customers cannot come in contact with water treatment, re-circulation and filtration equipment. Mechanical and chemical storage rooms must be locked at all times to prevent customer access.

## 4. Accidents

The most common accidents in waterparks are: slips and falls, collisions between one riding customer and another customer, impact with the pool surface, and abrasions from sidewalls. Operators should keep detailed logs of all reported accidents onsite. A typical accident report form is included in Appendix 1-II.

### 4.1 Incident Reporting

The owner or operator shall notify the manufacturer (Whitewater West Industries Ltd.) of any known serious incidents that require immediate hospital admission. Minor injuries that may or may not require treatment shall be reported to the manufacturer if deemed to be related to the equipment design or function.

There may be local jurisdiction and laws requiring notification of incidents. The owner or operator may be required to notify these local jurisdictions in addition to the above.

### 4.2 Floatation Devices

The operator should not infer that rafts, tubes or any other floatation device, with exception of government approved life jackets, offer the user any safety benefit. Where unapproved floatation devices are provided, signs should be posted stating they are for pleasure only and should not be used as a substitute for approved floatation devices.

### 4.3 Slips and Falls

Slips and falls are a constant concern in all areas of the waterpark. All surfaces intended for pedestrian traffic, whether in the water, on walkways, on loading platforms or on stairs should be made and maintained slip-resistant. Proper periodic maintenance of walking surfaces should be carried out to remove the growth of algae and fungi which could inhibit the surfaces intended function. Adequate drainage should be maintained around all areas of the slides.

The entry section to flumes should be given particular attention with respect to slips and falls. The combination of the flowing water and the customer contacting water on a slippery surface for the first time can be confusing and disorienting. The exit area of the splashdown pool will always be wet and flowing with water which requires special attention with respect to slip-resistant surfaces, drainage and number and location of attendants.

To minimize slip and fall type accidents, attendants throughout the waterpark should control running and horseplay.

### 4.4 Bodily Collisions

Bodily collisions occur in flumes and splash pools as a result of riders traveling at different speeds and riders slowing or stopping in the flume. Restricting traffic flow with proper dispatching intervals can minimize these bodily collisions. The top attendant and lower attendant must have a view of much of the slide and a means of communication between them. The entry attendant must be alert and aware that people will travel at different rates due to variations in body weight, body friction, and rider position. Generally, the heavier the person, the faster the rider will travel. Slippery materials like nylon slide much faster than cotton clothing. All other factors being equal, riders in a sitting position will travel slower than a person lying flat on their back. Under no circumstances should customers be permitted to ride flumes in a standing position. Similarly, running or leaping entry into flumes is not to be permitted.

In addition to slide entry attendants, use of signal lights or electro-mechanical starting gates should be considered for rider entry control.
As bodily collisions in splash pool area cannot be fully controlled even with proper entry rates; splash pool attendants should be well trained, attentive and aggressive, continuously urging and encouraging customers to leave the flume discharge and splash pool area as quickly as possible. They must be alert to the possibility of problems and be prepared to enter the water at any time to assist a customer. In the event of a delay at discharge, following riders should be stopped at the entry. Riders tend to congregate in the pool because they are temporarily confused and disoriented upon impact with the water, to wait for their friends who are coming behind, or to socialize with persons in the splash pool. Collisions also result from multiple rider entry (i.e. trains). This practice is absolutely prohibited even for small children being carried on their parent's legs.
If marker buoys or lane ropes are used in the splash pool, they must be arranged so they do not become obstacles for riders. Such devices, if used, should float and be simple in design to avoid the possibility of entangling riders.

### 4.5 Chemical Hazards

Personnel must be fully trained in the use of water chemicals. Potentially fatal accidents could result from the release of gaseous chlorine. Improper chemical control could result in skin and eye irritation from excessive treatment. Bacterial problems could also arise from inadequate treatment.

## 5. Emergency Procedures

Every park must have an emergency plan with specific procedures covering:

- crowd control

- park evacuation
- drowning
- heart attacks
- cuts and burns
- neck and spinal injuries
- power or other utility failures
- fires
- security (fights, robbery, vandalism)
- exposure to chlorine
- environmental conditions (e.g., lightning, windstorms, hail, earthquakes)

An emergency plan should address those factors which affect, human safety, protection and correction of equipment, and customer relations. All employees should be trained and drilled periodically in the execution of the emergency plan. The emergency plan should be easily accessible and be located with first aid equipment and emergency telephone numbers.

Each facility should have a list of current emergency numbers posted by a telephone. The list should include the contact information for the nearest available doctor, ambulance service, hospital, rescue service, police department, fire department and poison control center. A typical emergency telephone list is shown in Appendix 1-III.

Each facility should have available the following first aid supplies:

- A standard 24-unit first aid kit stocked and readily accessible for use.
- A stretcher and blankets.
- A standard plywood backboard or other acceptable splint for persons with back and neck injuries.
- An area or room set aside for the emergency care of injuries.

**6. Operator's Changes**

WhiteWater should be advised of any changes made in slides, structures or equipment, manufactured, designed or installed by WhiteWater West Industries Ltd. Changes could affect the safety of the attraction.

(ii) PART II

# SPECIFIC OPERATING GUIDELINES

## Part II SPECIFIC OPERATING GUIDELINES

### POOL SIDER (PS) into Shutdown Lane – Slide AA

The primary operating concern in Pool Sider Slides is the possibility of one riding customer colliding with another customer, either in the flume or in the shutdown lane. This type of occurrence can be minimized by the use of well-trained attendants controlling entry and exit conditions. Other safety considerations include: slips and falls in the entry and exit areas, abrasion from the sidewalls, and impact with the shutdown lane surface.

**1. Posted Signs**

**1.1. Entry Station:**

Signs should be posted at the entry station of the ride to convey the following rules and regulations:

1. Maximum operational load: 1 person, 300 lbs. (136 kg)
2. Children less than 40 inches (1.02 m) tall are not permitted on this ride.
3. Eyeglasses must be securely affixed to riders with head straps.
4. Swim wear with exposed zippers, buckles, rivets or metal ornamentation are not permitted.
5. Only one rider to enter the flume at a time. Single Riders only!
6. Never form chains.
7. Slide must be ridden feet first lying on your back or in a sitting position. Sit up to go slower or lay down to go faster.
8. Riders must wait for the attendant's start signal before starting the ride.
9. Keep arms and hands inside the flumes at all times.
10. Do not run, dive, stand, kneel, rotate or stop in the slide.
11. At the end of the slide, obey all instructions by shutdown lane attendant and exit quickly.
12. **CAUTION:** For safety reasons, pregnant women and persons with heart conditions or back trouble should not ride this slide.

**1.2. Shutdown lane:**

Signs should be posted at the shutdown lane to convey the following rules and regulations:

1. Do not block the end of the slide.
2. Leave the shutdown lane quickly and orderly.

3. No swimming or flotation devices allowed in the shutdown lane.

## 2. Attendants

Attendants should be alert to controlling crowd behavior, ensuring safe and orderly entry and exit and controlling the proper entry rate into the slide.

### 2.1. Attendant / top (start of ride) - 1 attendant per slide

This requirement may be relaxed to not less than one attendant per platform area or level, provided that the operator ensures that attendants are able to fulfill all duties as listed.

Duties:

1. Ask each rider if they know how to ride the ride.
2. Assure the rider is in the correct body position when ready.
3. Control dispatch of riders one at a time and shall not dispatch a rider until the flume is clear of obstruction and any previous rider.
4. Ensure all riders meet requirements.
5. Ensure eyeglasses are securely affixed to the riders.
6. Observe bathing suits for zippers, buckles, rivets, etc. and do not allow them on the slide.
7. Observe riders for any physical impairments that compromise safety and do not allow them on the slide.
8. Ensure the crowd behaves in a safe and orderly manner.
9. Monitor riders in areas visible from assigned positions.

### 2.2. Attendant / shutdown lane: 1 lifeguard per 1 or 2 slides.

Duties:

1. Ensure customers conduct themselves in a safe and orderly fashion.
2. Do not allow riders to block the end of a slide. Delay dispatch of next rider if the slide landing area is obstructed.
3. Ensure that all riders exit the shutdown lane immediately upon splashdown. Do not permit guests to sit on or congregate around shutdown lane.
4. Be prepared to enter shutdown lane to assist customer out of lane.
5. Do not allow any swimming or flotation devices in shutdown lane.
6. Monitor water level and characteristics of the shutdown lanes. Shutdown lanes require extra attention to make sure water levels are at correct operating levels and flow transition has stabilized.

Too little or too much depth in the shutdown lane will affect braking distance and characteristics.

7. Signal the dispatch attendant as to when it is okay to dispatch another rider when:
   - **i. flume and shutdown lane are clear of previous riders and,**
   - **ii. water level has recovered to marked level and,**
   - **iii. flow transition is stable between markings!**

### 3. Vehicles

No vehicles are used in this slide. Patrons ride the slide in bathing suit attire according to instructions above.

### 4. Water Flow

Refer to attached mechanical drawing, A600, for design and commissioned water flows. Specific operational water flow values are determined at the time of commissioning by a WhiteWater representative. Any variations from flows after certification must be approved in writing by WhiteWater.

**32”AQUATUBE (32) into Shutdown Lane – Slide AB**

The primary operating concern in the 32”Aquatube into shutdown lane is the possibility of one riding customer colliding with another customer, either in the flume or in the shutdown lane. This type of occurrence can be minimized by the use of well-trained attendants controlling entry and exit conditions. Other safety considerations include: slips and falls in the entry and exit areas, abrasion from the sidewalls, and impact with the shutdown lane surface.

## 1. Posted Signs

### 1.1 Entry Station

Signs should be posted at the entry station of the ride to convey the following rules and regulations:

1. Maximum operational load 1 person, 300 lbs (136 kg).
2. Person under 40 inches tall (1.02 m) are not permitted on this ride.
3. Eyeglasses must be securely affixed to riders with head straps.
4. Swim wear with exposed zippers, buckles, rivets or metal ornamentation are not permitted.
5. Only one rider to enter the flume at a time. Single Riders only!
6. Never form chains.
7. Slide must be ridden feet first lying on your back with legs firmly crossed at the ankles and arms folded across the chest (to prevent elbows contacting the flume).
8. Riders must wait for the attendants start signal before starting the ride.
9. Do not uncross your legs or attempt to sit up until you come to a stop in the shutdown lane.
10. Do not run, dive, stand, kneel, rotate or stop in the slide.
11. At the end of the slide, obey all instructions by attendant and exit quickly.
12. CAUTION: For safety reasons, pregnant women and persons with heart conditions or back trouble should not ride this slide.

### 1.2 Shutdown lane

Signs should be posted at the shutdown lane to convey the following rules and regulations:

1. Do not block the end of the slide.
2. Leave the shutdown lane quickly and orderly.
3. No swimming or flotation devices allowed in the shutdown lane.

## 2. Attendants

Attendants should be alert to controlling crowd behavior, ensuring safe and orderly entry and exit and controlling the proper entry rate into the slide.

### 2.1 Attendant / top - 1 attendant per slide

This requirement may be relaxed to not less than one attendant per platform area or level, provided that the operator ensures that attendants are able to fulfill all duties as listed.

Duties:

1. Ask each rider if they know how to ride the ride.
2. Assure the rider is in the correct body position when ready.
3. Control dispatch of riders one at a time and shall not dispatch a rider until the flume is clear of obstruction and any previous rider.
4. Ensure all riders meet requirements.
5. Ensure eyeglasses are securely affixed to the riders.
6. Observe bathing suits for zippers, buckles, rivets, etc. and do not allow them on the slide.
7. Observe riders for any physical impairments that compromise safety and do not allow them on the slide.
8. Ensure the crowd behaves in a safe and orderly manner.
9. Monitor riders in areas visible from assigned positions.

### 2.2 Attendant / Shutdown Lane: 1 lifeguard per 2 slides

Duties:

1. Ensure customers conduct themselves in a safe and orderly fashion.
2. Do not allow riders to block the end of a slide. Delay dispatch of next rider if the slide landing area is obstructed.
3. Ensure that all riders exit the shutdown lane immediately upon splashdown. Do not permit guests to sit on or congregate around shutdown lane.
4. Be prepared to enter shutdown lane to assist customer out of lane.
5. Do not allow any swimming or flotation devices in shutdown lane.
6. Monitor water level and characteristics of the shutdown lanes. Shutdown lanes require extra attention to make sure water levels are at correct operating levels and flow transition has stabilized. Too little or too much depth in the shutdown lane will affect braking distance and characteristics.

7. Signal the dispatch attendant as to when it is okay to dispatch another rider when:
    i. **flume and shutdown lane are clear of previous riders and,**
    ii. **water level has recovered to marked level and,**
    iii. **flow transition is stable between markings!**

**3. Vehicles**

No vehicles are used in this slide. Patrons ride the slide in bathing suit attire according to instructions above.

**4. Water Flow**

Refer to attached mechanical drawing, A600, for design and commissioned water flows. Specific operational water flow values are determined at the time of commissioning by a WhiteWater representative. Any variations from flows after certification must be approved in writing by WhiteWater.

**32”AQUATUBE (32) & Poolsider Fusion into Shutdown Lane – Slide AC**

The primary operating concern in the 32”Aquatube into shutdown lane is the possibility of one riding customer colliding with another customer, either in the flume or in the shutdown lane. This type of occurrence can be minimized by the use of well-trained attendants controlling entry and exit conditions. Other safety considerations include: slips and falls in the entry and exit areas, abrasion from the sidewalls, and impact with the shutdown lane surface.

## 1. Posted Signs

### 1.1 Entry Station

Signs should be posted at the entry station of the ride to convey the following rules and regulations:

1. Maximum operational load 1 person, 300 lbs (136 kg).
2. Person under 40 inches tall (1.02 m) are not permitted on this ride.
3. Eyeglasses must be securely affixed to riders with head straps.
4. Swim wear with exposed zippers, buckles, rivets or metal ornamentation are not permitted.
5. Only one rider to enter the flume at a time. Single Riders only!
6. Never form chains.
7. Slide must be ridden feet first lying on your back with legs firmly crossed at the ankles and arms folded across the chest (to prevent elbows contacting the flume).
8. Riders must wait for the attendants start signal before starting the ride.
9. Do not uncross your legs or attempt to sit up until you come to a stop in the shutdown lane.
10. Do not run, dive, stand, kneel, rotate or stop in the slide.
11. At the end of the slide, obey all instructions by attendant and exit quickly.
12. CAUTION: For safety reasons, pregnant women and persons with heart conditions or back trouble should not ride this slide.

### 1.2 Shutdown lane

Signs should be posted at the shutdown lane to convey the following rules and regulations:

1. Do not block the end of the slide.
2. Leave the shutdown lane quickly and orderly.
3. No swimming or flotation devices allowed in the shutdown lane.

## 2. Attendants

Attendants should be alert to controlling crowd behavior, ensuring safe and orderly entry and exit and controlling the proper entry rate into the slide.

### 2.1 Attendant / top - 1 attendant per slide

This requirement may be relaxed to not less than one attendant per platform area or level, provided that the operator ensures that attendants are able to fulfill all duties as listed.

Duties:

1. Ask each rider if they know how to ride the ride.
2. Assure the rider is in the correct body position when ready.
3. Control dispatch of riders one at a time and shall not dispatch a rider until the flume is clear of obstruction and any previous rider.
4. Ensure all riders meet requirements.
5. Ensure eyeglasses are securely affixed to the riders.
6. Observe bathing suits for zippers, buckles, rivets, etc. and do not allow them on the slide.
7. Observe riders for any physical impairments that compromise safety and do not allow them on the slide.
8. Ensure the crowd behaves in a safe and orderly manner.
9. Monitor riders in areas visible from assigned positions.

### 2.2 Attendant / Shutdown Lane: 1 lifeguard per 2 slides

Duties:

1. Ensure customers conduct themselves in a safe and orderly fashion.
2. Do not allow riders to block the end of a slide. Delay dispatch of next rider if the slide landing area is obstructed.
3. Ensure that all riders exit the shutdown lane immediately upon splashdown. Do not permit guests to sit on or congregate around shutdown lane.
4. Be prepared to enter shutdown lane to assist customer out of lane.
5. Do not allow any swimming or flotation devices in shutdown lane.
6. Monitor water level and characteristics of the shutdown lanes. Shutdown lanes require extra attention to make sure water levels are at correct operating levels and flow transition has stabilized. Too little or too much depth in the shutdown lane will affect braking distance and characteristics.
7. Signal the dispatch attendant as to when it is okay to dispatch another rider when:
    i. **flume and shutdown lane are clear of previous riders and,**

i. **water level has recovered to marked level and,**
ii. **flow transition is stable between markings!**

### 3. Vehicles

No vehicles are used in this slide. Patrons ride the slide in bathing suit attire according to instructions above.

### 4. Water Flow

Refer to attached mechanical drawing, A600, for design and commissioned water flows. Specific operational water flow values are determined at the time of commissioning by a WhiteWater representative. Any variations from flows after certification must be approved in writing by WhiteWater.

**32”AQUATUBE (32) into shutdown Bowl - Slide AD**

The primary operating concern in the 32”Aquatube into shutdown Bowl is the possibility of one riding customer colliding with another customer, either in the flume or in the shutdown Bowl. This type of occurrence can be minimized by the use of well-trained attendants controlling entry and exit conditions. Other safety considerations include: slips and falls in the entry and exit areas, abrasion from the sidewalls, and impact with the shutdown Bowl surface.

## 1. Posted Signs

### 1.1 Entry Station

Signs should be posted at the entry station of the ride to convey the following rules and regulations:

1. Maximum operational load 1 person, 300 lbs (136 kg).
2. Person under 48 inches tall (1.22 m) are not permitted on this ride.
3. Eyeglasses must be securely affixed to riders with head straps.
4. Swim wear with exposed zippers, buckles, rivets or metal ornamentation are not permitted.
5. Only one rider to enter the flume at a time. Single Riders only!
6. Never form chains.
7. Slide must be ridden feet first lying on your back with legs firmly crossed at the ankles and hands clasped together behind head.
8. Riders must wait for the attendants start signal before starting the ride.
9. Do not uncross your legs or attempt to sit up until you come to a stop in the shutdown lane.
10. Do not run, dive, stand, kneel, rotate or stop in the slide.
11. At the end of the slide, obey all instructions by attendant and exit quickly.
12. CAUTION: For safety reasons, pregnant women and persons with heart conditions or back trouble should not ride this slide.
13. CAUTION: When exiting Bowl walk carefully on surface. It is slippery!

### 1.2 Shutdown bowl

Signs should be posted at the shutdown bowl to convey the following rules and regulations:

1. Do not block the end of the slide.
2. Leave the shutdown bowl quickly and orderly.
3. No swimming or flotation devices allowed in the shutdown bowl.

## 2. Attendants

Attendants should be alert to controlling crowd behavior, ensuring safe and orderly entry and exit and controlling the proper entry rate into the slide.

### 2.1 Attendant / top - 1 attendant per slide

This requirement may be relaxed to not less than one attendant per platform area or level, provided that the operator ensures that attendants are able to fulfill all duties as listed.

Duties:

1. Ask each rider if they know how to ride the ride.
2. Assure the rider is in the correct body position when ready.
3. Control dispatch of riders one at a time and shall not dispatch a rider until the flume is clear of obstruction and any previous rider.
4. Ensure all riders meet requirements.
5. Ensure eyeglasses are securely affixed to the riders.
6. Observe bathing suits for zippers, buckles, rivets, etc. and do not allow them on the slide.
7. Observe riders for any physical impairment that compromise safety and do not allow them on the slide.
8. Ensure the crowd behaves in a safe and orderly manner.
9. Monitor riders in areas visible from assigned positions.

### 2.2 Attendant / Shutdown bowl: 1 lifeguard per slide

Duties:

1. Ensure customers conduct themselves in a safe and orderly fashion.
2. Do not allow riders to block the end of a slide. Delay dispatch of next rider if the slide landing area is obstructed.
3. Ensure that all riders exit the shutdown bowl immediately upon splashdown. Do not permit guests to congregate around shutdown bowl.
4. Be prepared to enter shutdown bowl to assist customers.
5. Do not allow any swimming or flotation devices in shutdown bowl.

## 3. Vehicles

No vehicles are used in this slide. Patrons ride the slide in bathing suit attire according to instructions above.

## 4. Water Flow

Refer to attached mechanical drawing, A601, for design and commissioned water flows. Specific operational water flow values are determined at the time of commissioning by a WhiteWater representative. Any variations from flows after certification must be approved in writing by WhiteWater.

**SPEED SLIDE / FREEFALL/ HIGH SPEED waterslides (32, RS, SHUT) into shutdown lane, Slide AF**

The primary operating concern in the Speed Slide, Freefall and other high speed waterslides is to ensure the riders assume the correct riding position. In addition to written instructions below we recommend a pictorial representation of rider position on walkways leading to the slide, and at the top platform.

**1. Posted Signs**

**1.1 Entry Station:**

Signs should be posted at the entry station of the ride to convey the following rules and regulations:

1. Maximum operational load 1 person, 45-300 lb. (20.4-136.4 kg).
2. Persons under 48 inches (1.22 m) tall or persons greater than 76 inches (1.93 m) are not permitted on this ride.
3. Eyeglasses must be securely affixed to riders with head straps.
4. Swimwear with exposed zippers; buckles, rivets or metal ornamentation are not permitted.
5. Only one rider to enter the flume at a time. Single Riders only!
6. Never form chains.
7. Slide must be ridden feet first lying on your back with legs firmly crossed at the ankles and arms folded across the chest. Riding this slide improperly may cause injury.
8. Riders must wait for the attendants start signal before starting the ride.
9. Do not uncross your legs or attempt to sit up until you come to a stop in the shutdown lane.
10. Do not run, dive, stand, kneel, rotate or stop in the slide.
11. At the end of the slide, obey all instructions by shutdown lane attendant and exit quickly.
12. CAUTION: For safety reasons, pregnant women and persons with heart conditions or back trouble should not ride this slide.

**1.2 Shutdown lane:**

Signs should be posted at the shutdown lane of the ride to convey the following rules and regulations:

1. Do not block the end of the slide.

2. Leave the shutdown lane quickly and orderly.
3. No swimming or flotation devices allowed in the shutdown lane.

## 2. Attendants

Attendants should be alert to controlling crowd behavior, ensuring safe and orderly entry and exit and controlling the proper entry rate into the slide.

### 2.1 Attendant / top - 1 attendant per slide

Duties:

1. Ensure the crowd behaves in a safe and orderly manner.
2. Ensure all riders meet requirements.
3. Ensure eyeglasses are securely affixed to the riders.
4. Observe bathing suits for zippers, buckles, rivets, etc. and do not allow them on the slide.
5. Observe riders for any physical impairment that compromise safety and do not allow them on the slide.
6. Ensure all riders are in proper riding position before dispatching.
7. The attendant shall dispatch riders one at a time and shall not dispatch a rider until the slide landing area is clear of obstruction and any previous riders.
8. Monitor riders in areas visible from assigned positions.

### 2.2 Attendant / shutdown lane: 1 lifeguard per two slides

Duties:

1. Ensure customers conduct themselves in a safe and orderly fashion.
2. Do not allow riders to block the end of a slide. Delay dispatch of next rider if the slide landing area is obstructed.
3. Ensure that all riders exit the shutdown lane immediately upon splashdown. Do not permit guests to sit on or congregate around shutdown lane.
4. Be prepared to enter shutdown lane to assist customer out of lane.
5. Do not allow any swimming or flotation devices in shutdown lane.
6. Monitor water level and characteristics of the shutdown lanes. Shutdown lanes require extra attention to make sure water levels are at correct operating levels and flow transition has stabilized. Too little or too much depth in the shutdown lane will affect braking distance and characteristics.
7. Signal the dispatch attendant as to when it is okay to dispatch another rider: when
    i. flume and shutdown lane are clear of previous riders and,
    ii. water level has recovered to marked level and,
    iii. flow transition is stable between markings!

### 3. Vehicles

No vehicles are used in this slide. Patrons ride the slide in bathing suit attire according to instructions above.

### 4. Water Flow

Refer to attached mechanical drawing, A601, for design and commissioned water flows. Specific operational water flow values are determined at the time of commissioning by a WhiteWater representative. Any variations from flows after certification must be approved in writing by WhiteWater.

(iii) PART III MAINTENANCE GUIDELINES

## Part III MAINTENANCE GUIDELINES FOR FRP FLUME

If properly maintained, your waterslide will give you years of service and keep sliding the way it was meant to - SAFE and FUN. By keeping the slide and its components properly maintained, you will be ensuring high performance and long life.

### 1. Cleaning

Maintenance requires removal of surface dirt, grease and suntan oil by cleaning the flumes with a soft-bristled brush and mild detergent such as 3M - “Multi Purpose Boat Soap”. For hard water buildup (a white chalky discoloration) removal/maintenance use “C.L.R.” or other cleaners specific for this purpose. For removal of difficult stains use a cut polish or rubbing compound and finish wax or a combination product such as 3M “Marine One-Step Fiberglass Restorer and Wax”.

### 2. Waxing

At least twice each year, the fiberglass finish should be waxed and buffed with high quality paste wax or polish such as 3M “Marine One-Step Fiberglass Restorer and Wax”. On scratched, dull or faded areas use a fine buffing compound to restore the original gloss before waxing. Prolonged exposure to the ultra-violet rays of the sun can in time, cause discoloring and fading. We recommend using paste waxes or polishes containing ultra-violet screens. The more often the surface is waxed, the longer it will last.

**CAUTION**: If you use power tools for buffing or polishing, use extreme care to prevent overheating the surface. Overheating a rubbing compound burns small gritty particles into the slide surface causing blistering and streaking. This may require the area to be sanded and repainted.

### 3. Joints

Slide joints play an important role in rider comfort and pleasure. Proper maintenance will keep the joints smooth and trouble free for years.

#### 3.1 Joint Caulking

All fiberglass sections will expand and contract with temperature changes. Therefore, joints between sections are filled with a flexible, elastic caulking. Should the joints need re-caulking, all the old filler should be removed, the fiberglass should be cleaned and joints should be re-filled using a flexible polyurethane sealant. **DO NOT** use plastic filler that will harden. **Under no circumstances should the joints be fiberglassed over.** Excess joint caulking should be removed from the slide surface by scraping it off with a putty knife. Any remaining traces should be wiped off with lacquer thinner applied to a rag. Do not pour lacquer thinner directly onto a flume joint as it can dissolve the sealant.

### 3.2 Joint Roughness

Joints may become rough with use, especially if metal articles are allowed down the slide. For minor chips and cracks, the joints may be fixed using the procedures outlined in Part III, Section 4.
More serious cases may require power sanding that will cut through the gelcoat. This will require a spray application of new gelcoat by a trained person, finished by sanding and polishing and waxing as outlined in Part III.

## 4. Patching

Chips and cracks may appear in fiberglass flumes from normal usage. The following sections outline procedures to repair minor damage to slides. Due to the hazardous nature of materials used and variability of application methods, we recommend that a qualified fiberglass laminator perform the repairs.

### 4.1 Minor Chips and Cracks

In areas that have chips or cracks in the gelcoat only, or have a scratch that is deep enough to penetrate through the gelcoat to the fiberglass but not deep enough to go completely through the laminate, follow the procedures given in Part III, Section 4.4.
**NOTE:** For damage that penetrates completely through or deep into the laminate, we recommend that a qualified fiberglass laminator perform the repairs.

### 4.2 Surface Cracks

Hairline cracks, sometimes called spider webbing, or star cracks may develop in the gelcoat or surface coating of the fiberglass product. This is caused by a combination of weathering, vibrations, and/or impacts. Although unsightly, they do not necessarily affect structural strength. The hairline cracks can be fixed by sanding out the affected area with 100 grit sandpaper and re-coating the surface with gelcoat. Follow the patching instructions in Part III, Section 4.4.3, omitting steps 4 through 6.

### 4.3 Cracks around Flanges

The area around the flanges of flumes contains a thick layer of gelcoat which is very stiff. Stresses from normal use may cause cracks in the gelcoat around the flanges. These are not structural cracks. Flange cracks may be remedied by sanding the affected area with 100 grit sandpaper and re-coating with gelcoat. Follow the patching instructions in Part III, Section 4.4.3, omitting steps 4 through 6.

## 4.4 Repair Procedures

**WARNING:**

Patching kits contain toxic, combustible and corrosive elements. Use only under well ventilated conditions. Do not inhale fumes. Seek medical attention if polyester resins are swallowed or inhaled. Should contact occur with the eye flush with water for 15 minutes and seek medical attention. If person is wearing contact lenses and the lenses did not flush out from the water, have the person try to remove AFTER the flushing procedure. If contents come in contact with skin or clothing, clean the area immediately with acetone.

Before you start, you will need:

1. Sandpaper: 36 - 100 grit; 220 - 320 grit wet and dry; 600 grit wet and dry
2. Sanding block
3. Acetone
4. 2" masking tape
5. Utility knife
6. Putty knife
7. Mixing board
8. Mixing cup
9. Fiberglass resin hardener (catalyst), use a peroxide based catalyst (MEKP)
10. Patching compound
11. Gelcoat paint
12. 2" fine paint brush
13. Automotive cut polish
14. High quality paste wax such as "Turtle" wax

### 4.4.1 Storage Instructions

Store uncatalyzed patching compound and gelcoat in closed metal containers in a cool area below 73° Fahrenheit (23° Celsius) out of direct sunlight. Do not allow to freeze.

Store liquid catalysts in their original containers according to manufacturer's instructions.

### 4.4.2 Mixing Instructions

Mix only small amounts at one time. The mixtures will harden in twenty (20) minutes to 1 hour, depending on the temperature and the amount of catalyst added. The mixture will harden faster at higher temperatures and with increasing amounts of catalyst added. Use caution when adding catalyst, over catalyzing will result in the mixture cracking. Do not pour catalyzed mixtures back into the can. Do not reduce materials with a "conventional" paint or lacquer thinner.

**Patching Compound:** Add one (1) part catalyst to one hundred (100) parts patching compound on the mixing board. Mix well.
**Gelcoat:** Add one (1) part catalyst to one hundred (100) parts gelcoat in the mixing cup. Mix well.

### 4.4.3 Patching Instructions

1 Sand area to be patched with 36 -100 grit sandpaper. Feather sand to moulded surface and remove all rough edges.
2 Wash area clean with acetone and allow to dry.
3 Mask off area to be patched with 2" masking tape.
4 Using a putty knife, spread the patching compound smoothly over the prepared area to the top of the tape.

**NOTE:** Area must be dry and clear of contaminants, such as dirt and sanded particles, etc.

5 Keep the patched area dry and allow 20 minutes to 1 hour to harden.
6 After the patch has hardened, sand the patched area flush to the surrounding surface with 100 grit sandpaper.

**NOTE:** Sanding will remove the masking tape. Re-tape the area before painting.

7 Using a 2" fine paint brush, paint the area with gelcoat. Allow twenty (20) minutes to one (1) hour to dry.

**NOTE:** The paintbrush and tools can be cleaned with acetone.

8 After the gelcoat has dried, remove the masking tape. Using a sanding block, wet sand with 220 - 320 grit sandpaper. Repeat with 600 grit sandpaper.
9 Buff painted surface with auto cut polish and wash clean with water.
10 Wax and buff painted surface with a high quality paste wax.

(iv) PART IV

# SUPPLEMENT TO MANUAL FOR ASTM STANDARDS

## PART IV SUPPLEMENT TO MANUAL FOR ASTM STANDARDS

### 1. The ASTM standard F 2376-XX Standard Practice for Classification, Design, Manufacture, Construction, and Operation of Water Slide Systems.

The ASTM standard F 2376 for Water Slide Systems is a standard developed specifically to cover Water Slide systems. The standard references several other standards which together form the basis of a complete standard for the Design, Manufacture, Construction and Operation of Water Slide Systems. Operators are encouraged to become active members of the ASTM F24 group. The fees are nominal and provide access to the relevant standards. Operators should be aware of these standards and the responsibilities outlined within them.

**General Description of Rides**
Waterslides use the flow of water to propel or lubricate the movement of riders down a fixed fiberglass flume section. The riders may ride alone with no vehicle, in groups on specially designed inflatable inner tubes or on a custom made inflatable boat or raft. The riding configuration depends on the specific product and the method of riding.

**Description of Motion**
Waterslide flumes are fixed in position and do not move. Propulsion is from gravity aided by water flow in the flume. Riders with or without vehicles will experience motion and accelerations consistent with the flume path. Movements include right and left turns, vertical curves, and deceleration at the finish. Riders or vehicles shall maintain constant contact with the flume ride surface.

**Operational Restrictions Due to Weather**
**Wind** - Waterslide structures are designed to withstand wind loads specified in the building code in force for the ride locations. WhiteWater recommends suspending operation during sustained winds in excess of 40 mph (64 kph).
**Lightning** - Virtually all waterslides use elevated towers as starting platforms. Operation of rides should be suspended during any storm or weather conditions where lightning may occur.
**Rain** - Rain will have no effect on the operation of the slides, with one exception. All flumes rely on the cushioning and braking action of the specified water flow. Rain water can create a very slippery surface and without the braking action of the larger water flow can create an extremely hazardous condition. Under no circumstances should the slides be operated without the main water supply running at specified capacity.

**Safe water flow**
The water flow rate is important to the safe operation of the ride. Operators shall make sure that the water supply is adequate. Insufficient water volume can result in higher speed. The water tends to restrain and cushion motions and impacts as well as reduce speed.

**Evacuation and Emergency Procedures**
In an emergency situation affecting the slide:

1 Top attendants shall cease dispatch of all riders.
2 If water flow is impeding the remedy of the emergency situation, use E-stop to turn off power to the pump(s).
3 Riders in the slide shall continue down the slide and exit normally if possible.
4 Attendants shall ensure all riders have exited the slide either through the bottom or at egress locations.
5 Patrons may remain queued on tower and stairs if they are not affecting the emergency situation.
6 If necessary to evacuate the tower, patrons shall be guided by top attendant to exit via the stairs from the start tower or egress location.
7 Slide should remain closed until cause of emergency situation is investigated and resolved.
8 In case of serious injuries or problems, operator should notify manufacturer and other regulatory bodies as required by law.

## 2. The ASTM standard F 853 - XX Standard Practice for Maintenance Procedures for Amusement Rides and Devices.

The ASTM Standard F 853 for Amusement Rides and Devices is a broad-based standard covering all the various rides and attractions encountered in the amusement industry. Most of the requirements are directed at complex mechanical devices that are subject to wear. These devices may have critical connectors and linkages that must be inspected regularly to avoid catastrophic failure. Waterslides in general are quite simple. The following is WhiteWater's requirement for inspection of waterslides to conform to ASTM. These are to be used in conjunction with WhiteWater's Operation & Maintenance Manual.

**Operational Tests of Critical Operating Items**
Waterslides use water pumped into the starting area of the ride to operate. The water volume is important to safe operation of the ride. In general, the less water volume pumped, the faster the rider will travel. If during operation, the water supply is restricted or fails, operators shall suspend operations when water volume is below specified operating requirements. A basic operational test should be performed daily in accordance with the Waterslides Operations & Maintenance Manual.

Inspection of the fiberglass and sliding surface must be made daily in accordance with the Waterslides Operations & Maintenance Manual. Small chips or surface imperfections may cause injury to riders.

**Recommended Maintenance/Inspection**

The daily inspection of the slides is detailed in the Waterslides Operations & Maintenance Manual Part I - Section 3 and Part III - Section 1, which covers the operational components of the slide. The only other items that should be inspected are the supporting structures for the slides and start platforms.

Inspection of supporting structures:

- Steel structures that are hot dipped galvanized will require visual inspections on a semiannual basis. Areas around field welds should be carefully checked and touched up with zinc rich paint as necessary. If rust streaking occurs, the source should be identified and attended to. If steel structures are ten years old or greater, a comprehensive professional inspection should be performed.
- Steel structures that are painted without galvanizing should be visually inspected on an annual basis. If steel structures are five years old or greater, a comprehensive professional inspection should be performed.
- Wood structures should be visually inspected annually for integrity, tightness of fasteners and general condition. If wood structures are over five years old, a comprehensive professional inspection should be performed.

Climactic and operation conditions vary greatly and will affect the interval times above. In more corrosive environments such as seaside or some indoor installations, the interval times should be reduced.

Other routine checks completed annually:

- All concrete filled stairs and decks should be visually inspected for worn finishes on the nosing and cracked concrete. The underside of the metal decking should be checked for deterioration.
- All welds should be visually inspected for condition and all bolts should be snug.
- Anchor bolts should be checked for tightness and corrosion. Grout around base plates should be in good condition.
- Inspection and maintenance of fiberglass should be performed as per the WhiteWater Operations & Maintenance Manual Part III.

Comprehensive professional inspections should be performed by a qualified engineering or inspection firm. They perform inspections with methods they deem appropriate to assure accurate review of the structure. These methods may include non-destructive testing using ultrasound or other techniques. Inspection would include condition of metal components, welds, bolts, and any other critical items. The inspecting agency should produce a certificate of inspection and/or a report on condition for review by a qualified engineer.

**Fiberglass Wear Limits**
The fiberglass should be inspected regularly as per the WhiteWater Operations & Maintenance Manual Part I - Section 3 and Part III - Section 1. The riding surface of the flume is subject to wear and weathering. The exterior of the slide is subject to weathering. The fiberglass should be inspected professionally if five years old or older.

**Other Wear Limits**
Rides using boats will experience wear on the boats. If the wear is excessive it may impair the function of the boat and operation of the ride. This is especially true if the ride uses shutdown lanes. The wear should be checked in accordance with the boat manufacturer's recommendations.

**Replacement Fasteners**
All replacement fasteners shall conform to the standards specified in the engineering drawings.

**Electrical / Mechanical Systems Operation and Maintenance**
All electrical motors, pumps, controls etc. shall be inspected and maintained in accordance with their manufacturer's recommendations.
All pump intake grating or screens must be inspected to ensure that no structural flaw is evident.
**Note:** Whenever inspection or maintenance work is being done on electrical/mechanical systems, including pump intake grating, all related equipment must be electrically isolated using recognized equipment lock out procedures.

## Appendix 1-I

TYPICAL DAILY WATER QUALITY LOG

**Location:** _____ **Date:** _____

**Weather:** _____

| WATER TEST | | | | FILTER CHECK | | |
|---|---|---|---|---|---|---|
| ***Time*** | ***Chlorine Count*** | ***pH*** | ***Water Clarity*** | ***Backwash*** | ***Temperature*** | ***Initial*** |
| **10:** | | | | | | |
| **11:** | | | | | | |
| **12:** | | | | | | |
| **13:** | | | | | | |
| **14:** | | | | | | |
| **15:** | | | | | | |
| **16:** | | | | | | |
| **17:** | | | | | | |
| **18:** | | | | | | |
| **19:** | | | | | | |
| **20:** | | | | | | |
| **21:** | | | | | | |
| **22:** | | | | | | |
| **23:** | | | | | | |
| **24:** | | | | | | |

## Appendix 1-II

TYPICAL FIRST AID REPORT

| | | | |
|---|---|---|---|
| **First Name of Victim:** | **Middle Initial:** | **Name of Person Filling Report:** | |
| **Last Name:** | | **Location Address:** | |
| **Mailing Address:** | | **City:** | **State/Province:** |
| **City:** | **State/Province:** | **Zip/Postal Code:** | **Location Phone #:** |
| **Zip/Postal Code:** | **Phone #:** | **Location Name:** | |

| | | | | | |
|---|---|---|---|---|---|
| **Date (MM/DD/YY) and Time of injury** | (month) | (day) | 20 | , at | a.m. / p.m. |
| **Date and Time Injury Reported to First Aid Attendant** | (month) | (day) | 20 | , at | a.m. / p.m. |
| **Location of Accident:** | | | | | |
| **What Happened – Victim Statement:** | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **Name of Witness:** | | | | | |
| **Witness Mailing Address:** | | | | | |
| **City:** | **State/Province:** | **Postal Code:** | | | |
| **What Happened – Witness Statement:** | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **First Aid Attendant Description of Injury:** | | | | | |
| | | | | | |
| | | | | | |
| **Was an Ambulance called (circle) Yes / No** | **Manager on Duty:** | | | | |
| **Manager Statement:** | | | | | |
| | | | | | |
| | | | | | |
| I hereby certify that the above statement is true to the best of my knowledge. | | | | | |
| | | | | | |
| **Victim Signature** | **Witness Signature** | **First Aid Attendant Signature** | **Manager on Duty Signature** | | |

## Appendix 1-III

EMERGENCY PHONE NUMBERS

| | | | |
|---|---|---|---|
| **Location Name:** | | **Location Phone:** | |
| **Location Address:** | | | |

**DIAL 911 for Police, or Medical Emergency (if available in your area)**

| **EMERGENCY SERVICES** | | | |
|---|---|---|---|
| **Police:** | | **Sheriff:** | |
| **Hwy Patrol:** | | **Ambulance:** | |
| **PLUMBER** | | **VENDING MACHINE COMPANY** | |
| **Company Name:** | | **Company Name:** | |
| **Contact Name and Phone:** | | **Contact Name and Phone:** | |
| **Secondary Contact Name and Phone:** | | **Secondary Contact Name and Phone:** | |
| **GENERAL CONTRACTOR** | | **WATERSLIDE MANUFACTURER** | |
| **Company Name:** | | **Company Name:** | **WhiteWater West Industries Ltd.** |
| **Contact Name and Phone:** | | **Contact Name and Phone:** | 604-273-1068 |
| **Secondary Contact Name and Phone:** | | **Secondary Contact Name and Phone:** | |
| **ELECTRICIAN** | | | |
| **Company Name:** | | **Company Name:** | |
| **Contact Name and Phone:** | | **Contact Name and Phone:** | |
| **Secondary Contact Name and Phone:** | | **Secondary Contact Name and Phone:** | |
| **SWIMMING POOL SUPPLY** | | | |
| **Company Name:** | | **Company Name:** | |
| **Contact Name and Phone:** | | **Contact Name and Phone:** | |
| **Secondary Contact Name and Phone:** | | **Secondary Contact Name and Phone:** | |

## ADDENDUM: SHUTDOWN LANE FLOW TRANSITION DATA RECORDING SHEET, FREE FALL, SLIDE AF

| | FINAL MEASUREMENTS |
|---|---|
| **FLOW RATE** | 240 20 GPM |
| **DIMENSION-A (SPECIFY UNITS)** | 6 IN |
| **DIMENSION-B (SPECIFY UNITS)** | 78 FT. |
| **DIMENSION-C (SPECIFY UNITS)** | 2 IN |

CAUTION - HYDRAULIC LOCATION IS FOR REPRESENTATION PURPOSES ONLY. FINAL HYDRAULIC LOCATION TO BE DETERMINED DURING COMMISSIONING.

DIMENSION B

**G**

1121

3000
TYP (x8)

## OPERATING WATER DEPTH MEASUREMENT LOCATIONS

**H**

1500
TYP (x2)

DIMENSION A (WATER DEPTH)

DIMENSION C (WATER DEPTH)

DIMENSION C IS THE MINIMUM DISTANCE FROM THE HYDRAULIC TRANSITION WHERE AN ACCURATE READING CAN BE TAKEN.

**DETAIL G**

MEASURE
1'-0"
300
AWAY FROM JOINT

**DETAIL H**

| REV | REVISION DESCRIPTION/ISSUE RECORD | DATE | PE |
|---|---|---|---|
| A | UPDATED WITH FINAL MEASUREMENTS | MAR 20 2018 | RS |
| 0 | RELEASED | JUN 06 2017 | CB |

| | | | |
|---|---|---|---|
| DESIGNED BY: CB | DATE: JUN 05 2017 | PROJ. ENG. CHECK: CB | DATE: JUN 06 2017 |
| DRAWN BY: SJ | DATE: JUN 06 2017 | DRAFTING CHECK: CB | DATE: JUN 06 2017 |
| SCALE: 1:60 | | ARCHIVE FILE No: | |

NOTE:- METRIC MM IMPERIAL [IN]

METRIC DIMENSIONS

WHITE WATER

WhiteWater West Industries Ltd
6700 McMillan Way, Richmond, B.C. Canada V6W 1J7

| | |
|---|---|
| **PROJECT NAME** | EMERALD GLEN AQUATIC CENTER |
| **PROJECT NUMBER** | 31548 |
| **SLIDE NUMBER** | AF |
| **CERTIFIER** | ANDY MULLIGAN |

| | |
|---|---|
| | |
| | ± |
| | |
| | |
| | |

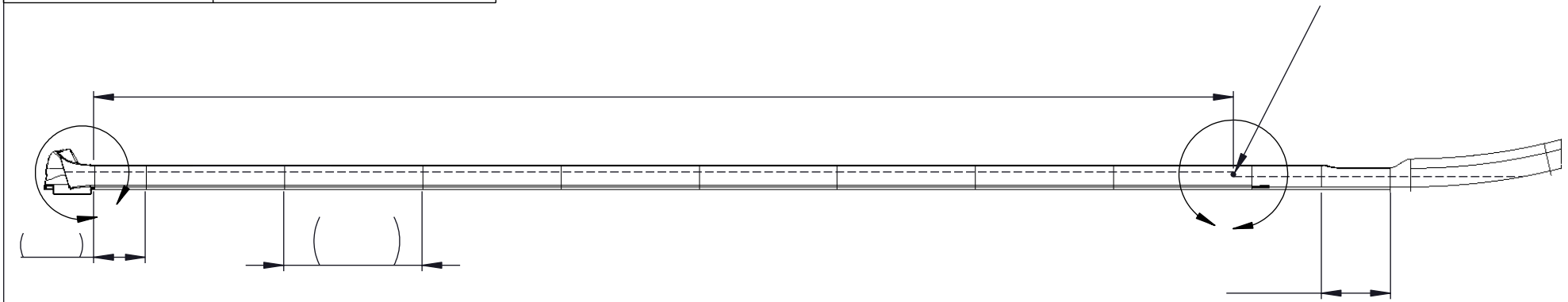
Tel (604) 273-1068 Fax (604) 273-4518

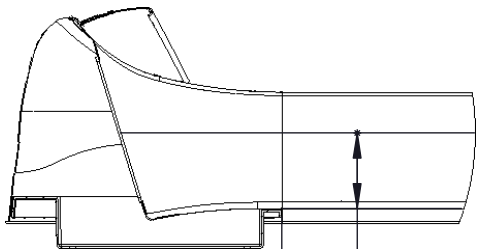
**CERTIFIER DATE** 12-MAR-2018

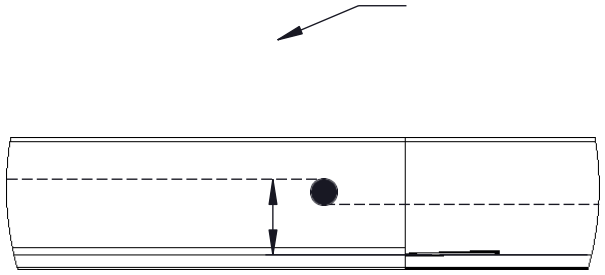
SHUTDOWN LANE FLOW TRANSITION
DATA RECORDING SHEET

EMERALD GLEN AQUATIC CENTER

| PROJECT No | DRAWING No | REVISION |
|---|---|---|
| 31548 | 31548-AF-S1270 | A |







[ ]

| | |
|---|---|
| | |
| | |
| | |
| | |

FILE : C:\Slides1\Projects\31548 Emerald Glen Aquatic Center\Documents\Shutdown Lane Drawings\31548-AF-S1270-SHUTDOWN-LANE-FLOW-TRANSITION
LAST SAVED BY : rick.sebulsky , ON Tuesday, March 20, 2018 1:57:39 PM
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## ADDENDUM: PROCEDURE FOR ANNUAL OPERATIONAL TESTING OF WATERSLIDE

| PROCEDURE | | | WHITEWATER | |
|---|---|---|---|---|
| PROJECT NO. | DOCUMENT NO. | REVISION | CREATED BY | DATE |
| - | 428676 | X3 | R.S. | 2017-07-06 |
| | | | APPROVED BY | DATE |
| | | | C.B. | 2018-03-05 |
| TITLE | | | | |
| PROCEDURE FOR ANNUAL OPERATIONAL TESTING OF WATERSLIDE | | | | |

## 1.0 (v) OBJECTIVE

The objective of this procedure is to outline the procedure for the Owner/Operator to perform annual operational testing on their slide to ensure that it's operating within its prescribed operational limits.

## 2.0 (vi) SCOPE

The scope of this document is limited to high speed body slides with shutdown lanes.

## 3.0 (vii) PROCEDURE FOR OPERATIONAL TESTING

This section will outline the procedure for the Owner/Operator to perform **annual** operational testing on their slide to ensure that it's operating within its prescribed operational limits set during commissioning.

1. Inspect the slide surface and joints for defects such as chips and cracks. Perform remedial work as necessary.

2. To ensure optimal slide performance, the slide surface must be clean and free of scale and residue. Clean and wax the slide surface, per the O&M, if the slide surface is compromised.

3. Turn on the slide pumps. Ensure valve lockout tags installed during commissioning are still in place and haven't been tampered with. Verify that all flow meters are functional and reading within the prescribed range documented within the completed "shutdown lane flow transition data recording sheet" for the given slide.

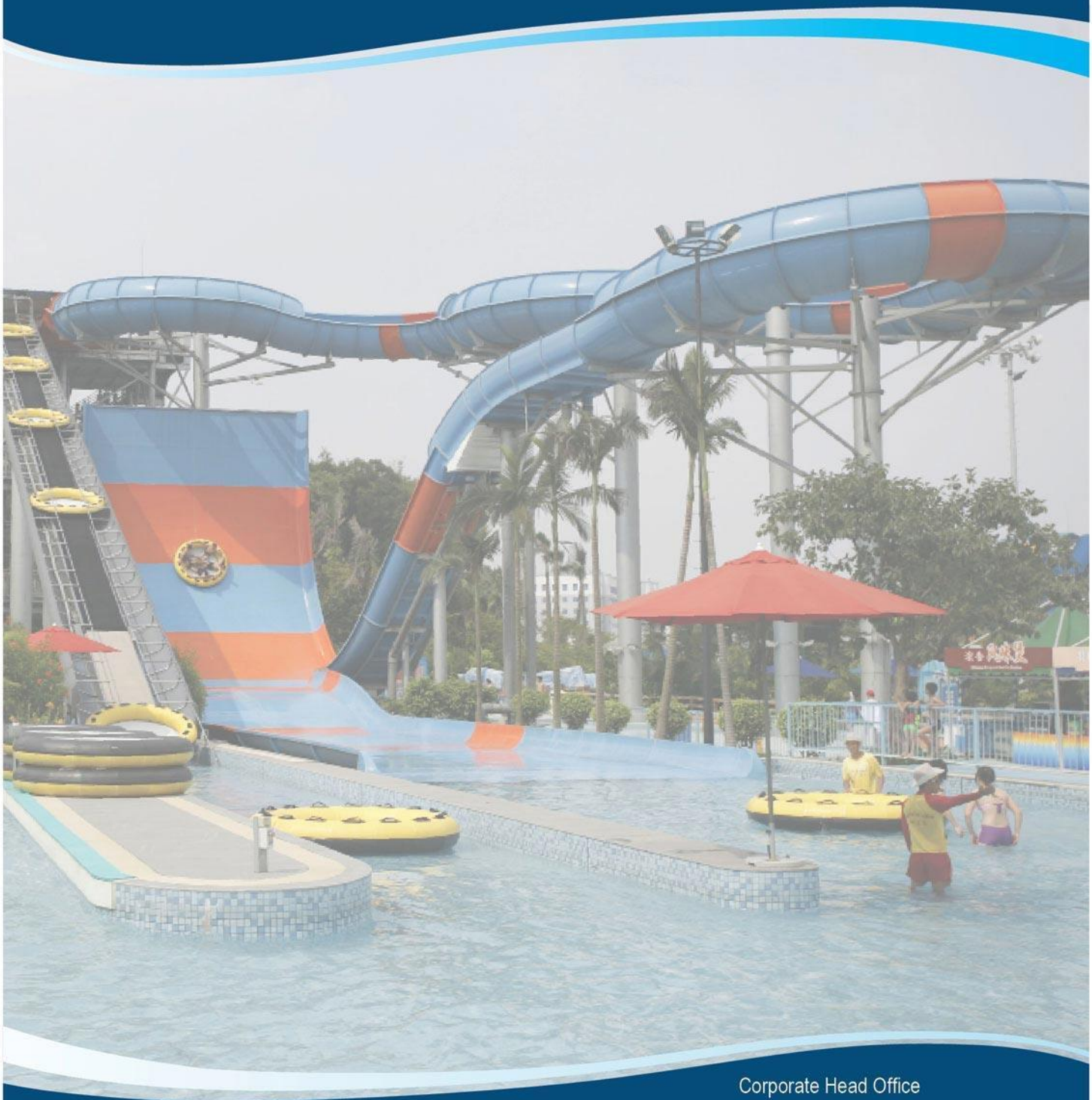
4. Inspect the shutdown lane settings. Ensure that the flow transition is approximately centered within the flow transition markers, and that the water depth at the end of the shutdown lane is at the height of the depth marker set during commissioning. Refer to the completed "shutdown lane flow transition data recording sheet" for commissioning settings.

5. Document all slide settings; including slide surface quality, flow rate, location of flow transition, weir height, and depth of water in the shutdown lane.

## 4.0 (viii) REFERENCE

Refer to the "shutdown lane flow transition data recording sheet" completed for the given slide during commissioning. This sheet provides the final, commissioned flow, depth and transition location measurements.

WHITEWATER.



Corporate Head Office

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6700 McMillan Way • Richmond • BC
V6W 1J7 • Canada
www.whitewaterwest.com
Tel: +1-604-273-1068 Fax: 604-273-4518

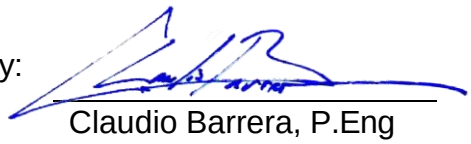
# Waterslides Operations & Maintenance Manual

Prepared for:
Emerald Glen Aquatic Center – Slide AE (AquaDrop Slide)
Dublin, CA

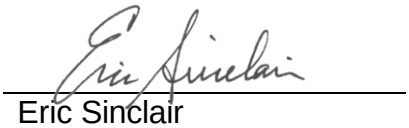
Project No. 31548

Date: April 26, 2018

Reviewed and submitted by:



Claudio Barrera, P.Eng



Eric Sinclair
Project Manager

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Project No. 31548 Drawing No. A200 Engineering Issued Dated December 1, 2015

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Project No. 31548 Drawing No. S290 Engineering Issued Dated December 1, 2015


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ADDENDUM: PROCEDURE FOR ANNUAL OPERATIONAL TESTING OF WATERSLIDE

ADDENDUM: MECHANICAL DRAWINGS

# Slide Information details

Emerald Glen Aquatic Center, Dublin, California, Project # 31548

| | 1 |
|---|---|
| Ride Serial Number | 31548 - AE |
| Date of Manufacture | 2016 |
| Ride Name | AquaDrop |
| Product Family | Version 6 (Rev F) |
| Ride Speed | maximum 48.6 feet per second |
| Water Flow | design 370 US gallons per minute |
| Passenger Capacity by Weight | 300 pounds |
| Passenger Capacity by Number | one person |
| Minimum Rider Height | 48 inches |
| Vehicle Type | novehicles |
| Patent Number | www.whitewaterwest.com |

NOTES:

1. FOR GENERAL NOTES AND SPECIFICATIONS SEE DWG 130.

LEGEND:

- INDICATES YOKE LOCATION
- INDICATES COLUMN LOCATION

SHUTDOWN LANE

SHUTDOWN LANE

SHUTDOWN LANE

BIORETENTION

TAIN MARKINGS AND WATER LEVELS AS PER DRAWING S290

SLIDE PATH LAYOUT

SCALE 1/8"=1'-0"

| REV | REVISION DESCRIPTION/ISSUE RECORD | DATE |
|---|---|---|
| 0 | ISSUED FOR CONSTRUCTION | DEC. 01/2015 |
| | REVISED AS NOTED | OCT. 19/2015 |
| | REVISED AS NOTED | SEP. 30/2015 |
| | REVISED AS NOTED | SEP. 25/2015 |
| I | REVISED AS NOTED | SEP. 14/2015 |
| | ISSUED FOR INFORMATION | AUG. 20/2015 |

| | | | |
|---|---|---|---|
| DESIGNED BY | RP | DATE AUG 20/2015 | PROJ. ENG. CHECK / DATE |
| DRAWN BY | KS | DATE AUG 20/2015 | DRAFTING CHECK / DATE |
| SCALE | | | ARCHIVE FILE No 31548A200 |

NOTE:- IMPERIAL DIMENSIONS
ALL ELEVATIONS AND CO-ORDINATES ARE IN FEET
ALL OTHER DIMENSIONS ARE IN FEET AND INCHES


WHITE WATER

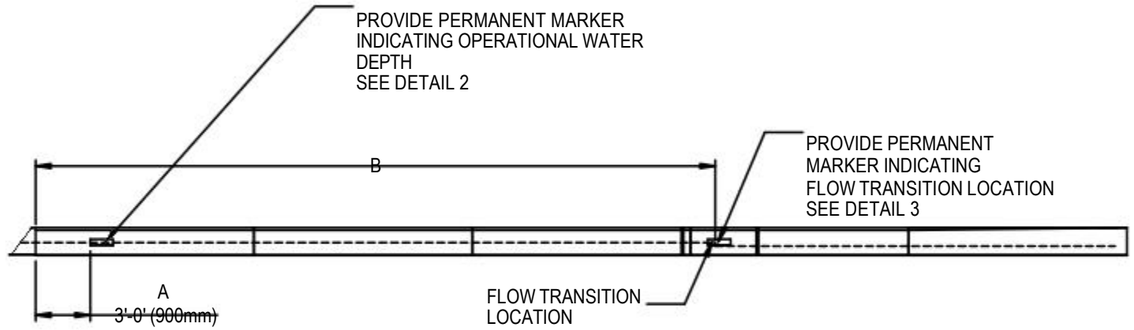
WhiteWater West Industries Ltd
6700 McMillan Way, Richmond, B.C. Canada V6W 1J7
Tel (604) 273-1068 Fax. (604) 273-4518


GROUP A
SLIDE PATH LAYOUT

**EMERALD GLEN AQUATIC CENTER**
DUBLIN, CALIFORNIA, UNITED STATES

| PROJECT No | DRAWING No | REV |
|---|---|---|
| 31548 | A200 | 0 |

NOTE:
AFTER CERTIFICATION
MEASURE "A" & "B" AND
PROVIDE MARKERS FOR
ALL TYPES OF SHUTDOWN LANE
AS SHOWN IN DETAIL 2 & 3.



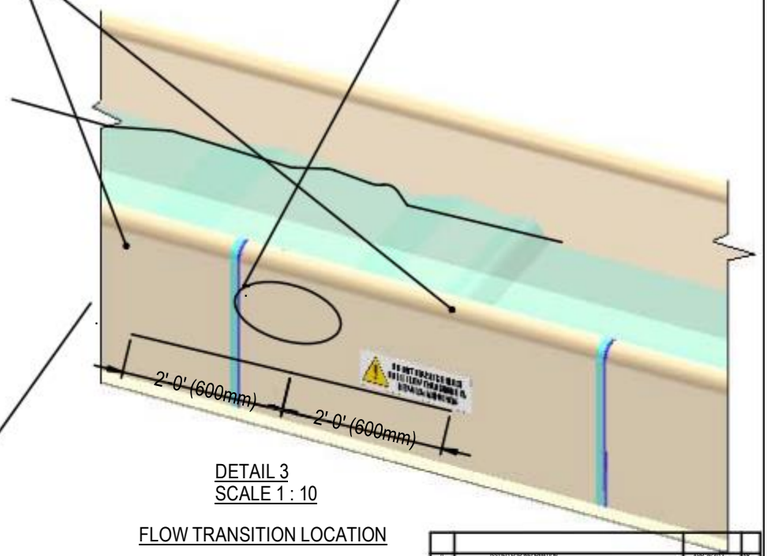

ELEVATION - SHUTDOWN LANE

NOTE:
1. FOR GENERAL NOTES AND SPECIFICATIONS SEE DWG 130.
2. SLIDE OUTLINE MAY NOT BE EXACTLY AS SHOWN.



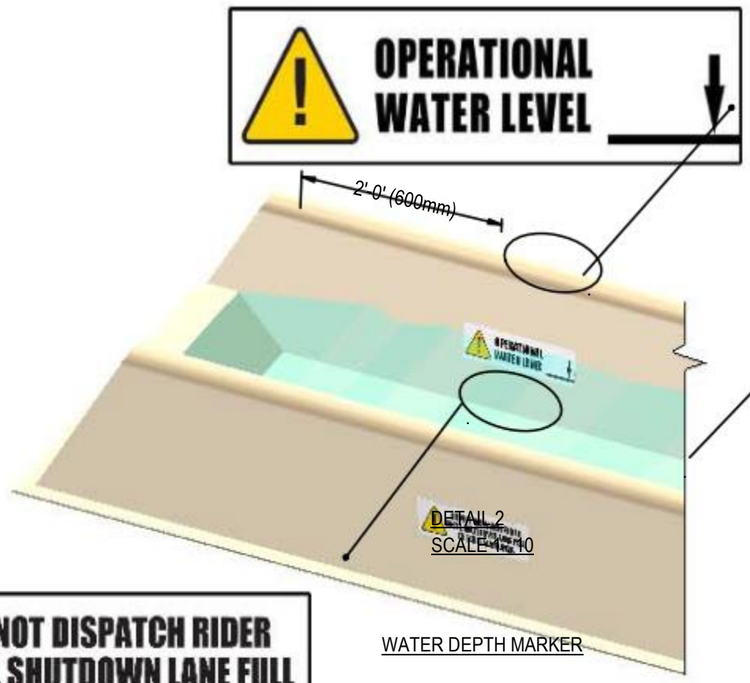



PROVIDE 1"(25mm) THICK
WATERPROOF ADHESIVE TAPE
OF CONTRASTING COLOUR ON
EACH SIDE OF FLOW
TRANSITION LOCATION




DETAIL 3
SCALE 1 : 10

FLOW TRANSITION LOCATION




WATER DEPTH MARKER







| | | | |
|---|---|---|---|
| 0 | ISSUED FOR INFORMATION | | APR 26 2013 |
| DESIGNED BY | DATE | PROJ. ENG. CHECK | DATE |
| N.Kamarzina | APR 26 2013 | - | APR 26 2013 |
| DRAWN BY | DATE | DRAFTING CHECK | DATE |
| N.Kamarzina | APR 26 2013 | - | APR 26 2013 |
| SCALE 1:100 | | ARCHIVE FILE NO. | |

NOTE:- METRIC DIMENSIONS
ALL ELEVATIONS AND CO-ORDINATES ARE IN METERS
ALL OTHER DIMENSIONS ARE IN MILLIMETERS


WHITE WATER
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SHUTDOWN LANE
MARKING PROCEDURE
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| PROJECT No. | DRAWING No. | REV. |
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# PART I
# GENERAL OPERATING GUIDELINES

## Part I GENERAL OPERATING GUIDELINES

### Important Notice

The following operating procedures are presented to waterslide owners as guidelines only. They are not intended to be mandatory or exhaustive. These guidelines do not replace proper consultation with designers, manufacturers and legal counsel, and compliance with local, state (provincial) and federal laws and regulations involving, but not limited to: health, safety and building codes.

### General Operating Considerations

#### 1. Customers

While customers are the key ingredients to the success of any waterpark, certain rules and procedures must be made clear for the park to function efficiently and safely.

#### 1.1 Posted Signs

A sign must be posted at the entrance to the waterpark that states user responsibility and conveys the following rules and regulations:

1 Read and obey all posted signs.
2 Obey all instructions given by the attendants and operators.
3 No glass, cigarettes and/or food are permitted in the water slide area.
4 Anyone under the influence of alcohol or drugs will not be permitted in the park.
5 Pregnant women and those with a history of heart problems or back trouble should not use the slides.
6 Failure to follow rules and instructions can lead to serious injuries.
7 Ride at your own risk.

**Note:** Specific sign requirements for each waterslide are detailed in Part II - Specific Operating Guidelines.

#### 1.2 Access

Provisions must be made to prevent customers from entering the water slide at any points other than at the designated entry access points.

#### 1.3 Physical Condition

Waterslide customers must be checked for proper swimwear and adequate physical condition. Swim attire should not have any metal parts that could damage the slides or cause injuries. Customers who show signs of drug and/or alcohol impairment will not be permitted on the site.

### 1.4 Visitors and Spectators

Visitors and spectators should be physically separated from the areas used by sliders. They should be kept a safe distance away from any wet areas and not be permitted to interfere with the sliders.

### 1.5 Food and Drinks

No food or drinks are allowed in the immediate area of flumes and pools or on decks, stairs and walkways surrounding flumes and pools. Food and beverages should be confined to visitor and spectator areas or similarly marked areas for sliders. Trash containers should be provided to keep litter off decks and walkways and out of flumes and pools.

## *2.* Attendants

Waterpark attendants are responsible for safe and orderly conduct of customers, safe entry and exit of riders from the slides, general crowd control and emergency procedures.

During operating hours, there must be at least one attendant on duty at all times who has completed a Red Cross or equivalent Standard First Aid and Safety course. This person must also be competent in carrying out any emergency procedures specific to the slide he or she is operating.

Every water slide should be equipped with a battery or electronically operated system to provide voice communication between attendants at different locations on the slides and park office or permanently manned control center.

### 2.1 Top of Slides

The area at the top of every water slide must be supervised by at least one attendant who has continuous and direct supervision of that area and is responsible for:

- Ensuring that customers conduct themselves in a safe and orderly manner.
- Ensuring that customers enter slides or rafts/mats properly.
- Ensuring that customers are dispatched at safe intervals.
- Visually surveying all areas of the water slide that are visible from attendant's position, with the exception of the splash pool, and communicating any problems to the other attendants.
- Ensuring that customers meet the minimum and/or maximum restrictions for the slide.
- Ensuring that any vehicles used are in good condition and if inflated, inflated properly.

### 2.2 Splash Pool

The recommended depth for the splash pool is 3.5 feet (1.07 metres) except otherwise noted in special conditions and therefore must be supervised by at least

one certified lifeguard who has continuous and direct supervision of that area and is responsible for:

- Ensuring that customers conduct themselves in a safe and orderly manner.
- Ensuring that customers move into and out of splash pool in a quick and orderly manner.
- Controlling running, horseplay or other unsafe behavior on pool decks.
- Ensuring pool water levels are correct.

### 2.3 Runout Lane

The runout lanes of waterslides must be supervised by at least one attendant who has continuous and direct supervision of that area and is responsible for:

- Ensuring that customers conduct themselves in a safe and orderly manner.
- Ensuring that customers exit runout lane in a quick and orderly manner.
- Controlling running, horseplay or other unsafe behavior on slide apron.
- Ensuring water levels are at level marks and flow transition is within indicator markings.

### 2.4 Water Treatment

A specific person on each shift should be responsible for chlorination and water treatment procedures. They should be thoroughly trained in all aspects including, routine operations, handling, connection, disconnection, emergency procedures and leak control procedures. A safety chart should be posted in or near the chlorination room and a second safety chart should be placed in the pool office near the telephone. Emergency telephone numbers should also be shown on the safety charts.

### 2.5 Pool Operations

A specific person on each shift should be made responsible for all swimming pool operations, such as: circulation and filtering system operation, maintenance, inspections, backwashing and cleaning. They should be thoroughly trained by an expert in swimming pool operations.

## 3. Inspections

Permanently bound log books should be kept to record all inspections, operational tests, water quality monitoring, all accidents and unusual occurrences. Log books should be kept for a period of at least six (6) years from the date of the last entry. Log book entries that cover the twelve (12) month period previous to the last entry in the log book should be kept readily available.

### 3.1 Slide Inspections

Daily inspections must be made to check for:

- obstructions in slide paths

- cracks, chips or bubbles in sliding surfaces
- rough patchwork at joints or cracks
- caulking protruding from joined flanges
- leaking seals at joints
- loose risers on turns
- excessive movement of flumes when walked on
- joints opening up
- proper inflation and condition of rafts, tubes and vehicles
- landing or pool bottom padding, if used, is in good condition and properly secured.

### 3.2 Mechanical Inspections

Daily inspections must be completed on each waterslide:

- before water is circulated to ensure no safety hazards exist
- with the water circulating to ensure there is sufficient water flowing in the channel and correct water level is in splash pool or runout lane
- to ensure that all the pumping and filtration equipment is operating correctly
- to ensure that conveyor system is operating properly and poses no hazard

It is the attendant's responsibility to ensure water flow is maintained in accordance with manufacturers' guidelines. Serious hazards may develop when flow is interrupted in a flume.

### 3.3 Chemical Inspections

Proper water chemical balance must be obtained each day before the facility is opened to the public. While the facility is operational, water quality testing should be performed at intervals in accordance with local health authority's guidelines. Inspections should also be made during periods of heavy usage to ensure circulation and filtration systems are handling peak loads. The attendant must keep logs of all water testings performed. A typical form for water quality testing is shown in Appendix 1-I.

The attendant must ensure that customers cannot come in contact with water treatment, re-circulation and filtration equipment. Mechanical and chemical storage rooms must be locked at all times to prevent customer access.

## 4. Accidents

The most common accidents in waterparks are: slips and falls, collisions between one riding customer and another customer, impact with the pool surface, and abrasions from sidewalls. Operators should keep detailed logs of all reported accidents onsite. A typical accident report form is included in Appendix 1-II.

### 4.1 Incident Reporting

The owner or operator shall notify the manufacturer (Whitewater West Industries Ltd.) of any known serious incidents that require immediate hospital admission. Minor injuries that may or may not require treatment shall be reported to the manufacturer if deemed to be related to the equipment design or function.
There may be local jurisdiction and laws requiring notification of incidents. The owner or operator may be required to notify these local jurisdictions in addition to the above.

### 4.2 Floatation Devices

The operator should not infer that rafts, tubes or any other floatation device, with exception of government approved life jackets, offer the user any safety benefit. Where unapproved floatation devices are provided, signs should be posted stating they are for pleasure only and should not be used as a substitute for approved floatation devices.

### 4.3 Slips and Falls

Slips and falls are a constant concern in all areas of the waterpark. All surfaces intended for pedestrian traffic, whether in the water, on walkways, on loading platforms or on stairs should be made and maintained slip-resistant. Proper periodic maintenance of walking surfaces should be carried out to remove the growth of algae and fungi which could inhibit the surfaces intended function. Adequate drainage should be maintained around all areas of the slides.
The entry section to flumes should be given particular attention with respect to slips and falls. The combination of the flowing water and the customer contacting water on a slippery surface for the first time can be confusing and disorienting. The exit area of the splashdown pool will always be wet and flowing with water which requires special attention with respect to slip-resistant surfaces, drainage and number and location of attendants.
To minimize slip and fall type accidents, attendants throughout the waterpark should control running and horseplay.

### 4.4 Bodily Collisions

Bodily collisions occur in flumes and splash pools as a result of riders traveling at different speeds and riders slowing or stopping in the flume. Restricting traffic flow with proper dispatching intervals can minimize these bodily collisions. The top attendant and lower attendant must have a view of much of the slide and a means of communication between them. The entry attendant must be alert and aware that people will travel at different rates due to variations in body weight, body friction, and rider position. Generally, the heavier the person, the faster the rider will travel. Slippery materials like nylon slide much faster than cotton clothing. All other factors being equal, riders in a sitting position will travel slower than a person lying flat on their back. Under no circumstances should customers be permitted to ride flumes in

a standing position. Similarly, running or leaping entry into flumes is not to be permitted.

In addition to slide entry attendants, use of signal lights or electro-mechanical starting gates should be considered for rider entry control.
As bodily collisions in splash pool area cannot be fully controlled even with proper entry rates; splash pool attendants should be well trained, attentive and aggressive, continuously urging and encouraging customers to leave the flume discharge and splash pool area as quickly as possible. They must be alert to the possibility of problems and be prepared to enter the water at any time to assist a customer. In the event of a delay at discharge, following riders should be stopped at the entry. Riders tend to congregate in the pool because they are temporarily confused and disoriented upon impact with the water, to wait for their friends who are coming behind, or to socialize with persons in the splash pool. Collisions also result from multiple rider entry (i.e. trains). This practice is absolutely prohibited even for small children being carried on their parent's legs.
If marker buoys or lane ropes are used in the splash pool, they must be arranged so they do not become obstacles for riders. Such devices, if used, should float and be simple in design to avoid the possibility of entangling riders.

### 4.5 Chemical Hazards

Personnel must be fully trained in the use of water chemicals. Potentially fatal accidents could result from the release of gaseous chlorine. Improper chemical control could result in skin and eye irritation from excessive treatment. Bacterial problems could also arise from inadequate treatment.

## 5. Emergency Procedures

Every park must have an emergency plan with specific procedures covering:

- crowd control
- park evacuation
- drowning
- heart attacks
- cuts and burns
- neck and spinal injuries
- power or other utility failures
- fires
- security (fights, robbery, vandalism)
- exposure to chlorine
- environmental conditions (e.g., lightning, windstorms, hail, earthquakes)

An emergency plan should address those factors which affect, human safety, protection and correction of equipment, and customer relations. All employees should be trained and drilled periodically in the execution of the emergency plan. The emergency plan

should be easily accessible and be located with first aid equipment and emergency telephone numbers.

Each facility should have a list of current emergency numbers posted by a telephone. The list should include the contact information for the nearest available doctor, ambulance service, hospital, rescue service, police department, fire department and poison control center. A typical emergency telephone list is shown in Appendix 1-III.

Each facility should have available the following first aid supplies:

- A standard 24-unit first aid kit stocked and readily accessible for use.
- A stretcher and blankets.
- A standard plywood backboard or other acceptable splint for persons with back and neck injuries.
- An area or room set aside for the emergency care of injuries.

### 6. Operator's Changes

WhiteWater should be advised of any changes made in slides, structures or equipment, manufactured, designed or installed by WhiteWater West Industries Ltd. Changes could affect the safety of the attraction.

# PART II
# SPECIFIC OPERATING GUIDELINES

## Part II SPECIFIC OPERATING GUIDELINES

### AQUADROP SLIDE waterslides (32) into shutdown lane – Slide AE

The primary operating concern in the AquaDrop is to ensure the riders assume the correct riding position. In addition to written instructions below we recommend a pictorial representation of rider position on walkways leading to the slide, and at the top platform.

**1. Posted Signs**

**1.1 Entry Station:**

Signs should be posted at the entry station of the ride to convey the following rules and regulations:

1. Maximum operational load 1 person, 45-300 lb. (20.4-136.4 kg).
2. Persons under 48 inches (1.22 m) tall or persons greater than 76 inches (1.93 m) are not permitted on this ride.
3. Eyeglasses must be securely affixed to riders with head straps.
4. Swimwear with exposed zippers; buckles, rivets or metal ornamentation are not permitted.
5. Only one rider to enter the flume at a time. Single Riders only!
6. Never form chains.
7. Slide must be ridden feet first lying on your back with legs firmly crossed at the ankles and arms folded across the chest. Riding this slide improperly may cause injury.
8. Do not uncross your legs or attempt to sit up until you come to a stop in the shutdown lane.
9. Do not run, dive, stand, kneel, rotate or stop in the slide.
10. At the end of the slide, obey all instructions by shutdown lane attendant and exit quickly.
11. CAUTION: For safety reasons, pregnant women and persons with heart conditions or back trouble should not ride this slide.

**1.2 Shutdown lane:**

Signs should be posted at the shutdown lane of the ride to convey the following rules and regulations:

1. Do not block the end of the slide.
2. Leave the shutdown lane quickly and orderly.
3. No swimming or flotation devices allowed in the shutdown lane.

## 2. Attendants

Attendants should be alert to controlling crowd behavior, ensuring safe and orderly entry and exit and controlling the proper entry rate into the slide.

FURTHER INSTRUCTIONS FOR THE LAUNCH MECHANISM AND AQUADROP RIDE ARE CONTAINED IN OTHER SECTIONS OF THIS MANUAL. OPERATORS MUST BE TRAINED AND FAMILIAR WITH THESE SECTIONS.

### 2.1 Attendant / top - 1 attendant per slide

Duties:

1. Ensure the crowd behaves in a safe and orderly manner.
2. Ensure all riders meet requirements.
3. Ensure eyeglasses are securely affixed to the riders.
4. Observe bathing suits for zippers, buckles, rivets, etc. and do not allow them on the slide.
5. Observe riders for any physical impairment that compromise safety and do not allow them on the slide.
6. Ensure all riders are in proper riding position before dispatching.
7. The attendant shall dispatch riders one at a time and shall not dispatch a rider until the slide landing area is clear of obstruction and any previous riders, and signal from attendant at shutdown lane that it is OK to dispatch.
8. Monitor riders in areas visible from assigned positions.

### 2.2 Attendant / shutdown lane: 1 lifeguard per two slides

Duties:

1. Ensure customers conduct themselves in a safe and orderly fashion.
2. Do not allow riders to block the end of a slide. Delay dispatch of next rider if the slide landing area is obstructed.
3. Ensure that all riders exit the shutdown lane immediately upon splashdown. Do not permit guests to sit on or congregate around shutdown lane.
4. Be prepared to enter shutdown lane to assist customer out of lane.
5. Do not allow any swimming or flotation devices in shutdown lane.
6. Monitor water level and characteristics of the shutdown lanes. Shutdown lanes require extra attention to make sure water levels are at correct operating levels and flow transition has stabilized. Too little or too much depth in the shutdown lane will affect braking distance and characteristics.
7. Signal the dispatch attendant as to when it is okay to dispatch another rider when:
    i. **flume and shutdown lane are clear of previous riders and,**

i. **water level has recovered to marked level and,**
ii. **flow transition is stable between markings!**

### 3. Vehicles

No vehicles are used in this slide. Patrons ride the slide in bathing suit attire according to instructions above.

### 4. Water Flow

Refer to attached mechanical drawing for design water flows. Specific operational water flow values are determined at the time of commissioning by a WhiteWater representative. Any variations from flows after certification must be approved in writing by WhiteWater.

# PART III
# MAINTENANCE GUIDELINES

## Part III MAINTENANCE GUIDELINES FOR FRP FLUME

If properly maintained, your waterslide will give you years of service and keep sliding the way it was meant to - SAFE and FUN. By keeping the slide and its components properly maintained, you will be ensuring high performance and long life.

### 1. Cleaning

Maintenance requires removal of surface dirt, grease and suntan oil by cleaning the flumes with a soft-bristled brush and mild detergent such as 3M - “Multi Purpose Boat Soap”. For hard water buildup (a white chalky discoloration) removal/maintenance use “C.L.R.” or other cleaners specific for this purpose. For removal of difficult stains use a cut polish or rubbing compound and finish wax or a combination product such as 3M “Marine One-Step Fiberglass Restorer and Wax”.

### 2. Waxing

At least twice each year, the fiberglass finish should be waxed and buffed with high quality paste wax or polish such as 3M “Marine One-Step Fiberglass Restorer and Wax”. On scratched, dull or faded areas use a fine buffing compound to restore the original gloss before waxing. Prolonged exposure to the ultra-violet rays of the sun can in time, cause discoloring and fading. We recommend using paste waxes or polishes containing ultra-violet screens. The more often the surface is waxed, the longer it will last.

**CAUTION**: If you use power tools for buffing or polishing, use extreme care to prevent overheating the surface. Overheating a rubbing compound burns small gritty particles into the slide surface causing blistering and streaking. This may require the area to be sanded and repainted.

### 3. Joints

Slide joints play an important role in rider comfort and pleasure. Proper maintenance will keep the joints smooth and trouble free for years.

#### 3.1 Joint Caulking

All fiberglass sections will expand and contract with temperature changes. Therefore, joints between sections are filled with a flexible, elastic caulking. Should the joints need re-caulking, all the old filler should be removed, the fiberglass should be cleaned and joints should be re-filled using a flexible polyurethane sealant. **DO NOT** use plastic filler that will harden. **Under no circumstances should the joints be fiberglassed over.** Excess joint caulking should be removed from the slide surface by scraping it off with a putty knife. Any remaining traces should be wiped off with lacquer thinner applied to a rag. Do not pour lacquer thinner directly onto a flume joint as it can dissolve the sealant.

### 3.2 Joint Roughness

Joints may become rough with use, especially if metal articles are allowed down the slide. For minor chips and cracks, the joints may be fixed using the procedures outlined in Part III, Section 4.
More serious cases may require power sanding that will cut through the gelcoat. This will require a spray application of new gelcoat by a trained person, finished by sanding and polishing and waxing as outlined in Part III.

## 4. Patching

Chips and cracks may appear in fiberglass flumes from normal usage. The following sections outline procedures to repair minor damage to slides. Due to the hazardous nature of materials used and variability of application methods, we recommend that a qualified fiberglass laminator perform the repairs.

### 4.1 Minor Chips and Cracks

In areas that have chips or cracks in the gelcoat only, or have a scratch that is deep enough to penetrate through the gelcoat to the fiberglass but not deep enough to go completely through the laminate, follow the procedures given in Part III, Section 4.4.
**NOTE:** For damage that penetrates completely through or deep into the laminate, we recommend that a qualified fiberglass laminator perform the repairs.

### 4.2 Surface Cracks

Hairline cracks, sometimes called spider webbing, or star cracks may develop in the gelcoat or surface coating of the fiberglass product. This is caused by a combination of weathering, vibrations, and/or impacts. Although unsightly, they do not necessarily affect structural strength. The hairline cracks can be fixed by sanding out the affected area with 100 grit sandpaper and re-coating the surface with gelcoat. Follow the patching instructions in Part III, Section 4.4.3, omitting steps 4 through 6.

### 4.3 Cracks around Flanges

The area around the flanges of flumes contains a thick layer of gelcoat which is very stiff. Stresses from normal use may cause cracks in the gelcoat around the flanges. These are not structural cracks. Flange cracks may be remedied by sanding the affected area with 100 grit sandpaper and re-coating with gelcoat. Follow the patching instructions in Part III, Section 4.4.3, omitting steps 4 through 6.

## 4.4 Repair Procedures

**WARNING:**

Patching kits contain toxic, combustible and corrosive elements. Use only under well ventilated conditions. Do not inhale fumes. Seek medical attention if polyester resins are swallowed or inhaled. Should contact occur with the eye flush with water for 15 minutes and seek medical attention. If person is wearing contact lenses and the lenses did not flush out from the water, have the person try to remove AFTER the flushing procedure. If contents come in contact with skin or clothing, clean the area immediately with acetone.

Before you start, you will need:

1. Sandpaper: 36 - 100 grit; 220 - 320 grit wet and dry; 600 grit wet and dry
2. Sanding block
3. Acetone
4. 2" masking tape
5. Utility knife
6. Putty knife
7. Mixing board
8. Mixing cup
9. Fiberglass resin hardener (catalyst), use a peroxide based catalyst (MEKP)
10. Patching compound
11. Gelcoat paint
12. 2" fine paint brush
13. Automotive cut polish
14. High quality paste wax such as "Turtle" wax

### 4.4.1 Storage Instructions

Store uncatalyzed patching compound and gelcoat in closed metal containers in a cool area below 73° Fahrenheit (23° Celsius) out of direct sunlight. Do not allow to freeze.

Store liquid catalysts in their original containers according to manufacturer's instructions.

### 4.4.2 Mixing Instructions

Mix only small amounts at one time. The mixtures will harden in twenty (20) minutes to 1 hour, depending on the temperature and the amount of catalyst added. The mixture will harden faster at higher temperatures and with increasing amounts of catalyst added. Use caution when adding catalyst, over catalyzing will result in the mixture cracking. Do not pour catalyzed mixtures back into the can. Do not reduce materials with a "conventional" paint or lacquer thinner.

**Patching Compound:** Add one (1) part catalyst to one hundred (100) parts patching compound on the mixing board. Mix well.
**Gelcoat:** Add one (1) part catalyst to one hundred (100) parts gelcoat in the mixing cup. Mix well.

### 4.4.3 Patching Instructions

1 Sand area to be patched with 36 -100 grit sandpaper. Feather sand to moulded surface and remove all rough edges.
2 Wash area clean with acetone and allow to dry.
3 Mask off area to be patched with 2" masking tape.
4 Using a putty knife, spread the patching compound smoothly over the prepared area to the top of the tape.

**NOTE:** Area must be dry and clear of contaminants, such as dirt and sanded particles, etc.

5 Keep the patched area dry and allow 20 minutes to 1 hour to harden.
6 After the patch has hardened, sand the patched area flush to the surrounding surface with 100 grit sandpaper.

**NOTE:** Sanding will remove the masking tape. Re-tape the area before painting.

7 Using a 2" fine paint brush, paint the area with gelcoat. Allow twenty (20) minutes to one (1) hour to dry.

**NOTE:** The paintbrush and tools can be cleaned with acetone.

8 After the gelcoat has dried, remove the masking tape. Using a sanding block, wet sand with 220 - 320 grit sandpaper. Repeat with 600 grit sandpaper.
9 Buff painted surface with auto cut polish and wash clean with water.
10 Wax and buff painted surface with a high quality paste wax.

# PART IV
# SUPPLEMENT TO MANUAL FOR ASTM STANDARDS

## PART IV SUPPLEMENT TO MANUAL FOR ASTM STANDARDS

### 1. The ASTM standard F 2376-XX Standard Practice for Classification, Design, Manufacture, Construction, and Operation of Water Slide Systems.

The ASTM standard F 2376 for Water Slide Systems is a standard developed specifically to cover Water Slide systems. The standard references several other standards which together form the basis of a complete standard for the Design, Manufacture, Construction and Operation of Water Slide Systems. Operators are encouraged to become active members of the ASTM F24 group. The fees are nominal and provide access to the relevant standards. Operators should be aware of these standards and the responsibilities outlined within them.

**General Description of Rides**
Waterslides use the flow of water to propel or lubricate the movement of riders down a fixed fiberglass flume section. The riders may ride alone with no vehicle, in groups on specially designed inflatable inner tubes or on a custom made inflatable boat or raft. The riding configuration depends on the specific product and the method of riding.

**Description of Motion**
Waterslide flumes are fixed in position and do not move. Propulsion is from gravity aided by water flow in the flume. Riders with or without vehicles will experience motion and accelerations consistent with the flume path. Movements include right and left turns, vertical curves, and deceleration at the finish. Riders or vehicles shall maintain constant contact with the flume ride surface.

**Operational Restrictions Due to Weather**
**Wind** - Waterslide structures are designed to withstand wind loads specified in the building code in force for the ride locations. WhiteWater recommends suspending operation during sustained winds in excess of 40 mph (64 kph).
**Lightning** - Virtually all waterslides use elevated towers as starting platforms. Operation of rides should be suspended during any storm or weather conditions where lightning may occur.
**Rain** - Rain will have no effect on the operation of the slides, with one exception. All flumes rely on the cushioning and braking action of the specified water flow. Rain water can create a very slippery surface and without the braking action of the larger water flow can create an extremely hazardous condition. Under no circumstances should the slides be operated without the main water supply running at specified capacity.

**Safe water flow**
The water flow rate is important to the safe operation of the ride. Operators shall make sure that the water supply is adequate. Insufficient water volume can result in higher speed. The water tends to restrain and cushion motions and impacts as well as reduce speed.

**Evacuation and Emergency Procedures**
In an emergency situation affecting the slide:

1 Top attendants shall cease dispatch of all riders.
2 If water flow is impeding the remedy of the emergency situation, use E-stop to turn off power to the pump(s).
3 Riders in the slide shall continue down the slide and exit normally if possible.
4 Attendants shall ensure all riders have exited the slide either through the bottom or at egress locations.
5 Patrons may remain queued on tower and stairs if they are not affecting the emergency situation.
6 If necessary to evacuate the tower, patrons shall be guided by top attendant to exit via the stairs from the start tower or egress location.
7 Slide should remain closed until cause of emergency situation is investigated and resolved.
8 In case of serious injuries or problems, operator should notify manufacturer and other regulatory bodies as required by law.

**2. The ASTM standard F 853 - XX Standard Practice for Maintenance Procedures for Amusement Rides and Devices.**

The ASTM Standard F 853 for Amusement Rides and Devices is a broad-based standard covering all the various rides and attractions encountered in the amusement industry. Most of the requirements are directed at complex mechanical devices that are subject to wear. These devices may have critical connectors and linkages that must be inspected regularly to avoid catastrophic failure. Waterslides in general are quite simple. The following is WhiteWater's requirement for inspection of waterslides to conform to ASTM. These are to be used in conjunction with WhiteWater's Operation & Maintenance Manual.

**Operational Tests of Critical Operating Items**
Waterslides use water pumped into the starting area of the ride to operate. The water volume is important to safe operation of the ride. In general, the less water volume pumped, the faster the rider will travel. If during operation, the water supply is restricted or fails, operators shall suspend operations when water volume is below specified operating requirements. A basic operational test should be performed daily in accordance with the Waterslides Operations & Maintenance Manual.

Inspection of the fiberglass and sliding surface must be made daily in accordance with the Waterslides Operations & Maintenance Manual. Small chips or surface imperfections may cause injury to riders.

**Recommended Maintenance/Inspection**

The daily inspection of the slides is detailed in the Waterslides Operations & Maintenance Manual Part I - Section 3 and Part III - Section 1, which covers the operational components of the slide. The only other items that should be inspected are the supporting structures for the slides and start platforms.

Inspection of supporting structures:

- Steel structures that are hot dipped galvanized will require visual inspections on a semiannual basis. Areas around field welds should be carefully checked and touched up with zinc rich paint as necessary. If rust streaking occurs, the source should be identified and attended to. If steel structures are ten years old or greater, a comprehensive professional inspection should be performed.
- Steel structures that are painted without galvanizing should be visually inspected on an annual basis. If steel structures are five years old or greater, a comprehensive professional inspection should be performed.
- Wood structures should be visually inspected annually for integrity, tightness of fasteners and general condition. If wood structures are over five years old, a comprehensive professional inspection should be performed.

Climactic and operation conditions vary greatly and will affect the interval times above. In more corrosive environments such as seaside or some indoor installations, the interval times should be reduced.

Other routine checks completed annually:

- All concrete filled stairs and decks should be visually inspected for worn finishes on the nosing and cracked concrete. The underside of the metal decking should be checked for deterioration.
- All welds should be visually inspected for condition and all bolts should be snug.
- Anchor bolts should be checked for tightness and corrosion. Grout around base plates should be in good condition.
- Inspection and maintenance of fiberglass should be performed as per the WhiteWater Operations & Maintenance Manual Part III.

Comprehensive professional inspections should be performed by a qualified engineering or inspection firm. They perform inspections with methods they deem appropriate to assure accurate review of the structure. These methods may include non-destructive testing using ultrasound or other techniques. Inspection would include condition of metal components, welds, bolts, and any other critical items. The inspecting agency should produce a certificate of inspection and/or a report on condition for review by a qualified engineer.

**Fiberglass Wear Limits**
The fiberglass should be inspected regularly as per the WhiteWater Operations & Maintenance Manual Part I - Section 3 and Part III - Section 1. The riding surface of the flume is subject to wear and weathering. The exterior of the slide is subject to weathering. The fiberglass should be inspected professionally if five years old or older.

**Other Wear Limits**
Rides using boats will experience wear on the boats. If the wear is excessive it may impair the function of the boat and operation of the ride. This is especially true if the ride uses shutdown lanes. The wear should be checked in accordance with the boat manufacturer's recommendations.

**Replacement Fasteners**
All replacement fasteners shall conform to the standards specified in the engineering drawings.

**Electrical / Mechanical Systems Operation and Maintenance**
All electrical motors, pumps, controls etc. shall be inspected and maintained in accordance with their manufacturer's recommendations.
All pump intake grating or screens must be inspected to ensure that no structural flaw is evident.
**Note:** Whenever inspection or maintenance work is being done on electrical/mechanical systems, including pump intake grating, all related equipment must be electrically isolated using recognized equipment lock out procedures.

## Appendix 1-I

TYPICAL DAILY WATER QUALITY LOG

**Location:** _____ **Date:** _____

**Weather:** _____

| WATER TEST | | | | FILTER CHECK | | |
|---|---|---|---|---|---|---|
| ***Time*** | ***Chlorine Count*** | ***pH*** | ***Water Clarity*** | ***Backwash*** | ***Temperature*** | ***Initial*** |
| **10:** | | | | | | |
| **11:** | | | | | | |
| **12:** | | | | | | |
| **13:** | | | | | | |
| **14:** | | | | | | |
| **15:** | | | | | | |
| **16:** | | | | | | |
| **17:** | | | | | | |
| **18:** | | | | | | |
| **19:** | | | | | | |
| **20:** | | | | | | |
| **21:** | | | | | | |
| **22:** | | | | | | |
| **23:** | | | | | | |
| **24:** | | | | | | |

## Appendix 1-II

TYPICAL FIRST AID REPORT

| | | | |
|---|---|---|---|
| **First Name of Victim:** | **Middle Initial:** | **Name of Person Filling Report:** | |
| **Last Name:** | | **Location Address:** | |
| **Mailing Address:** | | **City:** | **State/Province:** |
| **City:** | **State/Province:** | **Zip/Postal Code:** | **Location Phone #:** |
| **Zip/Postal Code:** | **Phone #:** | **Location Name:** | |

| | | | | | |
|---|---|---|---|---|---|
| **Date (MM/DD/YY) and Time of injury** | (month) | (day) | 20 | , at | a.m. / p.m. |
| **Date and Time Injury Reported to First Aid Attendant** | (month) | (day) | 20 | , at | a.m. / p.m. |
| **Location of Accident:** | | | | | |
| **What Happened – Victim Statement:** | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **Name of Witness:** | | | | | |
| **Witness Mailing Address:** | | | | | |
| **City:** | **State/Province:** | **Postal Code:** | | | |
| **What Happened – Witness Statement:** | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **First Aid Attendant Description of Injury:** | | | | | |
| | | | | | |
| | | | | | |
| **Was an Ambulance called (circle) Yes / No** | **Manager on Duty:** | | | | |
| **Manager Statement:** | | | | | |
| | | | | | |
| | | | | | |
| I hereby certify that the above statement is true to the best of my knowledge. | | | | | |
| | | | | | |
| **Victim Signature** | **Witness Signature** | **First Aid Attendant Signature** | **Manager on Duty Signature** | | |

## Appendix 1-III

EMERGENCY PHONE NUMBERS

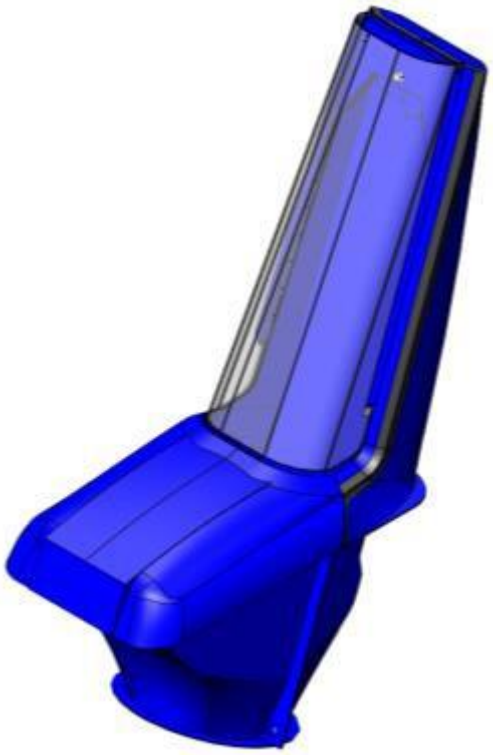
| | | | |
|---|---|---|---|
| **Location Name:** | | **Location Phone:** | |
| **Location Address:** | | | |

**DIAL 911 for Police, or Medical Emergency (if available in your area)**

| **EMERGENCY SERVICES** | | | |
|---|---|---|---|
| **Police:** | | **Sheriff:** | |
| **Hwy Patrol:** | | **Ambulance:** | |
| **PLUMBER** | | **VENDING MACHINE COMPANY** | |
| **Company Name:** | | **Company Name:** | |
| **Contact Name and Phone:** | | **Contact Name and Phone:** | |
| **Secondary Contact Name and Phone:** | | **Secondary Contact Name and Phone:** | |
| **GENERAL CONTRACTOR** | | **WATERSLIDE MANUFACTURER** | |
| **Company Name:** | | **Company Name:** | **WhiteWater West Industries Ltd.** |
| **Contact Name and Phone:** | | **Contact Name and Phone:** | 604-273-1068 |
| **Secondary Contact Name and Phone:** | | **Secondary Contact Name and Phone:** | |
| **ELECTRICIAN** | | | |
| **Company Name:** | | **Company Name:** | |
| **Contact Name and Phone:** | | **Contact Name and Phone:** | |
| **Secondary Contact Name and Phone:** | | **Secondary Contact Name and Phone:** | |
| **SWIMMING POOL SUPPLY** | | | |
| **Company Name:** | | **Company Name:** | |
| **Contact Name and Phone:** | | **Contact Name and Phone:** | |
| **Secondary Contact Name and Phone:** | | **Secondary Contact Name and Phone:** | |

# AquaDrop Generation 2

## Operations Manual



Revision 6

November 1, 2016

www.whitewaterwest.com
6700 McMillan Way
Richmond, BC Canada V6W
1J7

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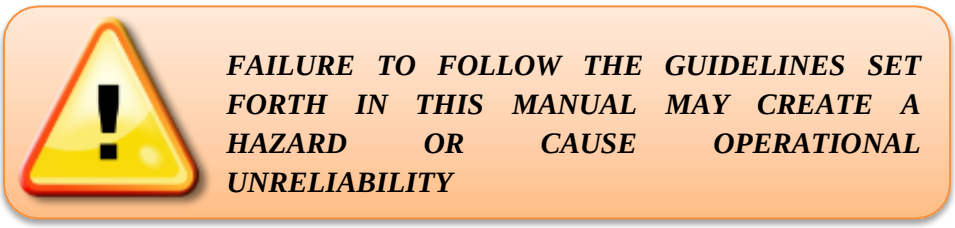
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## 1. Introduction

Congratulations on your purchase of the AquaDrop waterslide from WhiteWater West Industries Ltd. The AquaDrop is an advanced slide involving electro-mechanical control and requires special attention. Please read both the Operations Manual and Maintenance Manual carefully before operating your new slide. These manuals include critical information to help keep your AquaDrop slide operating safely and reliably.

The AquaDrop slide from Whitewater West Industries Ltd. incorporates an extremely reliable safety control system. It is important to bear in mind that this safety control system does not replace the need for vigilant and skilled operation. Ultimate responsibility for safety lies with the operator.




This manual contains basic instructions to safely operate the AquaDrop slide and may also be used for training purposes.

To ensure that this slide is maintained and operated safely, only trained operators are permitted to operate the AquaDrop slide. Operators must understand the sequence of operations and must monitor each slide. Operators must make sure that the rider meets the requirements for the slide, and that he/she is in correct riding position.

By pressing the launch buttons and dispatching a rider, the operator confirms that they have checked the slide, that it is safe, and there is no previous rider in the slide or in the shutdown lane/bowl.

Following the Operations and Maintenance manuals will ensure the safest operation of this slide.

## 2. Slide Overview

This section describes the various components of the AquaDrop slide.

*Note that your slide flume may be different than what's shown below.*

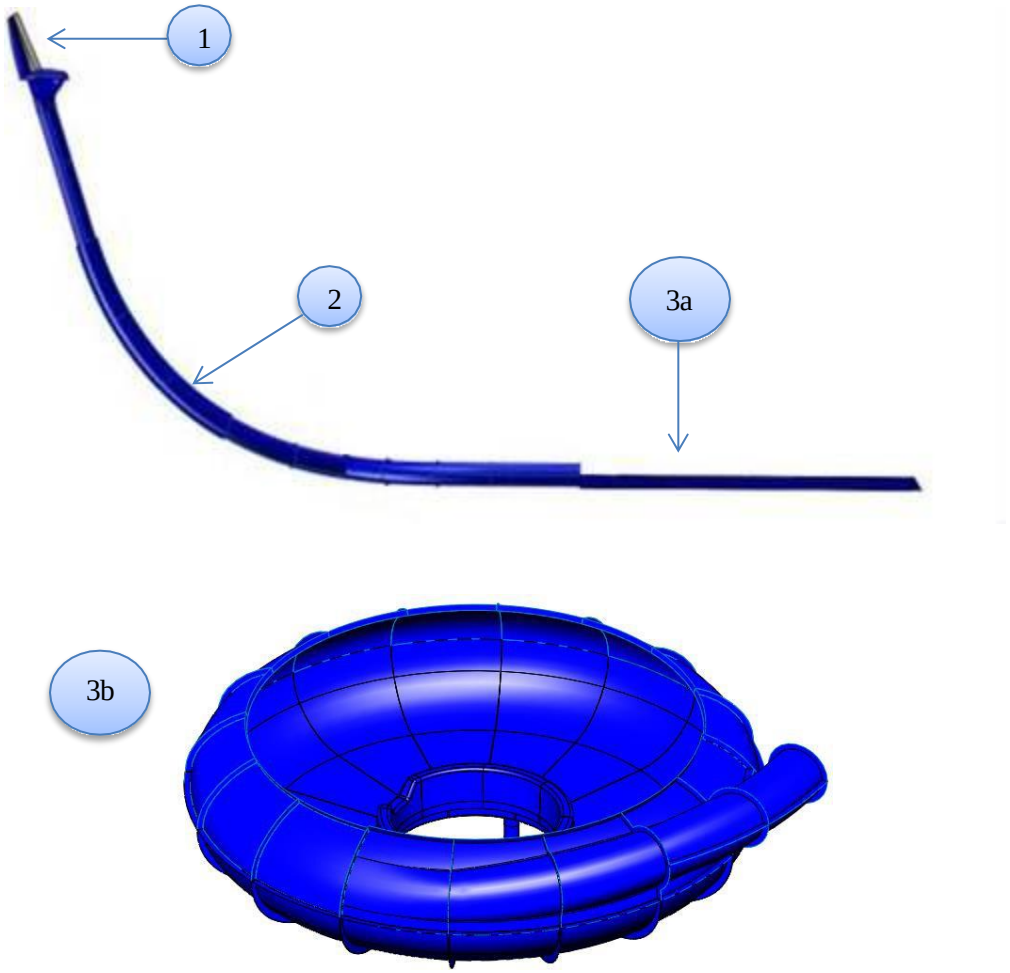



**Figure 1: AquaDrop Overview**

| Item | Name | Function |
|---|---|---|
| **1** | Entry Capsule | Dispatches riders into the slide |
| **2** | Slide Flume | Path which rider travels |
| **3a** | Shutdown Lane | Area where rider comes to rest and safely exit the slide |
| **3b** | Shutdown Bowl | Area where rider comes to rest and safely exit the slide |

## 2.1. Entry Capsule

The Entry Capsule is used to load the rider into the slide and launch him/her in a safe and controlled manner.

It is recommended to place a foot wash tub or station immediately prior to the slide entry to prevent dirt and sand from entering the slide. Ensure that the wash tub does not present a slip, fall or trip hazard.

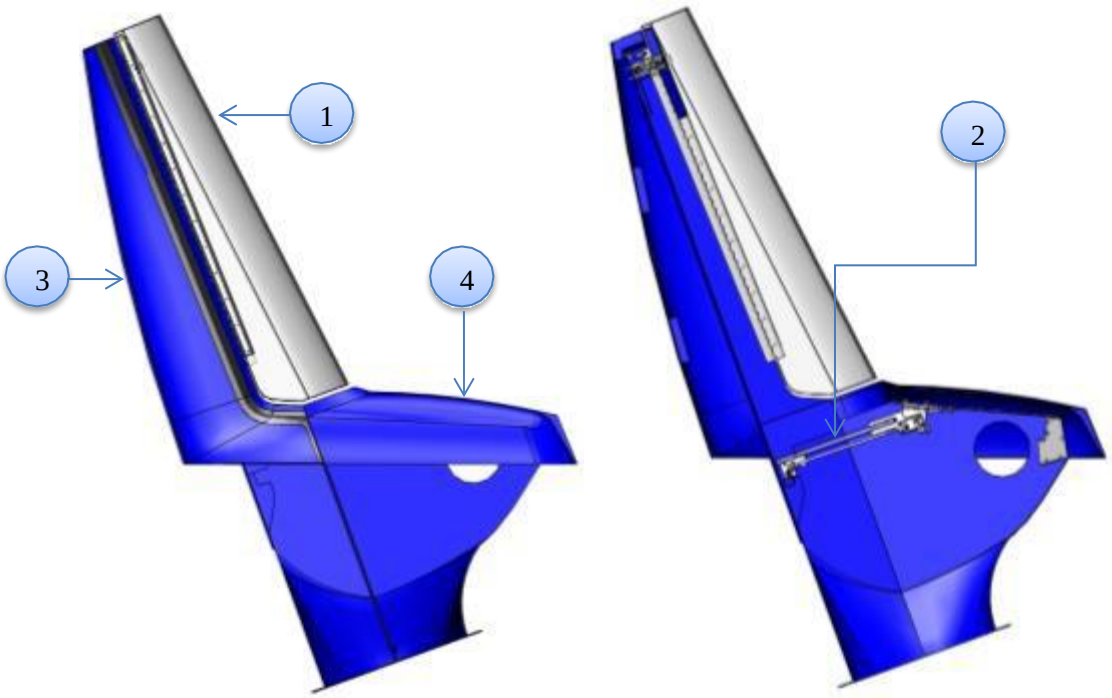



**Figure 2: Side View of Entry Capsule (left) and Section View of Entry Capsule (right)**

| Item | Name | Function |
|---|---|---|
| 1 | Entry Door | Permits access to the Entry Capsule. |
| 2 | Trapdoor | Floor that rider stands on prior to dispatch. |
| 3 | Back Panel | Removable panel for maintenance access. |
| 4 | Front Shroud | Removable shroud for maintenance access. |

### 2.1.1. Ride Control Console ("RCC1" Panel)

The Ride Control Console ("RCC1" panel) is the primary operational console for the AquaDrop. The "RCC1" panel is located adjacent to the Entry Capsule and houses many of the control elements for the slide.




Figure 3: "RCC1" Panel

| Item | Name | Function |
|---|---|---|
| 1 | Operations Key | • Used by operator to turn the slide on and off. |
| 2 | "LAUNCH 1" / "DOOR OPEN" Pushbutton | • Solid green light means rider can be launched. "LAUNCH 1" and "LAUNCH 2" pushbuttons pressed and held simultaneously for three seconds will launch a rider.<br>• Press and hold "LAUNCH 1" pushbutton to open door. |
| 3 | "LAUNCH 2" / "DOOR CLOSE" Pushbutton | • Solid green light means rider can be launched. "LAUNCH 1" and "LAUNCH 2" pushbuttons pressed and held simultaneously for three seconds will launch a rider.<br>• Press and hold "LAUNCH 2" pushbutton to close door. |
| 4 | "ALARM" Lamp / "CLEAR" Pushbutton | • Solid amber light indicates that the slide is occupied.<br>• Flashing amber light indicates an alarm or fault.<br>• Press the "CLEAR" pushbutton at "RCC1" panel after a rider has been launched into the slide to reset the trapdoor. |
| 5 | "EMERGENCY STOP" | • Press the pushbutton in an emergency situation to stop the slide. |
| 6 | PLC Code Window | • Viewing window to read PLC display. |
| 7 | Error Code Legend | • Display list of error codes |

### 2.1.2. Multi-Launch Console ("OPM" Panel)

The multi-launch console is an additional ride control console that can be used to launch multiple AquaDrop slides simultaneously.

The multi-launch console is not a standard component and your slide may not have one installed.

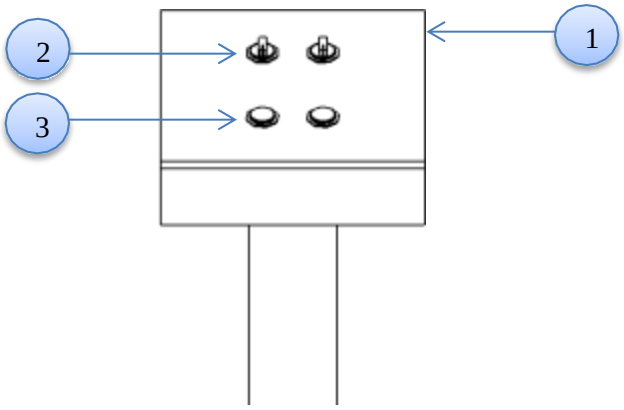



Figure 4: Multi-Launch Console, "OPM" Panel

| Item | Name | Function |
|---|---|---|
| 1 | Multi-Launch Console | Console to operate multiple AquaDrop slides simultaneously. |
| 2 | Override Switch | Rotary switch for overriding the corresponding ride control console ("RCC1" panel). |
| 3 | Launch Buttons | Two pushbuttons used to launch multiple Entry Capsules simultaneously. |

## 2.2. Slide Flume

The slide flume is the length of joined fiberglass sections that the rider slides upon. Proper inspection and maintenance procedures must be followed to maintain the surface of the slide flume.

***THE FIBERGLASS JOINTS ON THE RIDING SURFACE MUST BE THOROUGHLY CHECKED WEEKLY TO ENSURE A SMOOTH TRANSITION THAT IS ALSO FREE OF EXCESS CAULKING!***

## 2.3. Shutdown Lane

The shutdown lane is the area in which riders come to rest after completing the slide.

Located near the shutdown lane is the “OP_EOS” panel which features an “Emergency Stop” pushbutton and a “CLEAR” pushbutton. The “Emergency Stop” pushbutton is used to disable operation of the slide
in the event of an emergency, and the “CLEAR” pushbutton is used to acknowledge that the shutdown lane area is clear of any riders or other hazards before another launch is permitted.

### 2.3.1. Shutdown Lane Flow Transition

Before another rider can be dispatched, the flow transition associated with the slide must be between the specified markers.

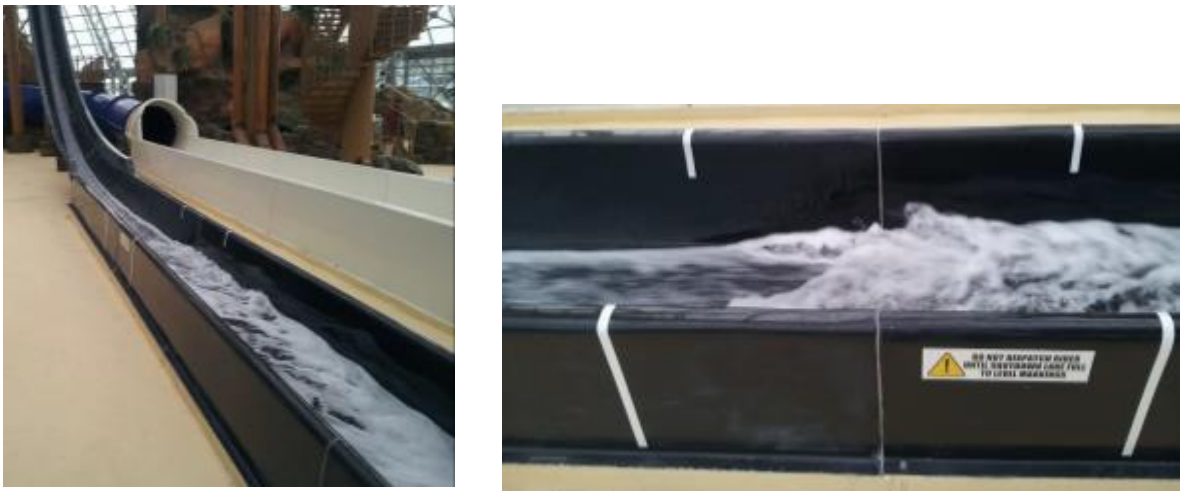


**Figure 5: Flow Transition in Shutdown Lane (left), Flow Transition Markers (right)**

## 2.4. Shutdown Bowl

The shutdown bowl is the area in which riders come to rest after completing the slide.

Located near the exit of the shutdown bowl is the “OP_EOS” panel which features an “Emergency Stop” pushbutton and a “CLEAR” pushbutton. The “Emergency Stop” pushbutton is used to disable operation of the slide in the event of an emergency, and the “CLEAR” pushbutton is used to acknowledge that the shutdown bowl area is clear of any riders or other hazards before another launch is permitted.



Figure 6: Shutdown Bowl

# 3. Operation

This section will illustrate proper operational procedures for the AquaDrop. Following these procedures will ensure a safe and enjoyable experience for the rider and operator.

## 3.1. Operator

The operator should be in good physical and mental condition to operate this slide. Operators must have the following knowledge and qualifications:

- ✓ Training on how to safely operate the AquaDrop.
- ✓ Knowledge of the system's sequence of operation.
- ✓ Lifeguard certification including First Aid training.
- ✓ Experience climbing inside slides; must be able to check and maintain the system.
- ✓ Must be able to perform checks of the Entry Capsule, slide flume and Shutdown lane/bowl.
- ✓ Must follow the safety rules.

## 3.2. Operations Key

The Operations Key is a critical component of the AquaDrop safety system. Although two Operations Keys are supplied with each AquaDrop slide, only one key is required for operation and maintenance of the AquaDrop.

The second Operations Key is only provided as a spare and must only be used in the event that the original Operations Key was lost or damaged. The spare key must be locked away in a secure location and only be accessible by authorized personnel.

The use of both keys as part of daily operations and maintenance procedures is prohibited as it will bypass the safety system and could result in injury to guests or staff.



## 3.3. Rider

Due to the high g-forces and speeds experienced during the ride, riders must be in good physical and mental condition with no medical issues.



***WARNING: THIS IS AN EXTREME RIDE. PERSONS WITH BACK OR NECK PROBLEMS, PREGNANT WOMEN, OR PERSONS WITH HEART CONDITIONS PROHIBITED!***



***PROPER SWIMSUITS MUST BE WORN!***
***(NO JEAN SHORTS, T-SHIRTS OR ADDITIONAL CLOTHING SHALL BE WORN IN THE RIDE)***

Riders must meet the following requirements, and these requirements must be posted on a sign near the Entry Capsule.

- Persons above a weight of 136 kg [300 lb.] are not allowed to ride.
- Persons have to be at least 1.22 m [48 in] tall.
- Pregnant women are not allowed to ride.
- Persons having medical restrictions are not allowed to ride.
- Riders are not allowed to carry any items such as purses, life jackets, mats, glasses, shoes.
- Riders are not allowed to wear any jewelry.

## 3.4. Rider Position

The position of the rider prior to dispatch from the capsule depends on the termination of the slide; either into a shutdown lane or into a shutdown bowl, as described below.

### 3.4.1. Dispatch into Shutdown Lane

To safely dispatch a rider into a shutdown lane, they must be standing upright at the rear of the capsule, with both feet on the trapdoor, looking straight ahead.

They must have their head back, legs firmly crossed at the ankles, and **arms crossed on the chest**, as shown below in Figure 7.

### 3.4.2. Dispatch into Shutdown Bowl

To safely dispatch a rider into a shutdown bowl, they must be standing upright at the rear of the capsule, with both feet on the trapdoor, looking straight ahead.

They must have their head back, legs firmly crossed at the ankles, and **hands clasped together behind head**, as shown below in Figure 8.

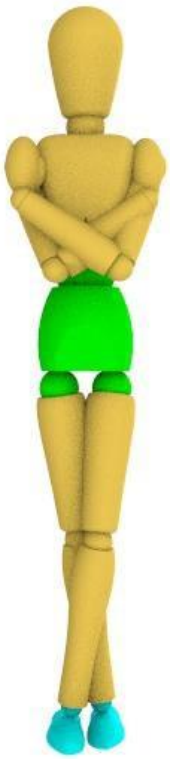


Figure 7: Shutdown Lane Rider Position

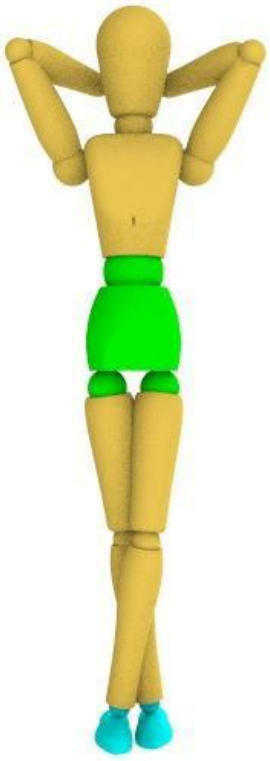


Figure 8: Shutdown Bowl Rider Position

## 3.5. System Start-Up

The purpose of the initial start-up process is to perform safety checks on the various slide components, as well as perform maintenance tasks prior to commencing operation.

While conducting the system start-up, guests must not have access to the slide. The public entrance must remain closed at all times during start-up.

The maintenance inspections must be performed **prior to commencing daily operations**.

Inspection of the Entry Capsule equipment must be performed and recorded in accordance with the Operations and Maintenance manual.

At least two operators are needed to carry out a number of the inspection checks.

### 3.5.1. Daily Slide Surface Inspection

This section will describe the daily slide surface inspection procedure.

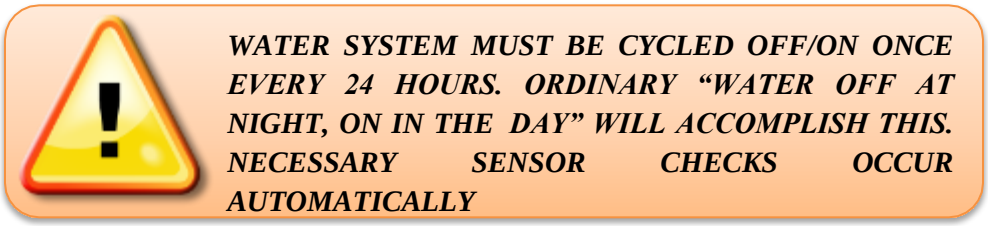



| *Procedure:* | *Daily Slide Surface Inspection* |
|---|---|
| Equipment: | Two people are required |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | *1)* The trapdoor must be hanging down, not fully open or fully closed. *Refer to the Maintenance Manual for instructions on how to release the trapdoor for maintenance.*<br>2) Remove the front shroud and shut off the air supply at the regulator. Observe proper lockout, tag out (LOTO) procedures.<br>3) Ensure the Operations Key is removed from the "RCC1" panel. This ensures the system is off and that no one can operate the slide.<br>4) Lift out and examine the trapdoor assembly. Carefully inspect the trapdoor for chips, cracks, or foreign objects. *Refer to the Maintenance Manual for instructions on how to access the trapdoor for maintenance.*<br>5) Carefully inspect all tubing, wires, valves, and connectors for signs of wear or corrosion.<br>6) Look down into the slide and, to the extent possible, examine the slide surface for hazards.<br>7) Examine the Entry Capsule door for cracks, scratches, corrosion, or damage. |

8) Carefully examine the shutdown lane/bowl for debris, damage, or

unsatisfactory joints.

9) Enter the slide at the end of the shutdown lane/bowl and crawl upstream as far as possible, checking for and removing if necessary:
   a) Calcium/buildup
   b) Protruding caulking
   c) Chips/cracks/bad scratches
   d) Debris
10) Remove and clean all filters, hair strainers, basket filters.




### 3.5.2. Weekly Detailed Inspection and Cleaning

| *Procedure:* | *Weekly Detailed Inspection and Cleaning* |
|---|---|
| Equipment: | Two people are required |
| Materials: | - |
| Frequency: | Weekly |
| Procedure: | 1) Ensure all workplace health and safety regulations are followed at all times. It is your responsibility to know and understand these regulations.<br>2) The trapdoor and the entry door need to be released. *Refer to the Maintenance Manual for instructions on how to release the trapdoor and entry door for maintenance.*<br>3) Secure yourself using appropriate fall protection equipment, as per the health and safety regulations in your area.<br>4) Push open the Entry Capsule Door, and block it open.<br>5) Use appropriate equipment and techniques to abseil/rappel down the slide to the shutdown lane/bowl while:<br>a. Cleaning the slide surface.<br>b. Waxing the ride surface every four weeks is recommended to prevent calcium/mineral buildup, improve water lubricity, and to increase rider comfort.<br>c. Inspecting the joints and slide surface checking for and removing if necessary:<br>i. Calcium/buildups<br>ii. Protruding caulking<br>iii. Chips/cracks/bad scratches<br>iv. Debris<br>d. Cleaning the sprayers (Flatline Loop only). Blow through the sprayer nozzle to ensure it is not blocked.<br>6) Ensure all tools and equipment have been removed from the ride. |



***ONCE PUMPS ARE OPERATIONAL, A VISUAL INSPECTION OF THE RIDE'S WATER SUPPLY MUST BE DONE.***

### 3.5.3. Commencing Daily Operations (Start-up)

In order to commence operations of the AquaDrop, the following procedure must be completed.

| ***Procedure:*** | ***Commencing Daily Operations (Start-up)*** |
|---|---|
| Equipment: | Two people are required |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1) Perform pre-startup daily maintenance and inspections.<br>2) Turn on water supply for:<br>a) Launch<br>b) Shutdown lane/bowl water<br>c) Sprayers<br>3) Verify adequate water flows by:<br>a) Inspecting all flow meters,<br>b) Visually observing water injection points and the shutdown lane/bowl.<br>i) The Launch water is clearly visible through the door of the Entry Capsule.<br>ii) The Shutdown lane/bowl water can be seen by observing the injectors through the transparent trapdoor panel.<br>iii) The sprayers can be observed indirectly though the translucent fiberglass (Flatline Loop only, if applicable)<br>4) Verify the air compressor is active, and supplying at least 95 psi.<br>5) Insert the Operations Key into the "RCC1" panel, and turn it clockwise.<br>6) Look at the two digit code displayed inside the "RCC1" panel. If it is "UE 33", proceed to the next step. If the error code is "UE 11", it has been more than 24 hours since the water supplies have been cycled. All pumps must be turned off and allowed to completely cease movement. Once this is done, return to step 5. *Refer to Maintenance Manual for troubleshooting techniques.*<br>7) Clear the End-of-Slide area:<br>a) Inspect the shutdown lane/bowl and surrounding areas for hazards.<br>b) If no hazards exist, press the "EOS_CL" button on the "OP_EOS" panel to confirm the shutdown area is clear to begin operations.<br>8) Clear the Entry Area:<br>a) Inspect the entry area for hazards. |

b) If no hazards exist, press the button on “RCC1” panel labeled “ALARM LAMP/CLEAR BUTTON” to confirm the entry area is clear to

begin operations.

9) If the trapdoor was open, it will close itself. In this situation, the slide will enter the “occupied” state (fault code “UE 88”). Repeat steps 7 and 8 to clear the occupied status of the slide.
10) Once the slide is ready for operation, the entry door will immediately open. This is the signal that the slide control system is ready for regular operation. The code shown in

## 3.6. Loading Rider

When the operator is ready to load a rider into the Entry Capsule, he or she presses and holds the “DOOR OPEN” pushbutton until the door is all the way open.



***WHILE THE ENTRY DOOR IS OPEN THE TRAPDOOR CANNOT OPERATE AND A RIDER CANNOT BE LAUNCHED!***

If there is a problem while loading, the operator can release the door control pushbutton and the door will stop moving and hold in place. As soon as the operator is ready, he or she can resume operation using the door control pushbuttons.

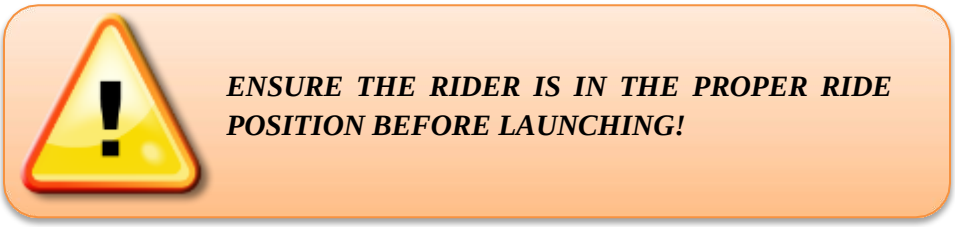
When the operator has completed loading the rider into the Entry Capsule, and the rider is standing in the proper riding position, the operator can close the Entry Capsule door by pressing and holding the “DOOR CLOSE” pushbutton until the door is completely closed.

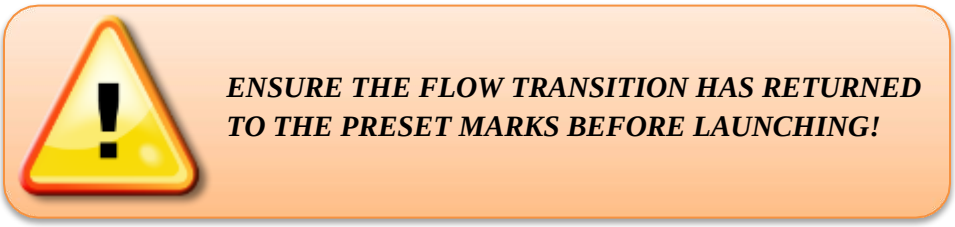
When the door is closed the rider cannot exit the Entry Capsule without the operator opening the door.

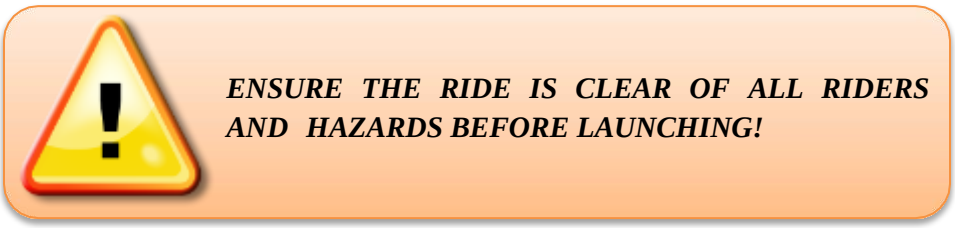
| ***Procedure:*** | ***Loading a Rider*** |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1) Press and hold the button labeled “DOOR OPEN” until the door is fully open.<br>2) Have the guest enter the Entry Capsule, assisting them if necessary.<br>3) Instruct the guest to assume the proper riding position, and visually ensure that they do so.<br>4) Press and hold the button “DOOR CLOSE”, and the door will begin to close. Maintain visual contact with the guest at all times to ensure they are not pinched by the door. |

## 3.7. Launching Rider

The following section outlines the steps to safely launch a rider.







There are two ways to launch the rider; from the “RCC1” panel or from the multi-launch console (if applicable). The following sections will describe both launching procedures.

If the rider is ready, in the correct riding position, and the operator is ready to launch the rider, the operator presses and holds the two launch pushbuttons (same for multi-launch console), thus activating the timer for release of the trapdoor.

Upon pressing and holding the two launch pushbuttons an audible countdown will begin; “three, two, one”.

During the countdown, the operator should continue to observe the rider to ensure the rider maintains the proper launch position.

When the countdown reaches “one”, and the operator still has the two launch pushbuttons pressed, the trapdoor will open, thus launching the rider.

| ***Procedure:*** | ***Launching a Rider from the Ride Control Console (“RCC1” panel)*** |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1) Make sure the override switch on the multi-launch console is in the OFF position. ***NOTE: It is defaulted OFF if there is no multi-launch console installed***.<br>2) Verify that it is safe and appropriate to launch the guest in the manner typical to waterslide operations.<br>3) Simultaneously press and hold both pushbuttons “LAUNCH 1” and “LAUNCH 2” for 3.5 seconds. After 0.5 seconds, the countdown message will play inside the capsule. Maintain visual contact with the guest inside the launch capsule at all times to ensure they maintain an appropriate ride position. Should the guest fail to maintain the appropriate ride position, abort the launch by releasing either or both pushbuttons.<br>4) After the pushbuttons are continuously held for 3.5 seconds, the trapdoor will open, launching the guest into the slide. The pushbutton labeled “ALARM LAMP/CLEAR BUTTON” will illuminate without flashing, indicating the slide is occupied.<br>5) When you are certain the guest has safely left the launch capsule, you may optionally press the pushbutton labeled “ALARM LAMP/CLEAR BUTTON” to immediately close the trapdoor.<br>6) When the trapdoor is safely closed and locked upright, the entry door will immediately open. Pressing either button will interrupt this opening, and then the door can be closed and opened normally.<br>7) Another rider cannot be launched until the operator at the End-of-Slide has pushed the “CLEAR” button to indicate that the previous rider has left the shutdown lane/bowl. |

| ***Procedure:*** | ***Launching a Rider from the Multi-Launch Console (“OPM” Panel)*** |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |

| | |
|---|---|
| Procedure: | 1) Turn the override switches which correspond to the rides you wish to control from the multi-launch console (“OPM” panel) on multi-launch console to the ON position. They will illuminate. The pushbuttons “LAUNCH 1/DOOR OPEN” and “LAUNCH 2/DOOR CLOSE” will begin to flash slowly.<br>2) These two pushbuttons on the multi-launch console (“OPM” panel) now operate identically to the individual buttons on all overridden rides. The pushbuttons on “OPM” panel will open and close all doors, and when held together for 3.5 seconds, launch all riders. |

3) After safely dispatching the guests from the selected launch capsules, you may optionally press either “LAUNCH” pushbutton to immediately reset the trapdoors and begin

****The multi-launch console is an accessory and can be purchased and installed as part of the Entry Capsule package or separately.**

At any time prior to launch the operator can open the entry door, reposition the rider, remove the rider, or load a new rider.

Once the rider has been launched, it is impossible to launch another rider until the slide has been cleared.

Once the slide is cleared, the entry door will open automatically to indicate that another rider can be loaded.

## 3.8. Aborting Launch

Both launch methods have a three second window to abort the launch. To abort the launch within this window, simply release one or both of the “LAUNCH” pushbuttons on either the operator console or multi-launch console. The audible countdown will continue but the rider will not be launched.

To resume a launch once the rider is in the correct position, the operator can press the two launch pushbuttons and the countdown will start again.

## 3.9. Emergency Stop

There are two “EMERGENCY STOP” pushbuttons located throughout the slide; one at the Entry Capsule (“RCC1” panel) and one at the shutdown lane/bowl (“OP_EOS” panel).

Press one of the “EMERGENCY STOP” pushbuttons any time the slide needs to be shut down in an emergency situation. This will disable all operations of the ride.

## 3.10. Power Failure

In the event of a power failure prior to launch, immediately stop operations. The AquaDrop is equipped with a battery backup unit, but it is of limited capacity, and should not be used to conduct regular operations. Unload the guest, close the door, remove the Operations Key from the “RCC1” panel, and wait for the power to return.

In the unlikely event that power is lost and the battery backup fails, a purely mechanical guest removal system is provided. Refer to the Maintenance Manual for instructions on how to manually open the entry door.

## 3.11. Occupied Slide/Clearing the Slide

Once the rider has been launched into the slide, the system will require verification that the rider has completed and safely exited the slide. The amber light on the operator

console will remain lit to indicate that the ride is occupied until the following events have been taken place:

1. The rider is launched from the capsule and the lifeguard at the tower has pressed the “CLEAR” pushbutton at the “RCC1” panel.
2. The lifeguard at the shutdown lane/bowl has pressed the “CLEAR” pushbutton to indicate that the rider has safely exited the slide.

Another rider cannot be launched into the slide until all of these conditions are met.

## 3.12. End-Of-Slide Normal Operations

The operator at the End-Of-Slide/Shutdown area is an active participant in safe ride operation. The following procedure will describe normal end-of-slide operations.

| ***Procedure:*** | ***End-Of-Slide Normal Operations*** |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1) Pay sufficient attention to operations at the slide entry capsule to know when a rider has entered the slide. If you detect a hazard at any time, press the Emergency Stop button.<br>2) In normal operation, the rider will successfully complete the slide, and enter the shutdown lane/bowl.<br>3) When the rider exits the shutdown lane/bowl, and the area is free from hazards, press the “EOS_CL” button on the “OP_EOS” panel. Only after this has been done will another launch be permitted by the control system. |

Once these actions have been completed the trapdoor will reset into the up (closed) position and the Entry Capsule door will open so that another rider can be loaded.

## 3.13. System Faults

If the system detects an error in operation it will go into system fault mode to avoid possible unsafe situations. The amber light on the operator console will flash to warn of a fault.

### 3.13.1. Clearing Faults

In the event that the control system detects a fault, the following procedure must be completed.



***Refer to the Maintenance Manual for detailed instructions on troubleshooting fault codes.***

| ***Procedure:*** | ***Clearing Faults*** |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1) Identify the problem which has caused the fault by referring to the “Error Code Legend” on the front of the “RCC1” panel.<br>2) Fix the problem which faulted the system. If you cannot resolve the problem, contact Maintenance personnel.<br>3) If fixing the problem required that the control system be powered off, restore system power, and complete the procedure described under “Start Up”, otherwise:<br>4) Clear the end of slide area:<br>a. Inspect the shutdown lane/bowl and surrounding areas for hazards.<br>b. If no hazards exist, press the “EOS_CL” button to confirm the shutdown area is clear to begin operations.<br>5) Clear the entry area:<br>a. Inspect the entry area for hazards.<br>b. If no hazards exist, press the button on “RCC1” panel labeled “ALARM LAMP/CLEAR BUTTON” to confirm the entry area is clear to begin operations.<br>6) If the control system detects no further faults, the display within the “RCC1” panel will flash “UE 00”, and operations can commence.<br>7) If the problem persists, contact Maintenance personnel. |

## 3.14. Daily End of Operation (System Shutdown)

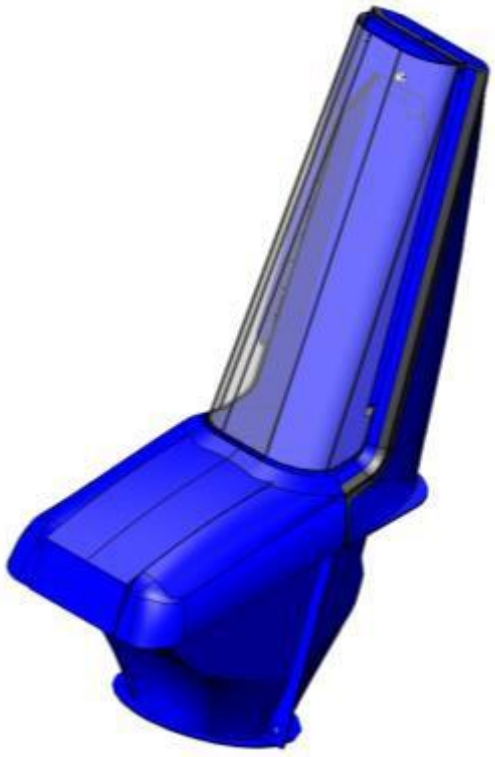
At the end of daily operations, the slide must be shut down safely to ensure no unauthorized use of the slide. To accomplish this, the following procedure must be performed.

| ***Procedure:*** | ***Daily End of Operation (System Shutdown)*** |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1) Fully close the entry door using the pushbutton "DOOR CLOSE". Ensure there are no riders, tools, or other hazards within the Entry Capsule.<br>2) For outdoor slides where strong winds are common, it's recommended to use a strap or other means to secure the door closed overnight. This will help prevent any unnecessary damage to door assembly.<br>3) When the door is fully closed, remove the Operations Key from "RCC1" panel.<br>4) Store the Operations Key in a safe location as determined by park management.<br>5) Turn off all water supplied to the slide.<br>6) It is not recommended to turn off the air compressor, as it takes some time to fully recharge the tank after a shutdown. |



# AquaDrop Generation 2

## Maintenance Manual



Revision 4

October 16, 2015

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6700 McMillan Way
Richmond, BC Canada V6W
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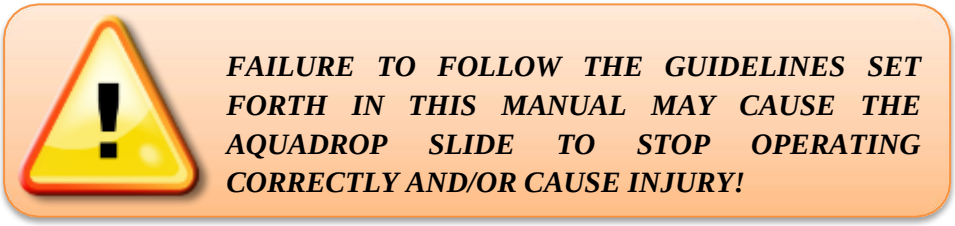
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# 1. Introduction

Congratulations on your purchase of the AquaDrop waterslide from WhiteWater West Industries. The AquaDrop, is an advanced slide involving electro-mechanical control and requires special attention. Please read this maintenance manual carefully before operating your new slide. This manual includes important instructions required to maintain safe operation of the AquaDrop slide.



## 2. Mechanical

There are several mechanical components on the AquaDrop that require maintenance and/or monitoring to ensure the safety of the slide.

Prior to any maintenance, ensure the trapdoor is down (open) and the Operations Key is removed from the “RCC1” panel. All checks should be performed in accordance with this maintenance manual and should be documented for your records.

***ENSURE THAT THE OPERATIONS KEY IS REMOVED BEFORE PERFORMING ANY MAINTENANCE ON THIS SLIDE!***

### 2.1. *Removing Launch Shroud*

The shroud is a protective and aesthetic cover that surrounds the base of the launch. Removal of the shroud is necessary to perform certain maintenance tasks on the trapdoor and other components. This section will describe how to remove the launch shroud.



Figure 1: Shroud Installed



Figure 2: Shroud Removed

| *Maintenance Procedure:* | *Removing Launch Shroud* |
|---|---|
| Equipment: | Two people are required |
| Materials: | - |
| Frequency: | As required |

| | |
|---|---|
| Procedure: | 1. With one person on each side, carefully lift the shroud from the AquaDrop using the handles provided.<br>2. Place the shroud flat on the deck, clear of the immediate workspace.<br>3. Replace the shroud when maintenance is complete. |

## 2.2. *Access Panels*

There are two access panels located at the back of the launch which provide access to certain mechanical, electrical and pneumatic components. Removal of these panels is necessary to perform certain maintenance tasks. This section will describe how to remove these access panels.

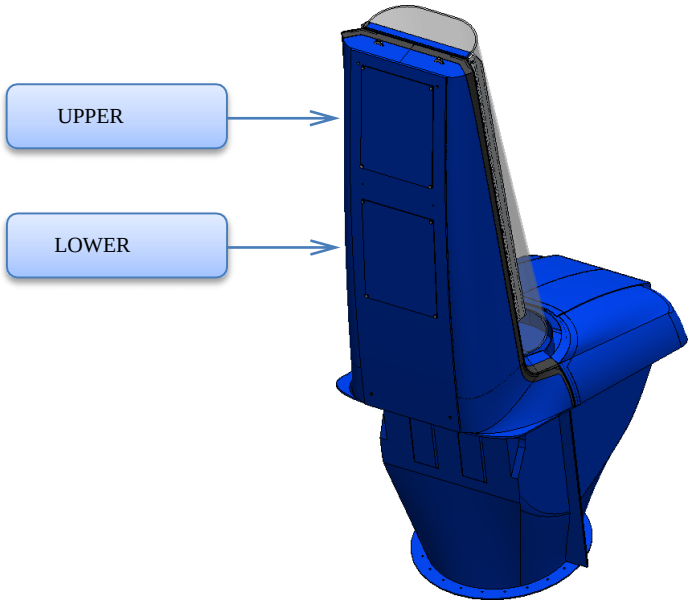



**Figure 3: Access Panels**

| ***Maintenance Procedure:*** | ***Removing Access Panels*** |
|---|---|
| Equipment: | None |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Unscrew the four thumb screws from the panel you wish to remove. *Be careful not to lose the screws.*<br>2. Carefully remove the panel and set it on the ground with the finished side facing up.<br>3. Replace the panel when the maintenance is complete. |

## 2.3. *Trapdoor Assembly*

The trapdoor assembly is a critical component of the slide that **requires regular inspection and maintenance.**

***DO NOT STAND ON THE TRAPDOOR WHILE PERFORMING ANY MAINTENANCE ACTIVITIES!***

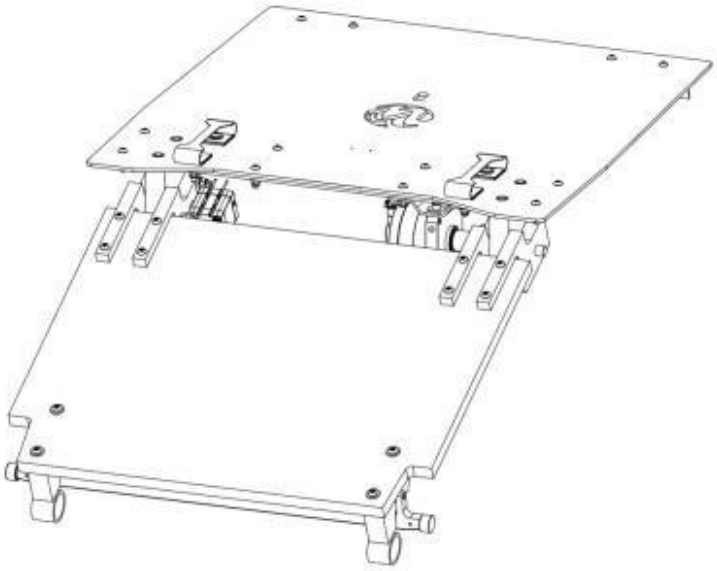


Figure 4: Trapdoor Assembly

### 2.3.1. Releasing the Trapdoor for Maintenance

Certain maintenance activities require that the trapdoor be released and placed in the open position. This section will describe how to release the trapdoor.

| *Maintenance Procedure:* | *Releasing the Trapdoor for Maintenance* |
|---|---|
| Equipment: | Aluminum framing square |
| Materials: | - |
| Frequency: | As required |

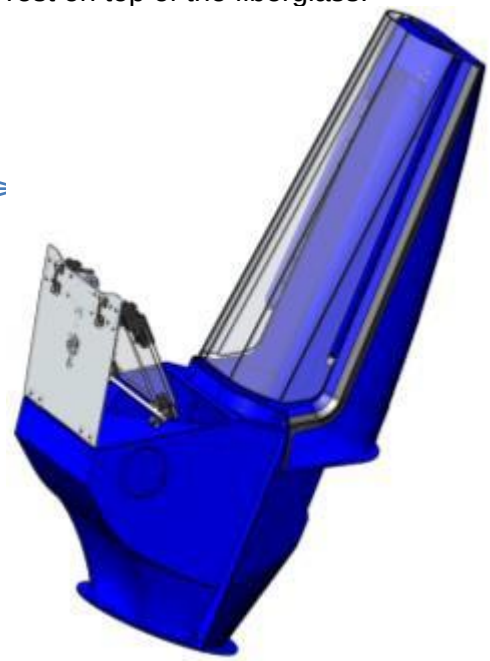
| | |
|---|---|
| Procedure: | 1. Remove Operations key from the “RCC1” panel and turn off the air at the regulator. Refer to Section 3.1.1 for the location of the air regulator.<br>2. Observe proper lockout-tagout (LOTO) procedures.<br>3. Insert a framing square into the gap between the trapdoor and the launch capsule. See Figure 43.<br>4. Use the framing square to lever forward the roller bar and<br>release the trapdoor. |

### 2.3.2. Accessing the Trapdoor for Maintenance

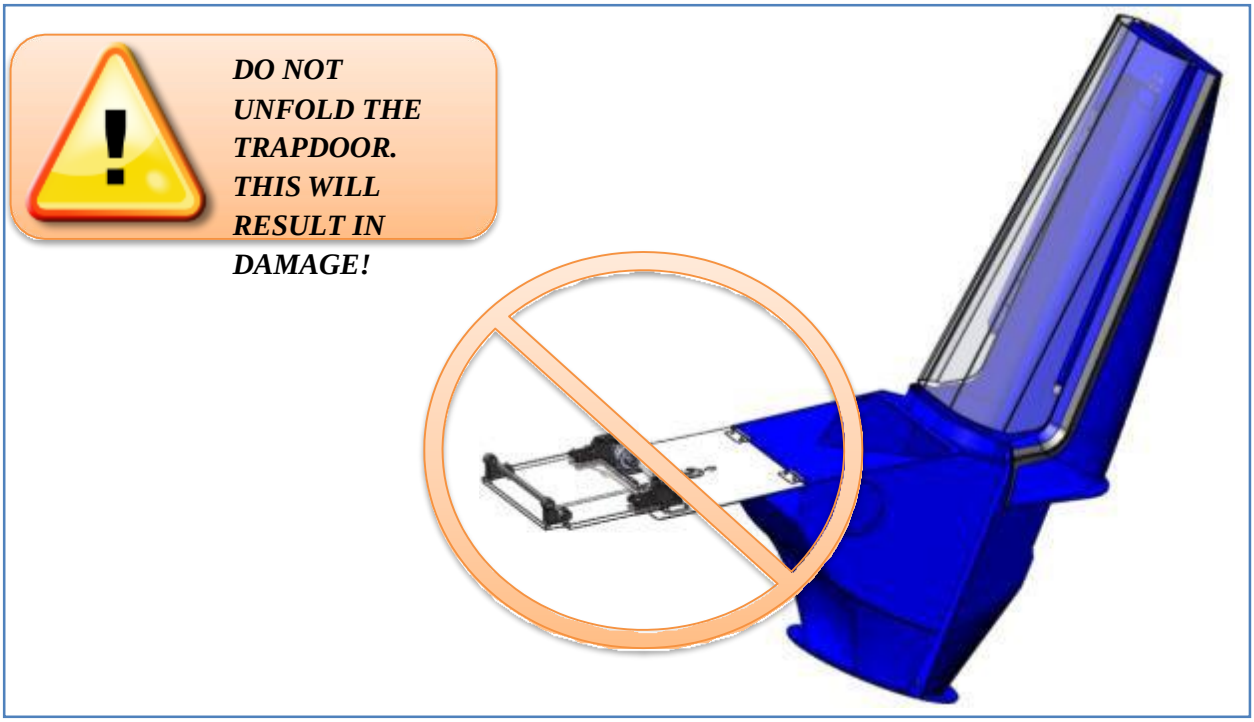
The trapdoor requires periodic inspection and maintenance, and full access to the trapdoor is required to perform these tasks. This section will describe how to access the trapdoor to perform maintenance tasks.

| ***Maintenance Procedure:*** | ***Accessing the Trapdoor for Maintenance*** |
|---|---|
| Equipment: | Two people are required |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove Operations Key from the "RCC1" panel and turn off the air at the regulator. Refer to 3.1.1 for the location of the air regulator.<br>2. Observe proper lockout-tagout (LOTO) procedures.<br>3. Remove the shroud as per Section 2.1<br>4. If the trapdoor is open, proceed to the next step, otherwise release the trapdoor as per Section 2.3.1.<br>5. Release the clamps on both sides of the trapdoor assembly.<br>6. With one person on each side of the trapdoor, slowly pull the trapdoor upwards using the handles. Use your free hand to move the trapdoor so that the rubber bumpers rest on top of the fiberglass. |

TRAPDOOR READY FOR MAINTENANCE



7. **DO NOT** unfold the trapdoor assembly, as shown below. This will result in damage to the trapdoor.




### 2.3.3. Returning the Trapdoor after Maintenance

If the trapdoor has been removed from the slide to perform certain maintenance tasks, it will need to be returned to the slide prior to operating the slide. This section will describe how to return the trapdoor to the slide.

| *Maintenance Procedure:* | *Returning the Trapdoor after Maintenance* |
|---|---|
| Equipment: | Two people are required |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. With one person on each side of the trapdoor, use one hand to grab the handle on the trapdoor plate and use the other hand to support the bottom of the trapdoor.<br>2. Slowly lift the trapdoor plate and guide the bottom of the trapdoor into the opening in the launch.<br>3. Once the trapdoor is fit into the opening, slowly lower the trapdoor until the plate rests on the fiberglass. Watch that your hands and feet are clear of the trapdoor as you lower it and DO NOT slam the trapdoor.<br>4. Engage the clamps on both sides of the trapdoor assembly. |

***DO NOT SLAM THE TRAPDOOR!***

### 2.3.4. Trapdoor Panel Inspection

The trapdoor panel is a critical part of the trapdoor assembly and is what the rider stands on prior to being dropped into the slide. Periodic inspection of the trapdoor is required to ensure safe operation of the slide.

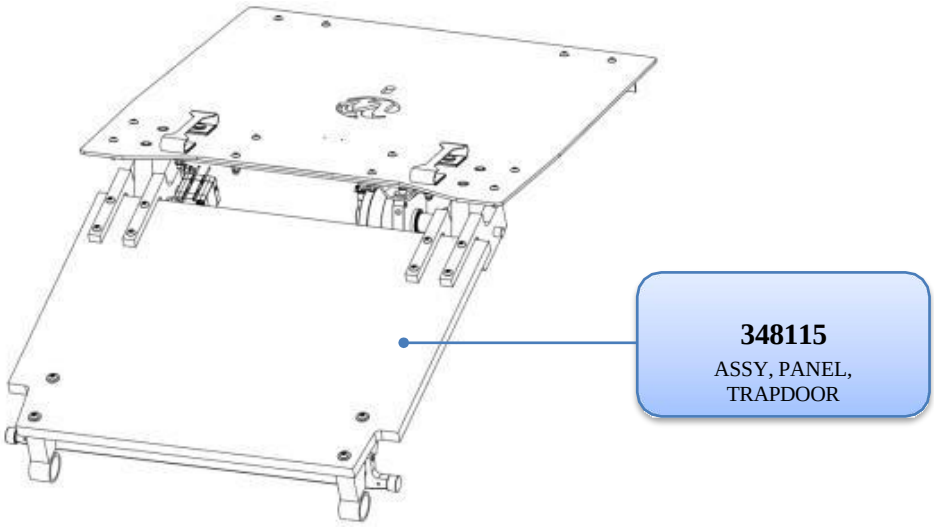



Figure 5: Trapdoor Panel

| *Maintenance Procedure:* | *Trapdoor Inspection* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Prepare the trapdoor for maintenance access as per Section 2.3.2.<br>2. Visually inspect the trapdoor for cracks or any other damage.<br>3. If the trapdoor is damaged in any way, DO NOT operate the slide until repairs are completed by authorized personnel. |

### 2.3.5. Cleaning the Trapdoor Panel

The trapdoor panel requires periodic cleaning to prevent material buildup and to maintain its appearance. This section will describe the cleaning procedure.

| *Maintenance Procedure:* | *Cleaning the Trapdoor Panel* |
|---|---|
| Equipment: | Soft, lint free cloth, solution of mild detergent, chamois |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Prepare the trapdoor for maintenance access as per Section 2.3.2.<br>2. Clean the top and bottom surfaces of the trapdoor panel with a mild solution of soap or detergent and lukewarm water.<br>3. Use a soft cloth or sponge to gently loosen any dirt or debris and rinse well with water.<br>4. A chamois or cellulose sponge may be used to dry the trapdoor. |

### 2.3.6. Roller Bar Inspection

The roller bar is a critical component of the trapdoor mechanism and must be removed annually and subjected to dye penetrant inspection, as per ASTM E1417/E1417M, to inspect the part for cracks. This section will describe how to remove and inspect the roller bar.

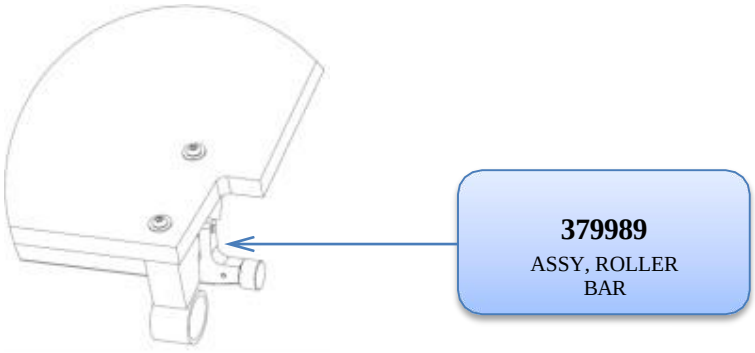
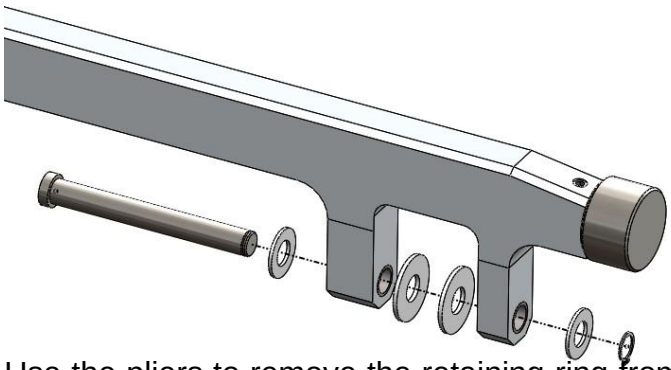


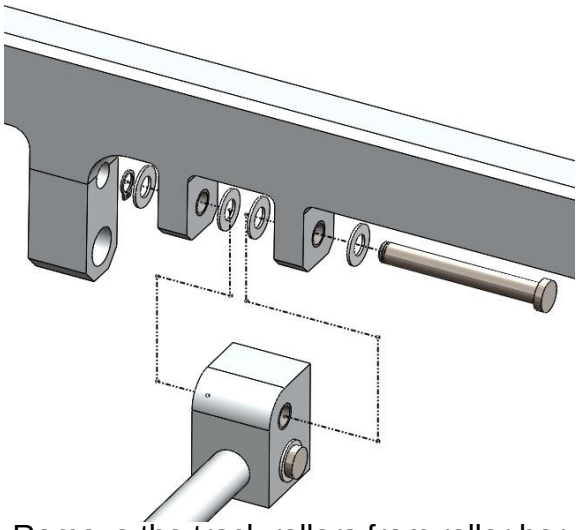

Figure 6: Roller Bar Detail

| *Maintenance Procedure:* | *Roller Bar Inspection* |
|---|---|
| Equipment: | Retaining ring pliers |
| Materials: | - |
| Frequency: | Annually |
| Procedure: | 1. Prepare the trapdoor for maintenance access as per Section 2.3.2.<br>2. Use the pliers to remove the retaining ring from the pin through the roller bar and pillow block. Remove the pin and washers. Repeat on other side. |

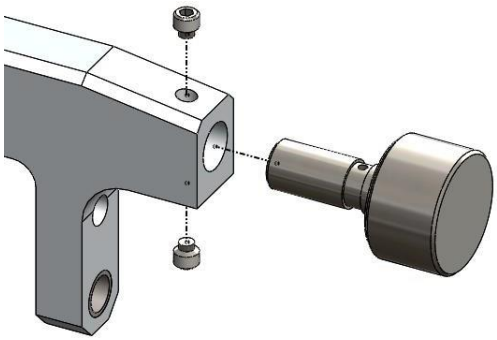




3. Use the pliers to remove the retaining ring from the pin through the roller bar and push rod connector. Remove pin and washers.



4. Remove the track rollers from roller bar assembly.



5. Have the roller bar inspected for cracks as per ASTM E1417/E1417M dye penetrate testing procedures.
6. If the roller bar is found to be free of cracks, reassemble the roller bar and trapdoor assembly.
7. If the roller bar is found to contain cracks, DO NOT OPERATE the slide until repairs are completed by

authorized personnel. *Please retain the damaged roller bar for inspection by WhiteWater personnel.*

### 2.3.7. Rollers

The trapdoor has a set of two rollers which are vital components of the trapdoor release mechanism. The rollers are used to lock the trapdoor in both the open and closed positions.

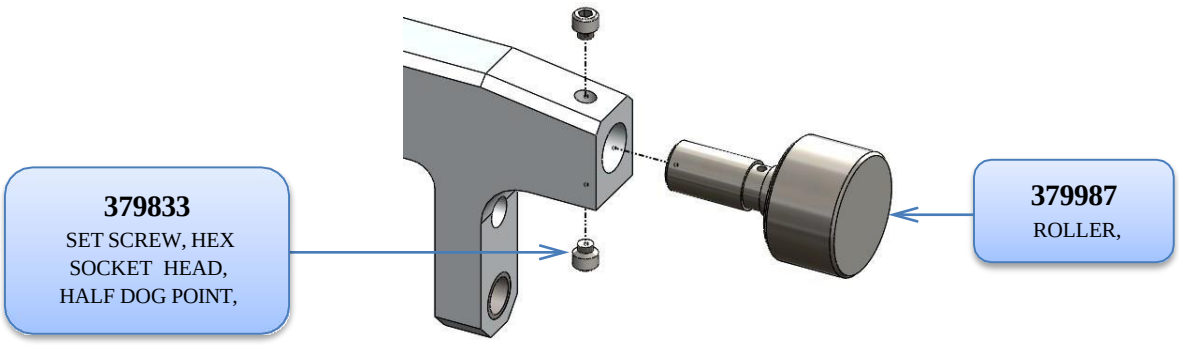



Figure 7: Roller Detail

#### 2.3.7.1. Inspection of Rollers

Daily inspection of the rollers is required to ensure reliable operation of the trapdoor. This section will describe how to inspect the rollers.

| Maintenance Procedure: | Inspection of Rollers |
|---|---|
| Equipment: | Imperial Allen keys |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Visually inspect each roller for debris and corrosion. The inside face of the roller must be flush against the end of the roller bar and no threads should be visible.<br>2. Turn each roller by hand and ensure that they rotate smoothly without binding<br>3. Verify that each set screw is in place and secure (two per side).<br>4. If a roller is loose, damaged, seized or excessively corroded,<br>replace it as per Section 2.3.7.2. |

#### 2.3.7.2. Replacement of Rollers

Due to physical and environmental conditions, the rollers require periodic replacement. This section will describe how to replace the rollers.

| *Maintenance Procedure:* | *Replacement of Rollers* |
|---|---|
| Equipment: | Imperial Allen keys<br>Torque wrench |
| Materials: | 379987-ROLLER, TRACK, QTY = 2<br>379833-SET SCREW, QTY = 4<br>Thread degreaser<br>Loctite 7649 Primer N<br>Loctite 242 (blue) |
| Frequency: | Annually or as required |
| Procedure: | 1. Loosen and remove the set screws which hold the roller in place and discard.<br>2. Unscrew and remove the old roller from the roller bar and discard.<br>3. Degrease the threads of the new track roller and prime with Loctite 7649 Primer N. Apply Loctite 242 (blue) to threads of track roller and torque to 20 N-m (175 in-lb.)<br>4. Replace the set screws with new ones, applying Loctite 242 (blue) to the threads. Torque set screws to 5.5 N-m (50 in-lb.) |

### 2.3.8. Bumpers

Rubber bumpers are used to absorb the impact energy when the trapdoor opens during operation.

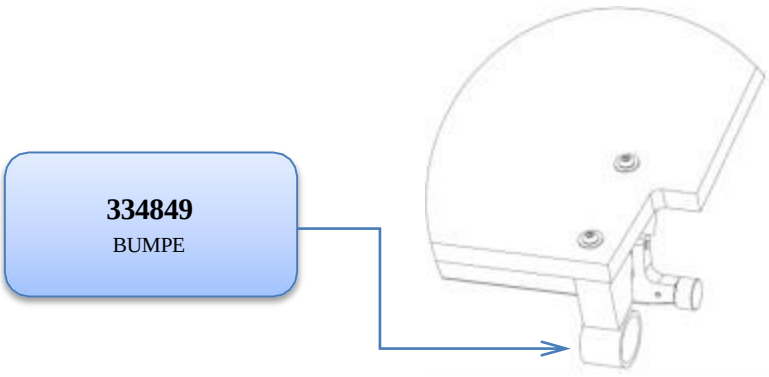



Figure 8: Bumper Detail

#### 2.3.8.1. *Inspection of Bumpers*

Periodic inspection of the bumpers is required to ensure correct operation of the trapdoor. This section will describe how to inspect the bumpers.

| *Maintenance Procedure:* | *Inspection of Bumpers* |
|---|---|

| | |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | Weekly |
| Procedure: | 1. Visually inspect each bumper for cracks and signs of material degradation.<br>2. If the bumper is cracked or has become brittle, replace the bumper as per Section 2.3.8.2. |

#### *2.3.8.2. Replacement of Rubber Bumpers*

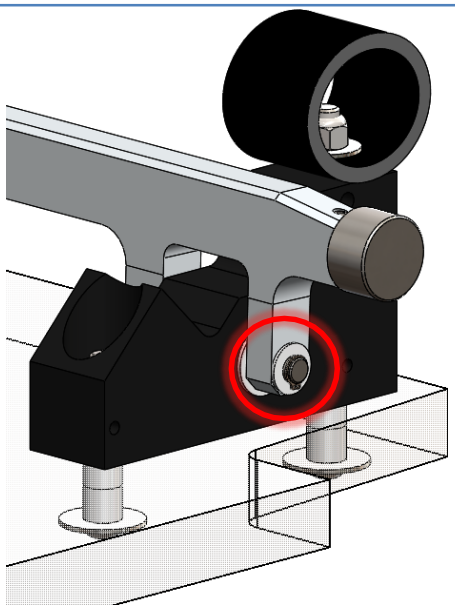
Due to physical and environmental conditions, the bumpers may require replacement. This section will describe how to replace the bumpers.

| *Maintenance Procedure:* | *Replacement of Rubber Bumpers* |
|---|---|
| Equipment: | Imperial Allen keys<br>Imperial wrenches<br>Torque wrench |
| Materials: | 334849-BUMPER, QTY = 2<br>Loctite 242 (blue) |
| Frequency: | As required |
| Procedure: | 1. Remove and discard the locknut which secures the bumper.<br>2. Remove and discard the old bumper.<br>3. Replace the old bumper with a new one and fasten in place using a new locknut. Apply Loctite 242 (blue) to threads.<br>4. Torque the locknut to 14 N-m (10 ft-lb) |

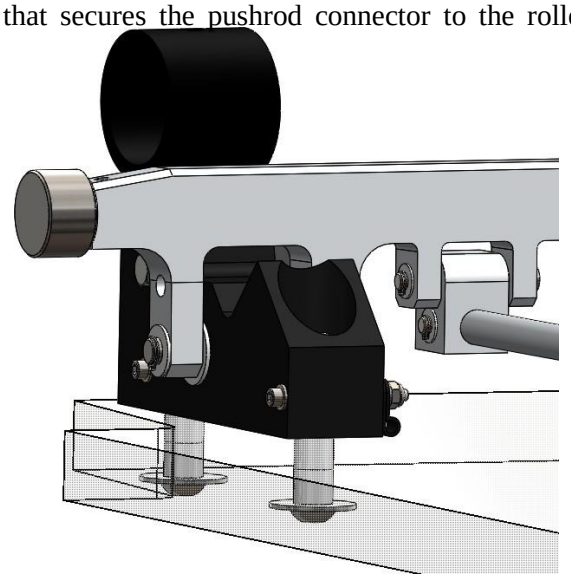
### 2.3.9. Retaining Ring Inspection

The retaining rings in the trapdoor assembly are used to secure several key components. Periodic inspection of the retaining rings is required to ensure safe operation of the trapdoor. This section will describe the inspection procedure for the retaining rings.

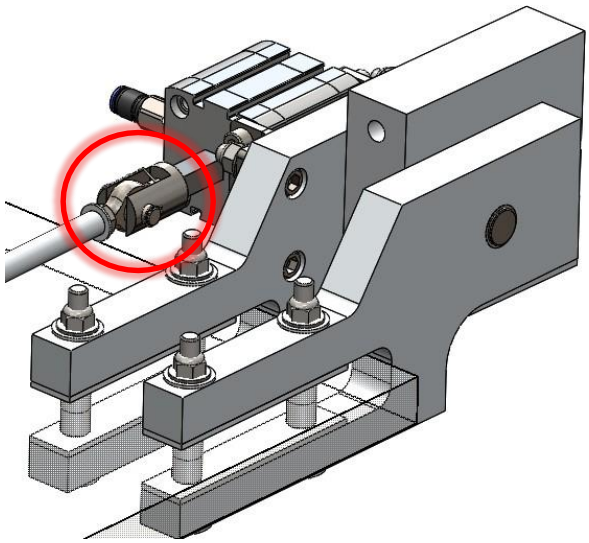
| *Maintenance Procedure:* | Retaining Ring *Inspection* |
|---|---|
| Equipment: | Retaining ring pliers |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Prepare the trapdoor for maintenance access as per Section 2.3.2.<br>2. All retaining rings must be securely seated with the groove of their respective pin.<br>3. Visually inspect the retaining ring that secures one side of the roller bar to one of the pillow blocks. Repeat on the other pillow block. |



4. Visually inspect the retaining ring that secures the pushrod to the pushrod connector, and the retaining ring that secures the pushrod connector to the roller bar.



5. Visually inspect the retaining ring that secures the rod end to the cylinder clevis. Also check the security wire that is fed through the head of the bolt that fastens the clevis to the drop cylinder.



6. If any retaining rings are missing, **DO NOT OPERATE** the slide until they have been replaced.

### 2.3.10. Roller Plate Inspection

The roller plates are used to support the trapdoor in the closed position. Periodic inspection of the roller plates is required to ensure safe and reliable trapdoor operation. This section will describe how to inspect the roller plates.

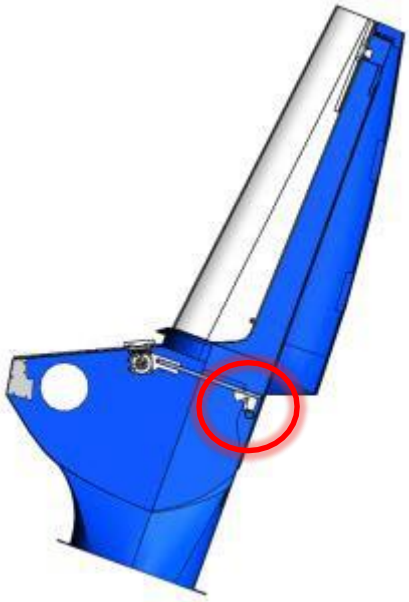


Figure 9: Roller Plate Location

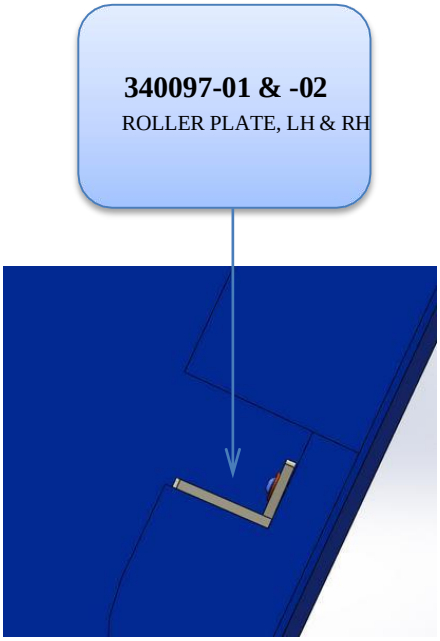



Figure 10: Roller Plate Location Detail

| *Maintenance Procedure:* | *Roller Plate Inspection* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Disengage the entry door as per Section 2.4.3.<br>4. Wearing appropriate fall protection gear, open the entry door and inspect the roller plates for wear, debris, or corrosion.<br>5. Replace the roller plates as required. |

### 2.3.11. Trap Inspection

The traps are used to lock the trapdoor in the open position after a rider has been launched. Periodic inspection of the traps is required to ensure safe and reliable trapdoor operation. This section will describe how to inspect the traps.

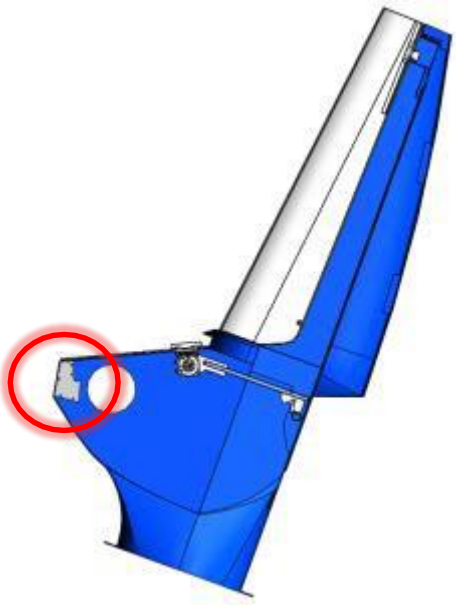


Figure 11: Trap Location

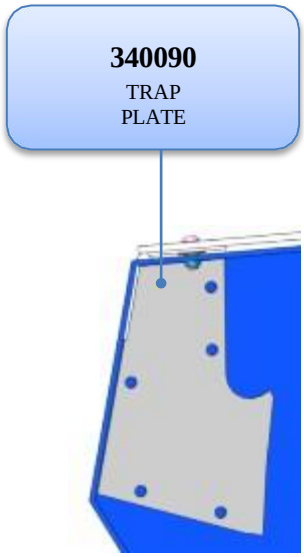



Figure 12: Trap Location Detail

| *Maintenance Procedure:* | *Trap Inspection* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Look through the holes on the side of the launch and inspect the traps for signs of wear or degradation.<br>3. Replace the traps as required. |

### 2.3.12. Hinge Inspection

The hinges allow the trapdoor assembly to be manipulated for maintenance access. Periodic inspection of the hinges is required. This section will describe how to inspect the hinges. *Note that the location and type of hinge(s) may vary depending on your installation.*

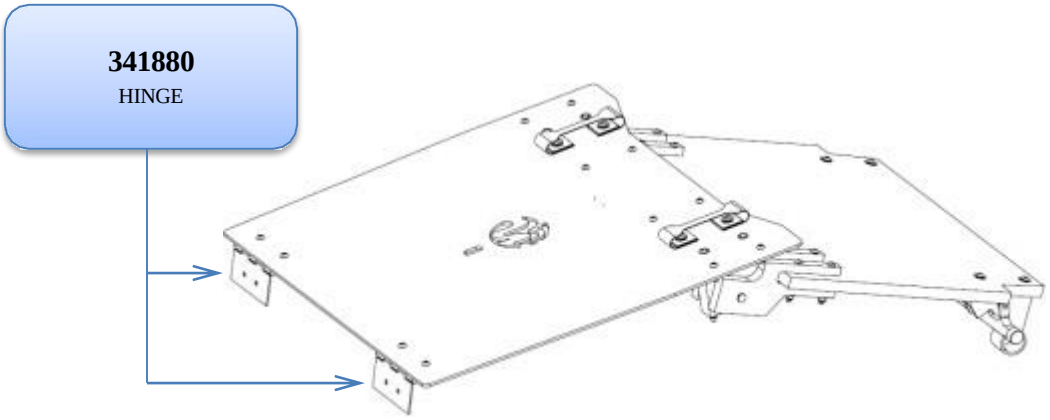



Figure 13: Hinge Locations

| *Maintenance Procedure:* | *Hinge Inspection* |
|---|---|
| Equipment: | Imperial wrenches<br>Torque wrench |
| Materials: | Lithium grease<br>Loctite 242 (blue) |
| Frequency: | Weekly |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Lubricate the hinge(s) using lithium grease.<br>4. Inspect the locknuts that secure the hinge(s) and verify that none are loose.<br>5. If a locknut is found to be loose, replace it with a new one. Apply Loctite 242 (blue) to threads and torque to 20 N-m (15 ft-lb). |

### 2.3.13. Rubber Coupler Inspection

The rubber coupler provides the torque connection between the rotary actuator and the trapdoor. Periodic inspection of the coupler is required. This section will describe how to inspect the coupler.

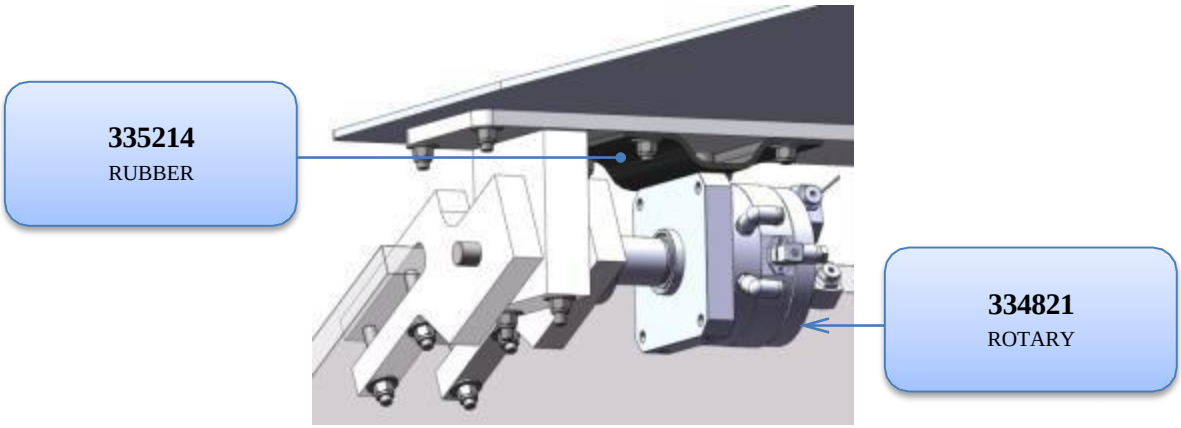



**Figure 14: Rubber Coupler**

| ***Maintenance Procedure:*** | ***Rubber Coupler Inspection*** |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Carefully inspect the rubber coupler for signs of wear or degradation.<br>4. Replace coupler as required. |

### 2.3.14. Pushrod Linkage

The pushrod linkage is responsible for converting the linear motion of the drop cylinder into the rotational motion of the roller bar assembly. When the drop cylinder is retracted, the roller bar rotates backwards towards the drop cylinder; releasing the trapdoor from its supports and dispatching a rider into the slide.

When the trapdoor swings back into the up and locked position, an internal spring within the drop cylinder provides a positive force to push the roller bar forward into the locked position.

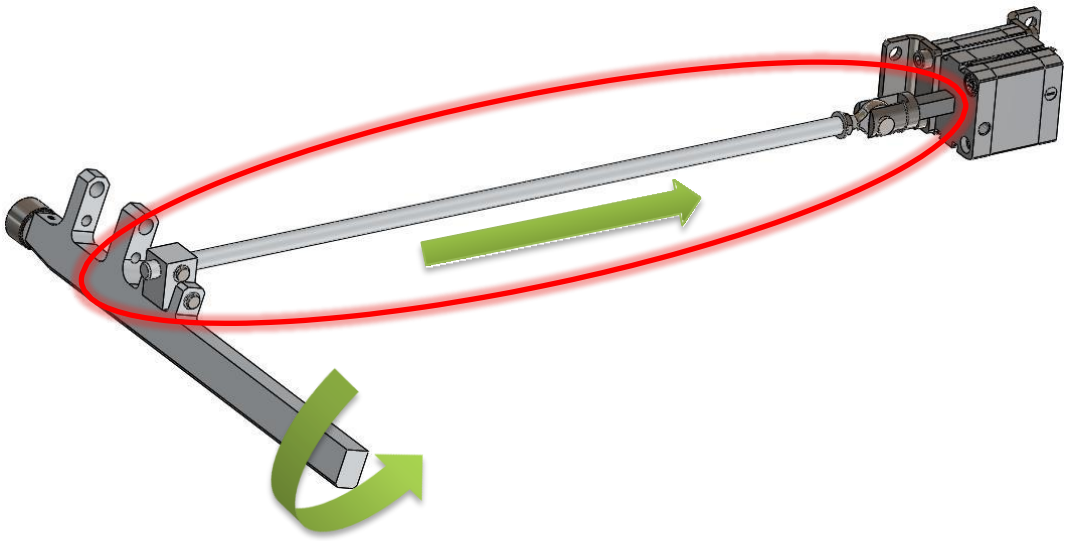


Figure 15: Pushrod Linkage, Overview

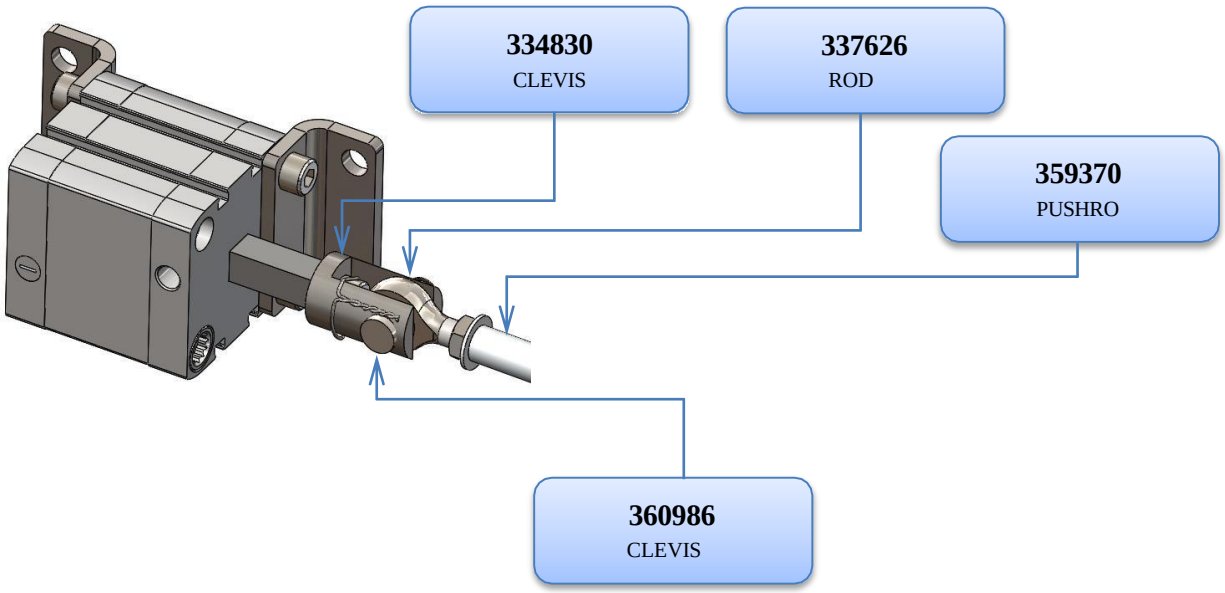



Figure 16: Pushrod Linkage, Drop Cylinder Side

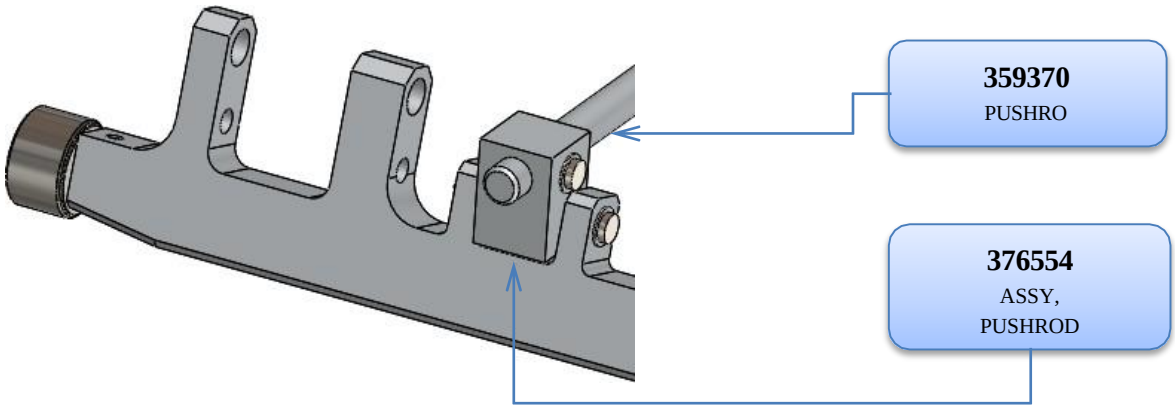
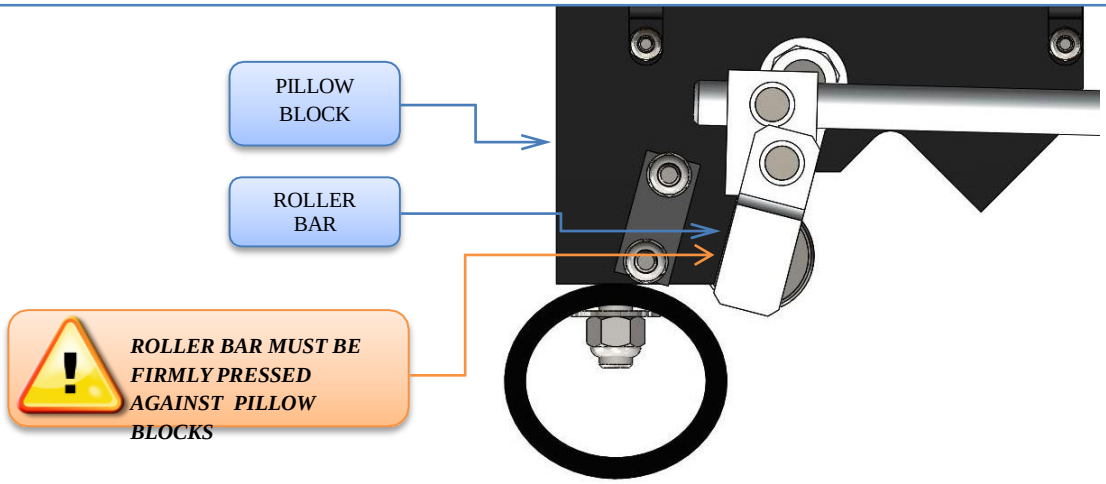



Figure 17: Pushrod Linkage, Roller Bar Side

### 2.3.14.1. Inspecting the Pushrod Linkage

During normal operating conditions, the roller bar should be firmly pressed against the pillow blocks due to the spring force from the drop cylinder. However, over time, the pushrod linkage may become worn, resulting in a loose connection between the drop cylinder and the roller bar. Too much play in this linkage may result in unreliable operation of the trapdoor. The following procedure will describe how to inspect the pushrod linkage.

| *Maintenance Procedure:* | *Inspecting the Pushrod Linkage* |
|---|---|
| Equipment: | Imperial wrenches<br>Retaining ring pliers |
| Materials: | - |
| Frequency: | Weekly |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Turn off the air supply as per Section 3.1.4. Follow proper LOTO procedures.<br>4. With your hand, gently pull back on the roller bar. If you can move the roller bar away from the face of the pillow block by more than 3 mm (1/8”) without overcoming the spring force from the drop cylinder, then the pushrod linkage is either improperly adjusting or excessively worn. |




5. Inspect the pin holes of the pushrod, pushrod connector, roller bar, rod eye and clevis for signs of wear. If excessive wear is observed; i.e. holes have become oval shaped, then the affected parts must be replaced.
6. After all affected parts have been replaced, adjust the pushrod linkage as per Section 2.3.14.2.
7. If no other maintenance is required, lower the trapdoor back into the AquaDrop as per Section 2.3.3.
8. Turn on the air supply.
9. Perform the framing square test as per 4.4.7 to ensure correct adjust of the proximity sensors.
10. Replace the shroud.

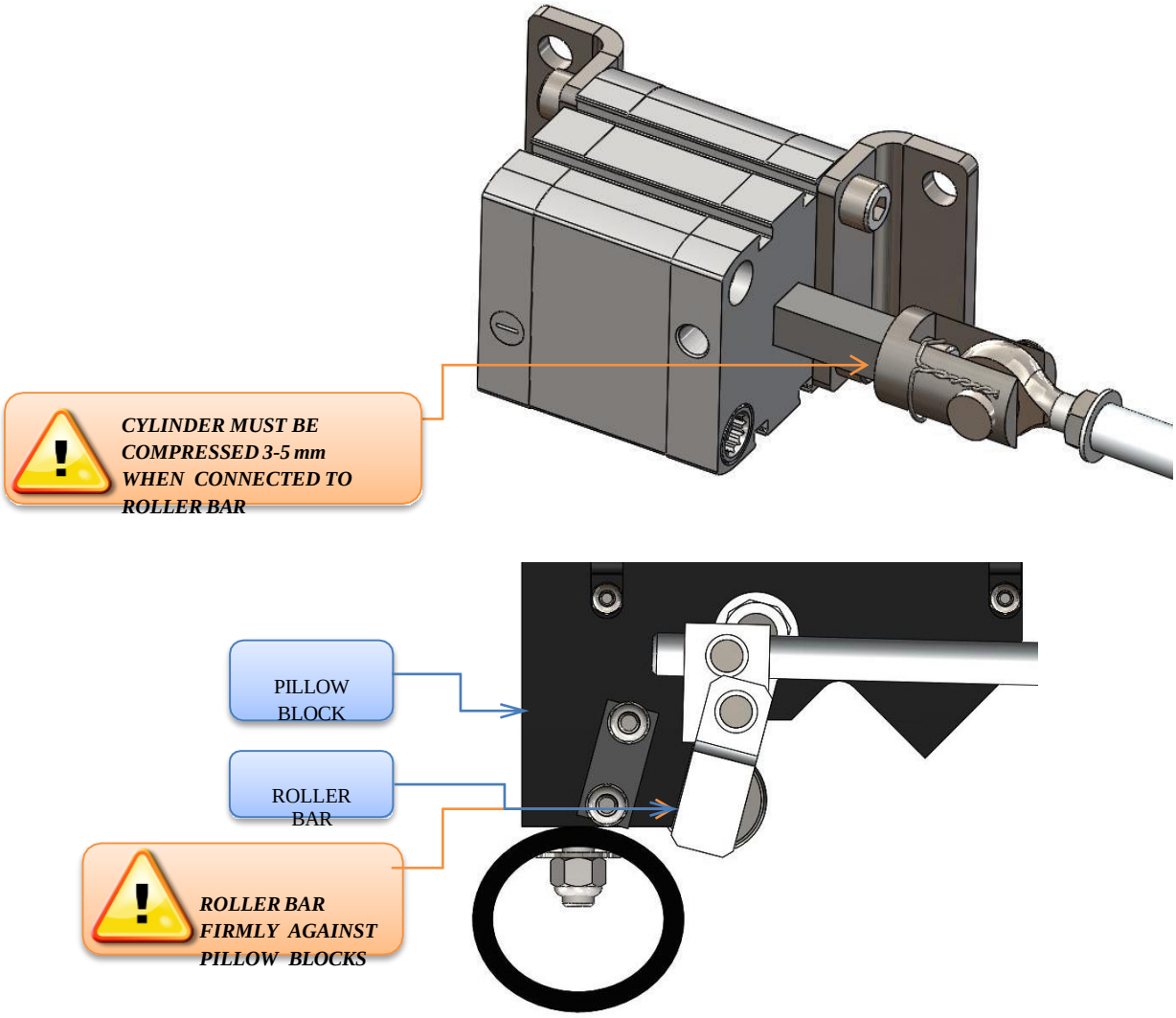
### *2.3.14.2. Adjusting the Pushrod Linkage*

Over time the pushrod linkage may become loose and will require adjustment. The following procedure will describe how to adjust the pushrod linkage.

| ***Maintenance Procedure:*** | ***Adjusting the Pushrod Linkage*** |
|---|---|
| Equipment: | Imperial wrenches<br>Retaining ring pliers |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Turn off the air supply as per Section 3.1.4. Follow proper LOTO procedures.<br>4. Use pliers to remove the retaining ring from the clevis pin and pull the clevis pin out to disengage the cylinder from the linkage.<br>5. Loosen the nut between the rod eye and the pushrod.<br>6. Adjust the depth of the rod eye within the pushrod. The |

rod eye must be adjusted such that when the roller bar is firmly

pressed against the face of the pillow blocks, the drop cylinder is compressed/pre-loaded 3-5 mm (1/8 - 3/16”).




7. Once the pushrod length is properly adjusted, tighten the nut on the rod eye. Apply Loctite 242 (blue) to the threads of the rod eye and nut before tightening.
8. If no other maintenance is required, lower the trapdoor back into the AquaDrop as per Section 2.3.3.
9. Turn on the air supply.
10. Perform the framing square test as per Section **Error! Reference source not found.** to ensure correct adjust of the proximity sensors.
11. Replace the shroud.

## 2.4. *Entry Door Assembly*

The entry door is a mechanically actuated door which is responsible for allowing riders to enter the launch capsule. The primary components of the entry door assembly are shown below.

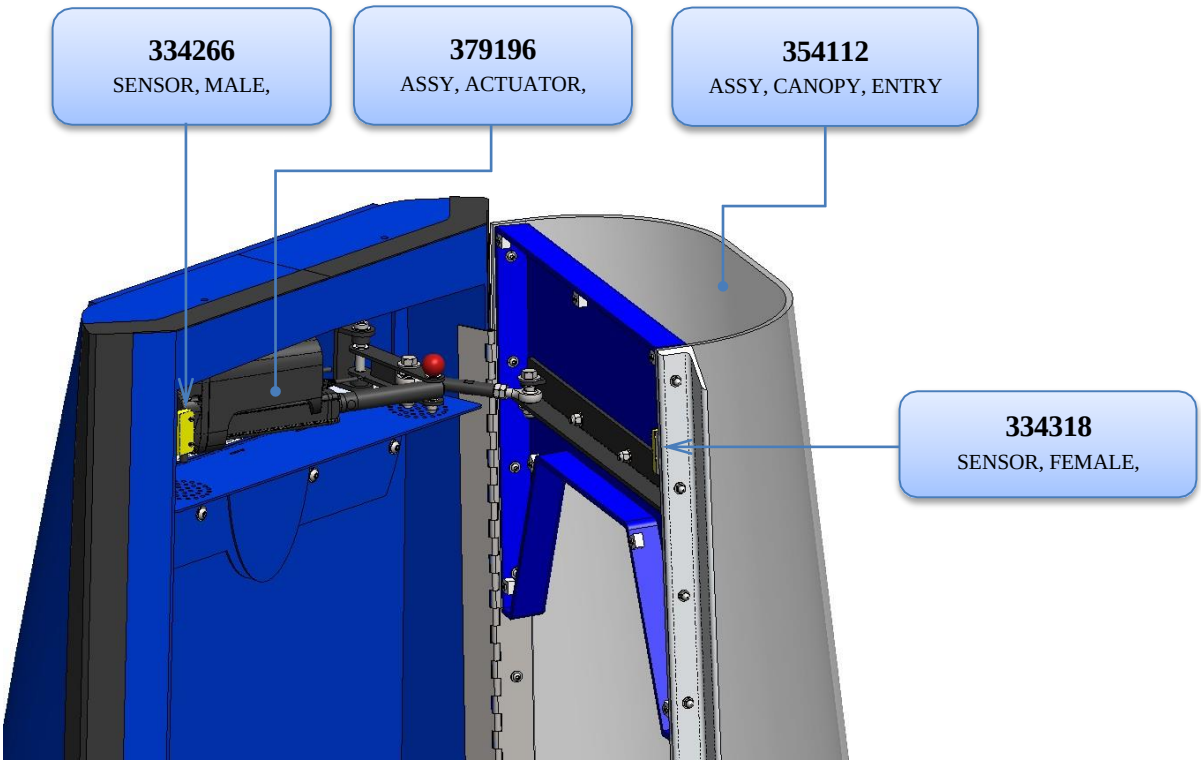
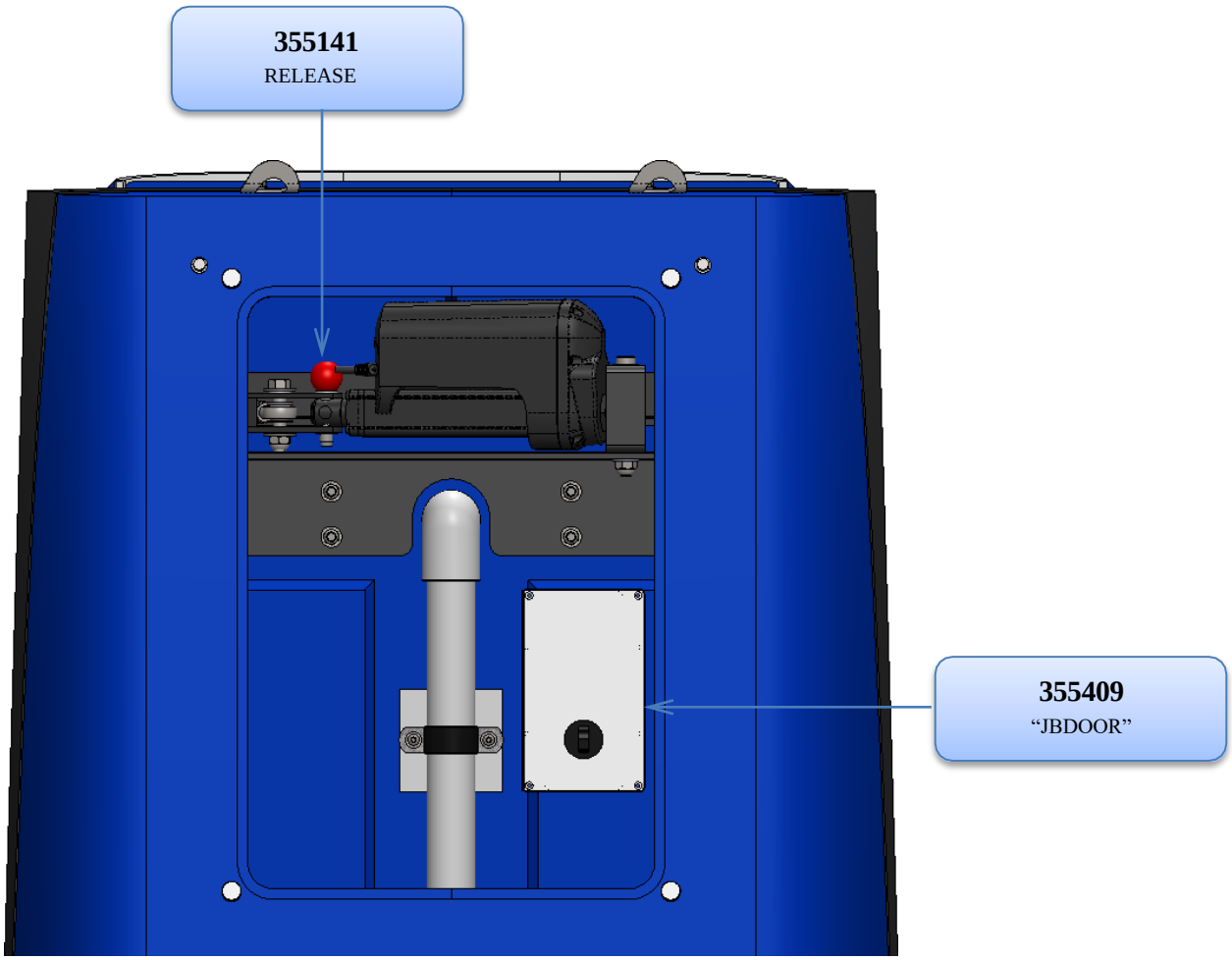



**Figure 18: Entry Door Assembly, Front View**




tion

### 2.4.1. Entry Door Inspec

Figure 19: Entry Door Assembly, Rear View

The entry door requires periodic inspection to check for cracks and damage. This section will describe the inspection procedure.

| *Maintenance Procedure:* | *Entry Door Inspection* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Visually inspect the entire entry door for signs of damage, including chips and cracks.<br>2. If any cracks are found in the door, immediately stop operation of the slide and contact WhiteWater. |

### 2.4.2. Cleaning the Entry Door Acrylic

The entry door acrylic requires periodic cleaning to prevent material buildup from occurring and to maintain its appearance. This section will describe the cleaning procedure.

| *Maintenance Procedure:* | *Cleaning the Entry Door Acrylic* |
|---|---|
| Equipment: | Soft, lint free cloth, solution of mild detergent, chamois |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Remove the Operations Key from the "RCC1" panel as per Section 4.2.1.<br>2. Turn off the air supply as per Section 3.1.4. Follow proper LOTO procedures.<br>3. Disengage the entry door as per Section 2.4.3.<br>4. Clean the interior and exterior of the acrylic entry door with a mild solution of soap or detergent and lukewarm water.<br>5. Use a soft cloth or sponge to gently loosen any dirt or debris and rinse well with water.<br>6. A chamois or cellulose sponge may be used to dry the acrylic. |

### 2.4.3. Disengaging the Entry Door for Maintenance/Emergency Release

Certain maintenance and operational procedures require the entry door to be opened manually. This section will describe how to open the door manually.

***DO NOT OPERATE THE ENTRY DOOR MANUALLY DURING NORMAL OPERATIONS! THIS WILL BYPASS THE SAFETY SYSTEM AND MAY RESULT IN INJURY TO THE RIDER!***

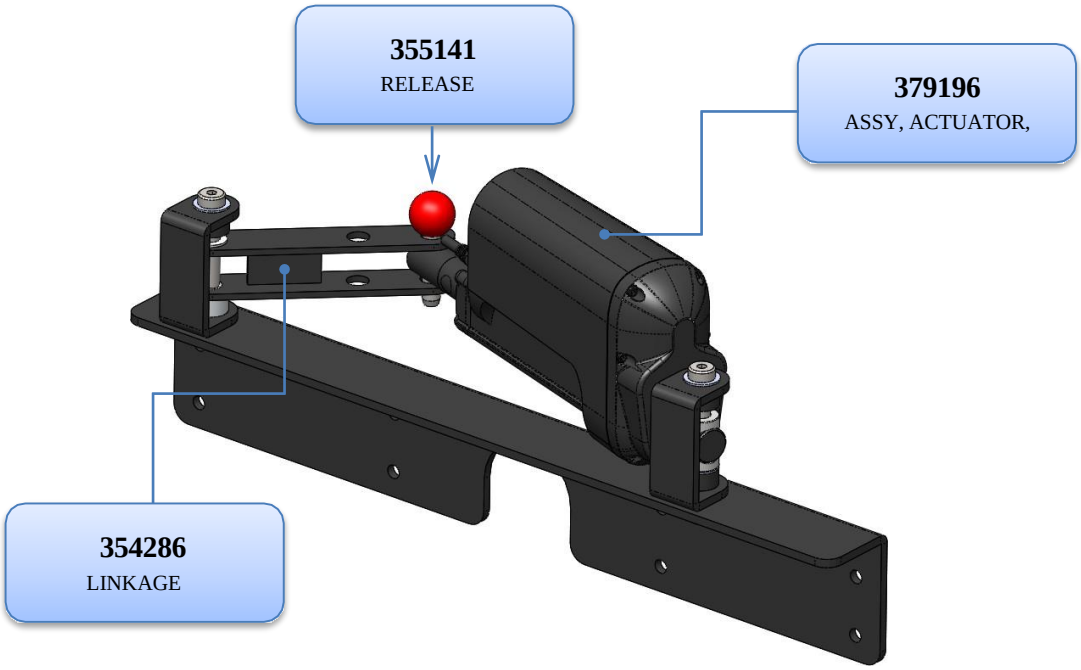


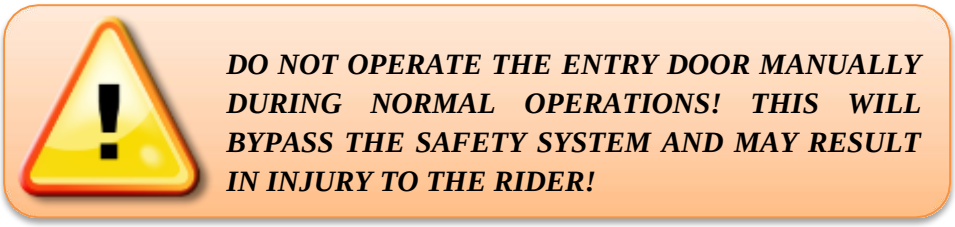

Figure 20: Entry Door, Linear Actuator Assembly

| *Maintenance Procedure:* | *Disengaging the Entry Door for Maintenance/Emergency Release* |
|---|---|
| Equipment: | Step ladder |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Secure all personnel against falling when working around the flume opening, in accordance with local workplace safety regulations.<br>2. Remove the Operations Key from the “RCC1” panel as per Section 4.2.1.<br>3. Remove the upper access panel from the back of the launch capsule. |

| | |
|---|---|
| | 4. Turn the switch on the “JBDOOR” panel to the OFF position.<br>5. Use a small step ladder, if needed, to pull up on and remove the release pin connecting the linkage bar and linear actuator. *Note: If the pin is stuck you will need to push the door forward slightly to remove the load from the linkage.*<br>6. The door is now free to open and close without power. |

### 2.4.4. Re-engaging the Entry Door for Normal Operations

If the entry door has been disengaged to perform certain maintenance and operational procedures, it will need to be re-engaged to resume normal operations. This section will describe how to re-engage the entry door.




| *Maintenance Procedure:* | *Re-engaging the Entry Door for Normal Operations* |
|---|---|
| Equipment: | Step ladder |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Ensure the Operations Key is removed from the “RCC1” panel.<br>2. Ensure the switch on the “JBDOOR” panel is in the OFF position.<br>3. Insert the release pin through the linkage bar and the end of the linear actuator. Push the pin all the way down through the bottom of the linkage bar.<br>4. Turn the switch on the “JBDOOR” panel to the ON position.<br>5. Replace the upper access panel to the back of the launch.<br>6. Return the Operations Key to the “RCC1” panel. |

### 2.4.6. Entry Door Hinge Inspection

The entry door is attached to the fiberglass launch capsule with a piano hinge. Periodic inspection of the hinges and fasteners is required. This section will describe how to inspect and tighten the hinge bolts.

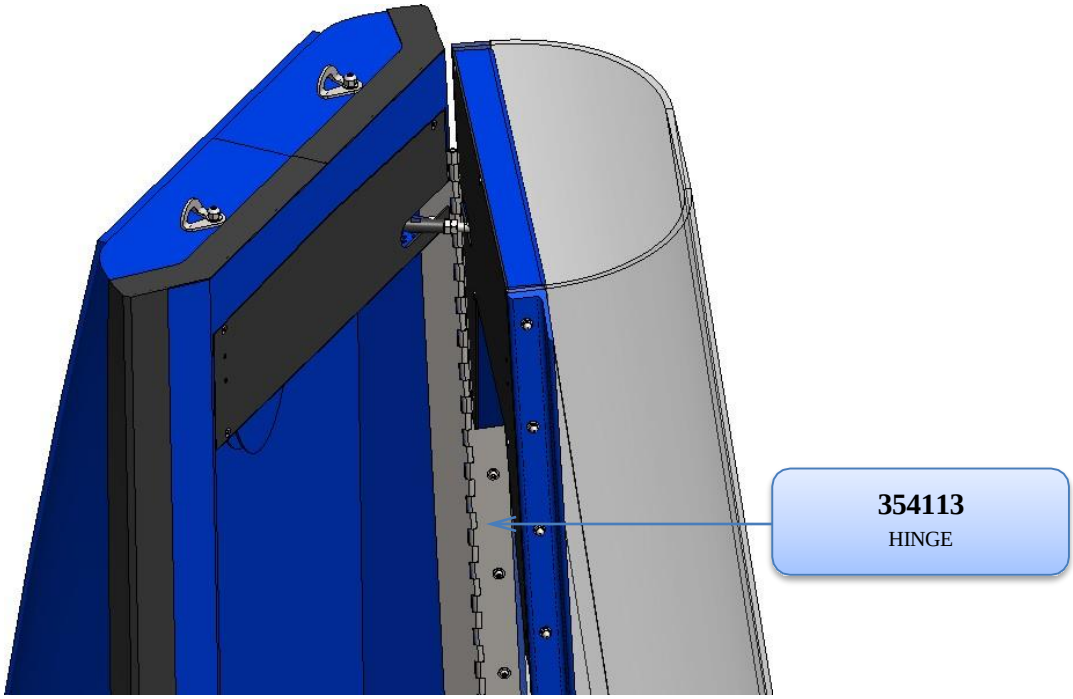



Figure 21: Entry Door Hinge

| *Maintenance Procedure:* | *Entry Door Hinge Inspection* |
|---|---|
| Equipment: | Imperial Allen keys<br>Imperial wrenches<br>Torque wrench |
| Materials: | - |
| Frequency: | Weekly |
| Procedure: | 1. Visually inspect the hinge and ensure that it's securely attached to the launch capsule and entry door.<br>2. Tighten any loose bolts to 13 N-m (10 ft-lb), but do not over tighten as this may damage the acrylic door.<br>3. Wipe the hinge with a lint free cloth and water to remove any buildup, dirt or debris and rinse with water. |

### 2.4.7. Replacing the Linear Actuator

The linear actuator is used to provide mechanical force to open and close the entry door. In the event that the actuator fails, it will need to be removed and replaced. This section will describe how to replace the linear actuator.

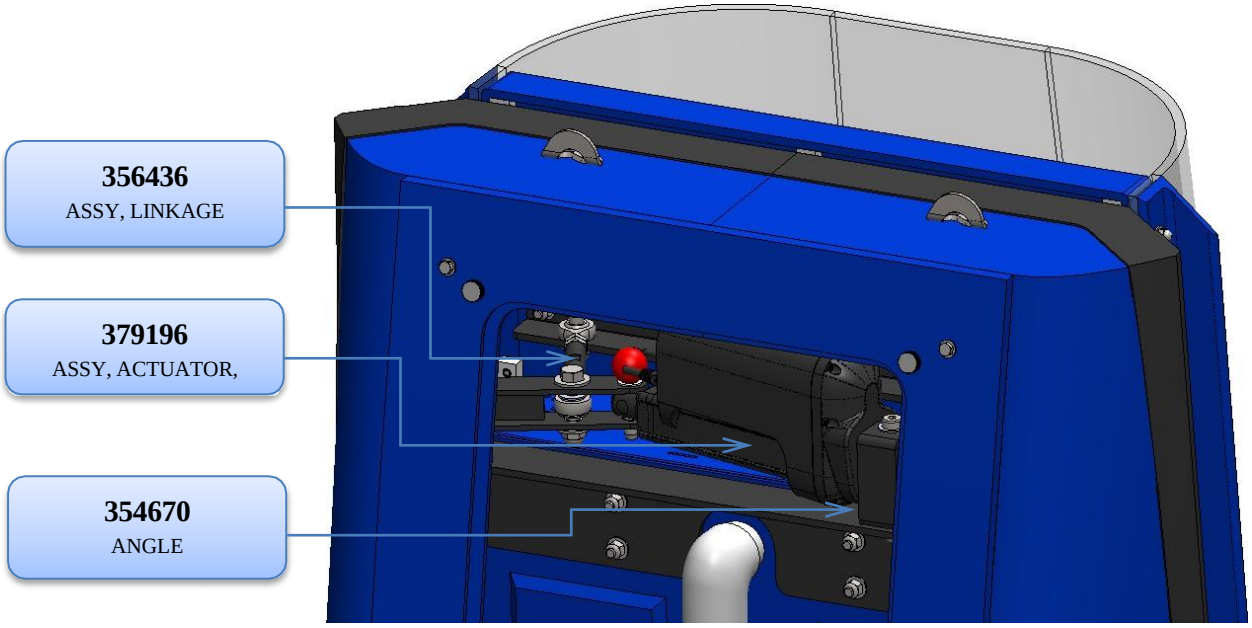



Figure 22: Linear Actuator Assembly

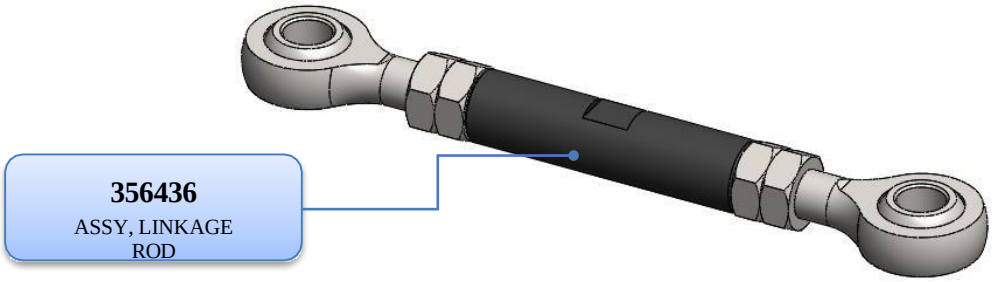



Figure 23: Linkage Rod Detail

| *Maintenance Procedure:* | *Replacing the Linear Actuator* |
|---|---|
| Equipment: | Imperial Allen keys<br>Imperial wrenches<br>Step ladder |
| Materials: | 379196-ASSY, ACTUATOR, LINEAR, QTY = 1 |
| Frequency: | As required |
| Procedure: | 1. Disengage the entry door as per Section 2.4.3.<br>2. Disconnect the cable on the linear actuator from the "JBDOOR" panel at the back of the launch capsule.<br>3. Remove the shoulder bolt that connects the linear actuator to the angle bracket and remove the defective actuator. *Be careful not to lose any fasteners.*<br>4. Complete the reassembly of the new linear actuator.<br>5. Re-engage the entry door to the linkage assembly as per Section 2.4.4.<br>6. Ensure that the release pin is easy to remove when connected to the linkage bar and linear actuator when the linear actuator is fully retracted. If not, use a wrench on the flats of the linkage rod to adjust the position of the door. |

### 2.4.8. Replacing Safety Switch Components

The safety switch is another important feature of the safety system and is used to tell the system when the entry door is closed. The safety switch is composed of two components: the switch which is mounted within the launch capsule, and the switch actuator which is mounted to the entry door. Over time, one or both of these switch components may fail and require replacement. This section will describe how to replace both switch components.

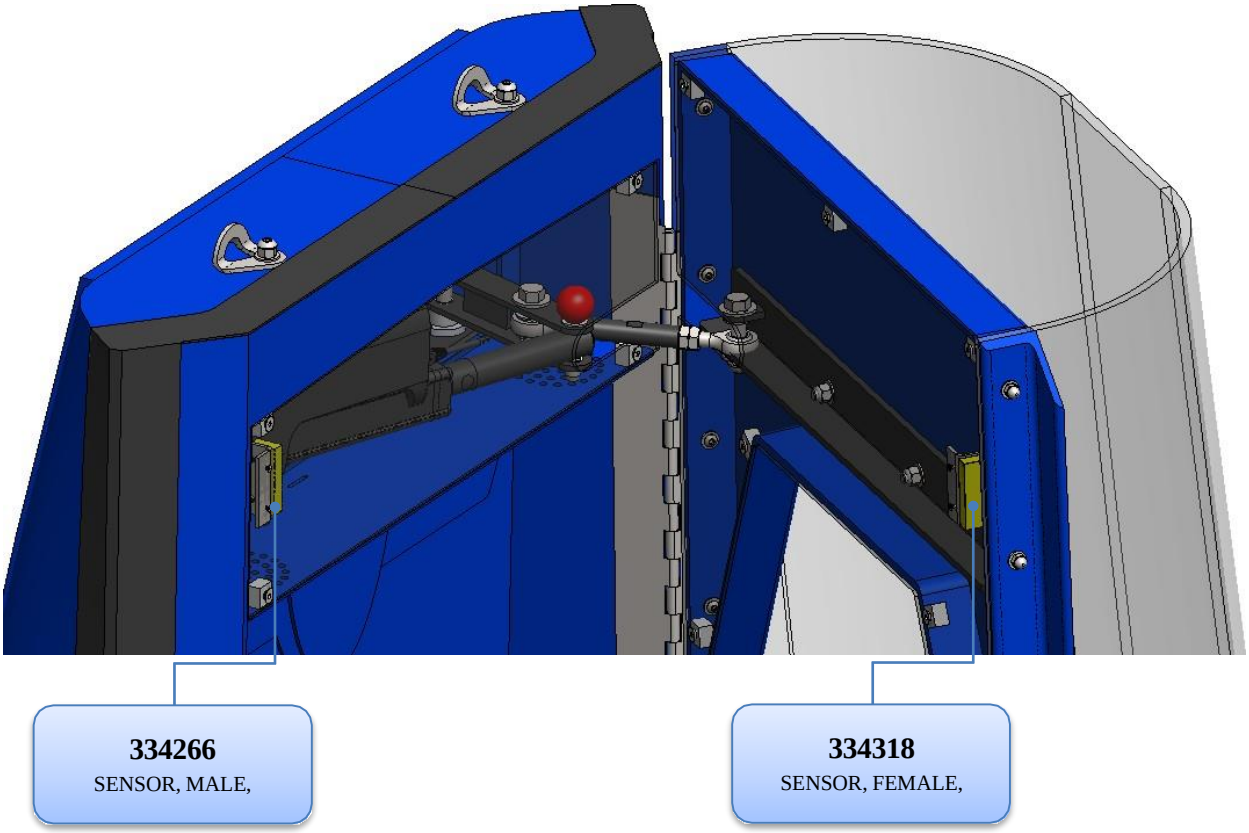



Figure 24: Safety Switch Details

| *Maintenance Procedure:* | *Replacing Safety Switch Components* |
|---|---|
| Equipment: | Imperial Allen keys<br>Imperial wrenches |
| Materials: | 334266-SENSOR, MALE, SAFETY, QTY = 1<br>334318-SENSOR, FEMALE, SAFETY, QTY = 1 |
| Frequency: | As required |
| Procedure: | 1. Disengage the entry door as per Section 2.4.3.<br>2. To replace the male sensor, remove the cover panel at the top of the launch. Unscrew the cable from the sensor and remove the fasteners securing the switch to the mounting bracket. |

3. Replace the old switch with the new one. Connect the cable to the new switch and secure the switch to the mounting bracket using the fasteners.
4. Reinstall the cover panel to the top of the launch.
5. To replace the female sensor, remove the cover panel from the top of the entry door. Remove the fasteners which secure the sensor to the mounting bracket.
6. Replace the sensor with the new one and secure it to the mounting bracket using the fasteners

## 3. Pneumatics

The AquaDrop uses compressed air and various pneumatic components for the majority of its automated movements. A compressor must be installed in order to supply the AquaDrop with the air pressure required for operation. The pressure setting on the compressor should be above the operating pressure of the AquaDrop.

***COMPRESSOR AIR PRESSURE***
***> 689 kPa [100 psi]***

***DRY AIR IS REQUIRED TO PROVIDE SAFE AND RELIABLE OPERATION OF PNEUMATIC COMPONENTS***

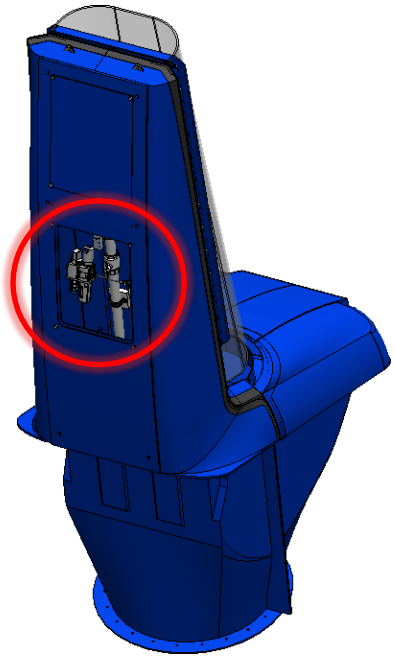


Figure 25: Location of Pneumatic Components

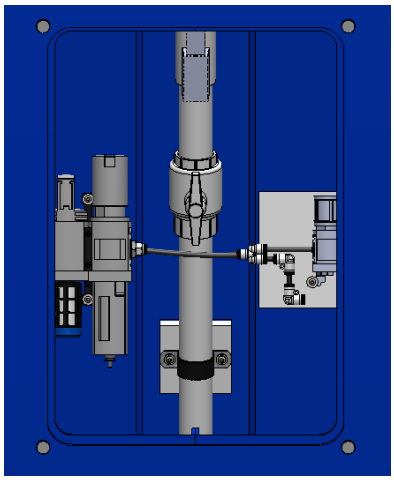
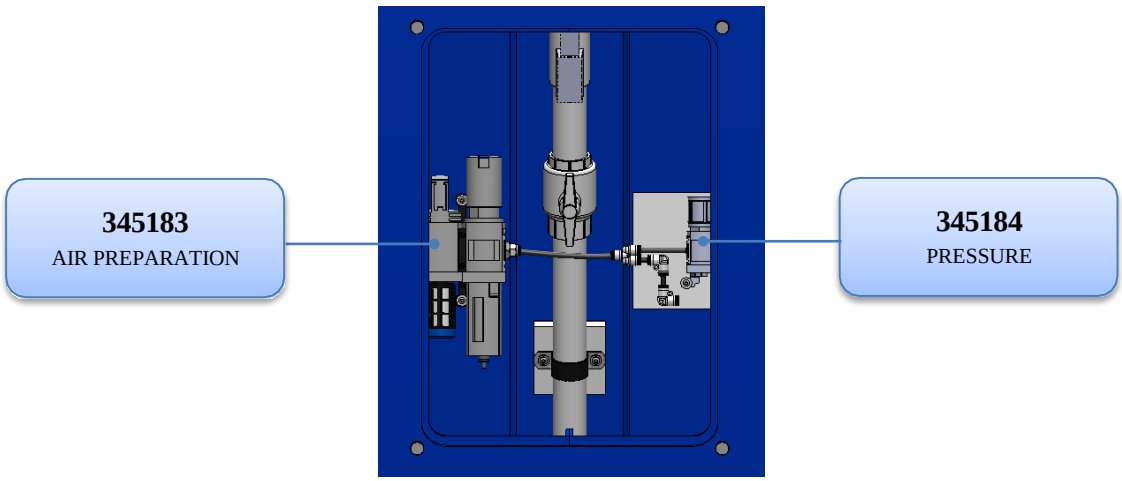


Figure 26: Detail View of Pneumatic Components




## 3.1. *Air Supply*

Figure 27: Detail View of Pneumatic Components

### 3.1.1. Air Preparation Unit

An air preparation unit, as shown below, is used to filter and regulate the air supplied to various pneumatic components. This unit regulates the air pressure supplied to the drop cylinder components and must not exceed 689 kPa [100 psi].


MAX AIR PRESSURE
689 kPa [100 psi]

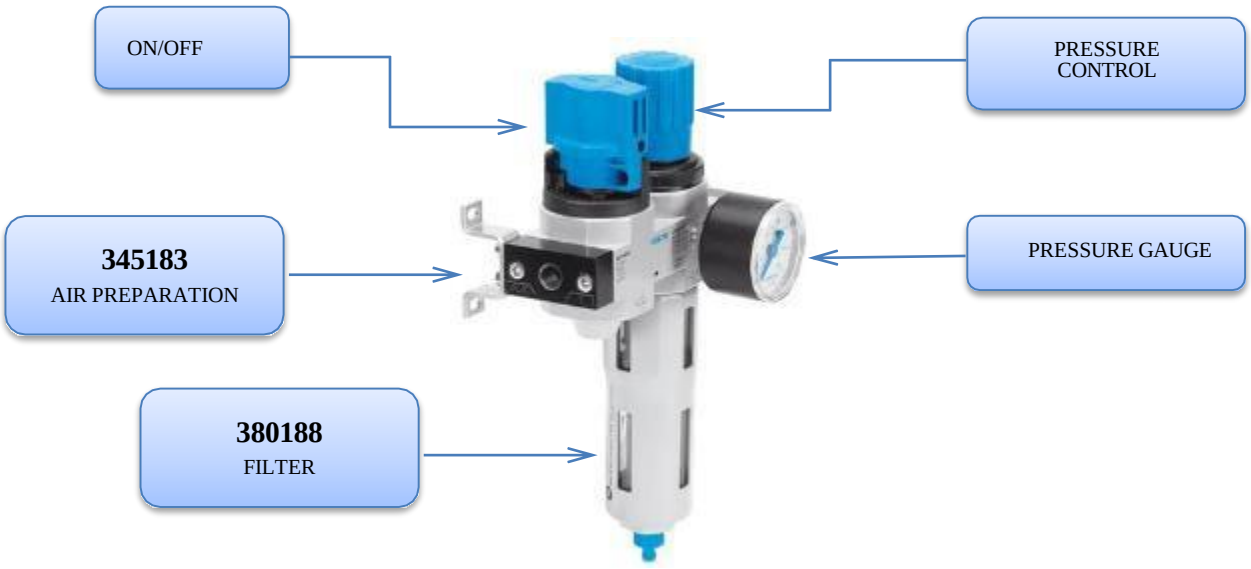



Figure 28: Air Preparation Unit

### 3.1.2. Pressure Regulator for Rotary Actuator

An additional pressure regulator is provided downstream of the air preparation unit to regulate the pressure supplied to the rotary actuator. This pressure must not exceed 552 kPa [80 psi].



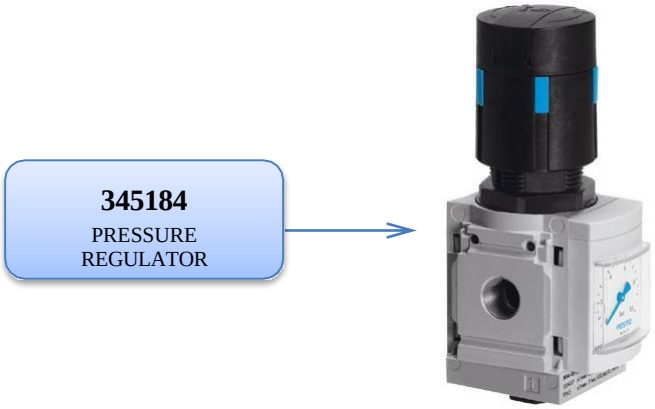




Figure 29: Pressure Regulator for Rotary Actuator

### 3.1.3. Flow Control Valve for Drop Cylinder

A flow control valve is located between the two solenoid valves used to actuate the drop cylinder. The purpose of this valve to regulate the air flow into the drop cylinder, allowing the trapdoor to drop at the minimum required pressure for the given rider weight.

The valve is factory set to successfully launch the maximum rider weight; however, the opening may be adjusted to account for various external factors.

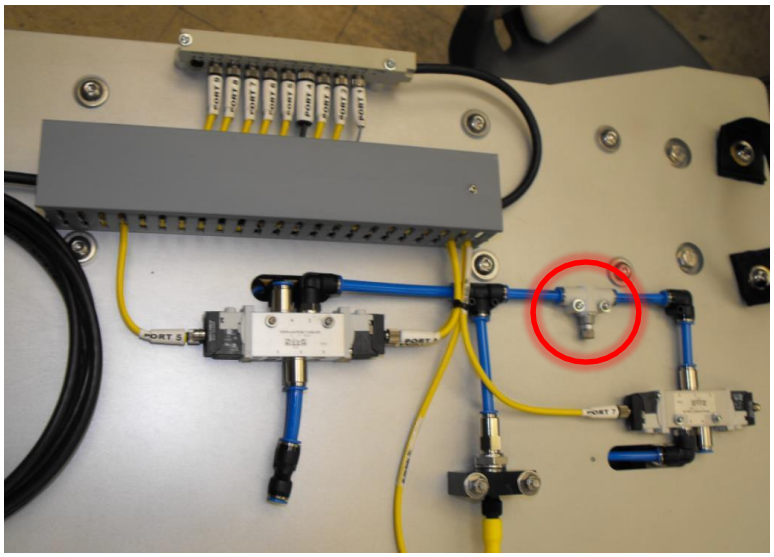
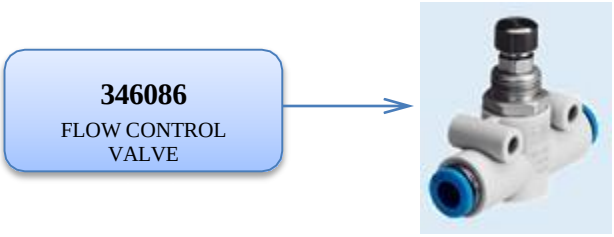


Figure 30: Trapdoor Assembly-Pneumatic Components




**Air Supply**

### 3.1.4. Turning off

Figure 31: Flow Control Valve

When performing maintenance operations it is important to shut off the air supply to prevent accidental pneumatic actuator movement. This section will describe how to turn off the air supply.

| *Maintenance Procedure:* | *Turning off Air Supply* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove the lower access panel from the back of the launch.<br>2. Turn the on/off valve on the air preparation unit counterclockwise. |

| | |
|---|---|
| | 3. You will hear air discharge and the pressure gauge will read 0 kPa [0 psi]. |

### 3.1.5. Adjusting Unit Air Pressure

If the air pressure is set incorrectly, the trapdoor may bang loudly when released, fail to catch in the traps, or may fail to launch riders near the upper weight limit. This section will describe how to adjust the air pressure.

| *Maintenance Procedure:* | *Adjusting Unit Air Pressure* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove the lower access panel from the back of the launch.<br>2. Adjust the pressure regulator supplying the rotary actuator to the lowest air pressure at which the trapdoor will open in one swing and close in one swing.<br>3. Turn the pressure control valve clockwise to increase the air pressure or counterclockwise to decrease the air pressure. The air pressure is displayed on the pressure gauge. |




### 3.1.6. Replacing Filter

Periodically, the filter in the air preparation unit will need to be replaced. This section will describe how to replace the filter.

| *Maintenance Procedure:* | *Replacing Filter* |
|---|---|
| Equipment: | - |
| Materials: | 380188-FILTER CARTRIDGE, QTY = 1 |
| Frequency: | Annually |

| | |
|---|---|
| Procedure: | 1. Remove the lower access panel from the back of the launch.<br>2. Turn off the air supply as per Section 3.1.4. Follow proper LOTO procedures.<br>3. Turn the filter counterclockwise to remove it.<br>4. Replace the air filter and turn clockwise until it is tight.<br>5. Turn on the air supply. |

## 3.2. *Solenoid Valves*

Solenoid valves are used on the trapdoor assembly to control the motion of the rotary actuator and the drop cylinder.

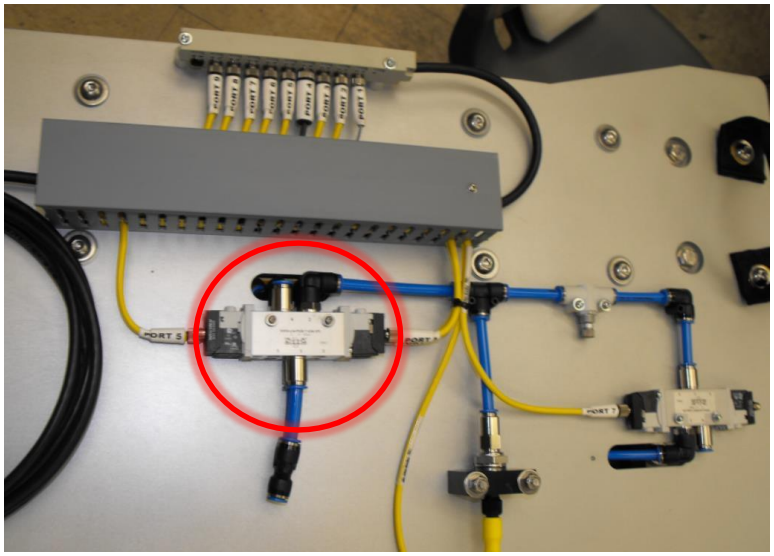


Figure 32: Trapdoor Assembly-Pneumatic Components

### 3.2.1. Replacing a Solenoid Valve

If a solenoid operated directional control valve begins to leak or stops working it will be necessary to replace it. This section will describe how to replace a solenoid valve.

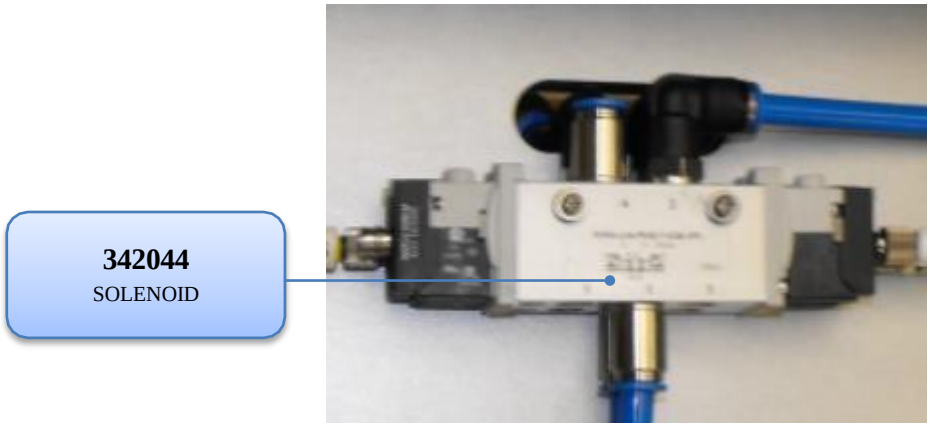



Figure 33: Solenoid Valve Detail

| *Maintenance Procedure:* | *Replacing a Solenoid Valve* |
|---|---|
| Equipment: | Philips head screw driver |
| Materials: | Loctite Marine Grade Anti-Seize |
| Frequency: | Annually, or as required |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2. |

6. Turn off the air supply as per Section **Error! Reference source not found.**. Follow proper LOTO procedures.
3. Disconnect the push-to-connect fittings and unscrew the signal cable from the defective valve.
4. Remove the two screws from the defective solenoid valve.
5. Replace the push-to-connect fittings and signal cable on the new solenoid valve. Ensure that they are in the same locations as they were originally.

## 3.3. *Rotary Actuator*

The rotary actuator is used to energize the trapdoor while it's swinging to ensure it has sufficient momentum to reach the traps and lock in place.

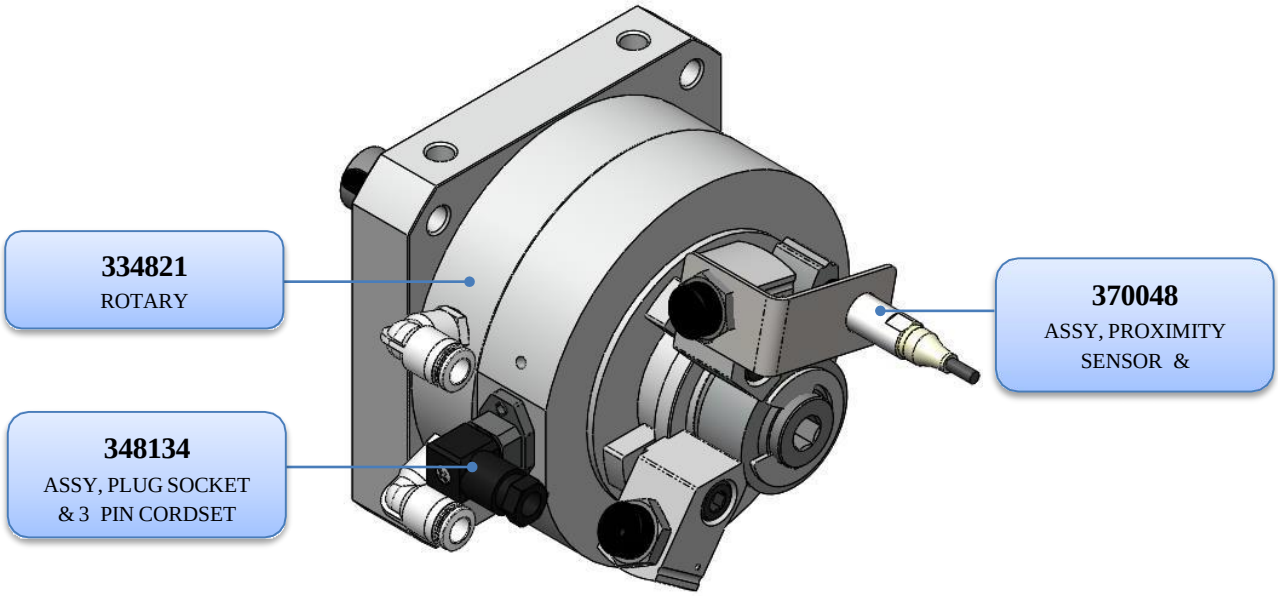



**Figure 34: Rotary Actuator Components**

### 3.3.1. Rotary Actuator Replacement

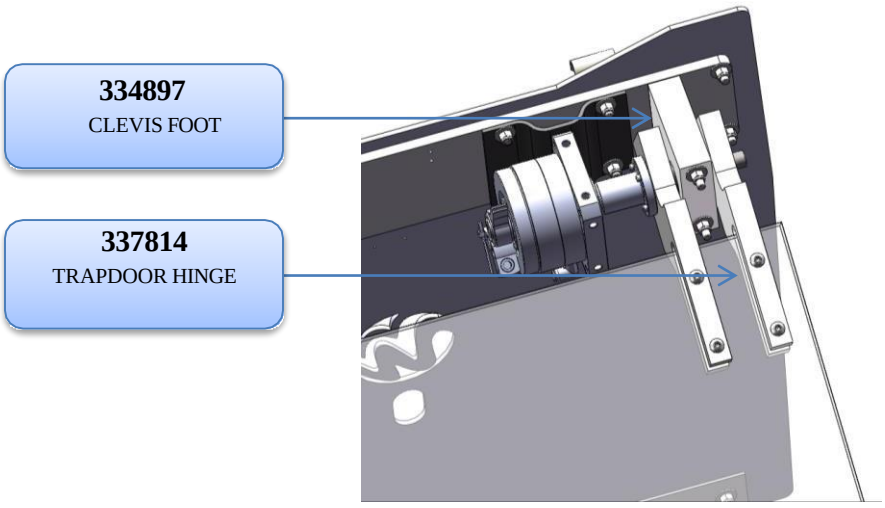
Overtime, the actuator may fail and require replacement. This section will describe how to replace the rotary actuator.

| *Maintenance Procedure:* | *Replacing the Rotary Actuator* |
|---|---|
| Equipment: | Imperial Wrenches<br>Imperial & Metric Allen keys<br>Torque wrench |
| Materials: | 334821-ROTARY ACTUATOR, QTY = 1<br>Loctite Marine Grade Anti-Seize<br>Loctite 242 (blue) |

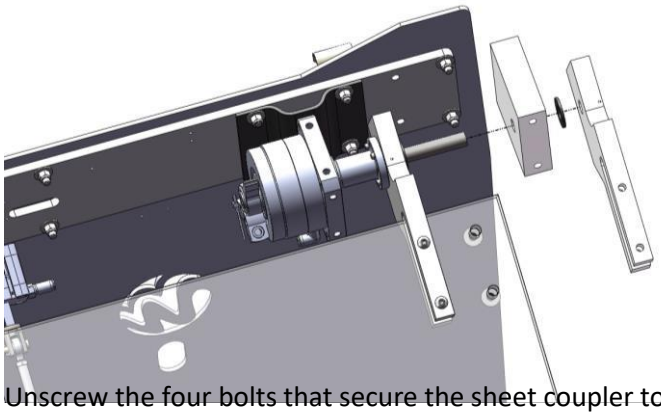
| | |
|---|---|
| Frequency: | As required |

Procedure:

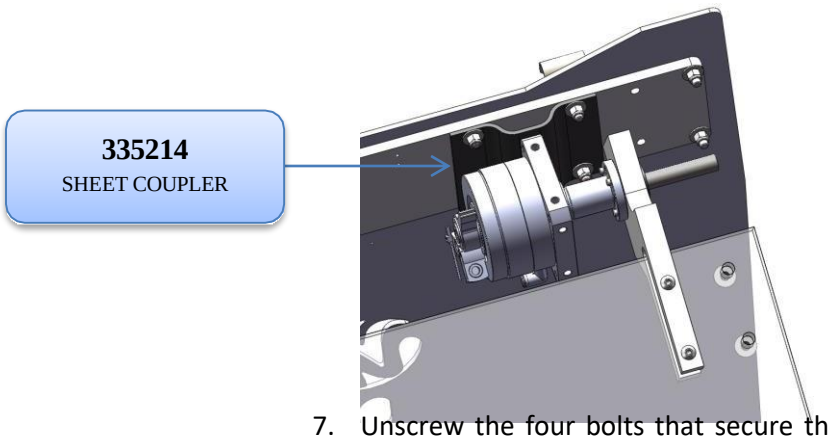
1. Remove the shroud as per Section 2.1.
2. Prepare the trapdoor for maintenance as per Section 2.3.2.
7. Turn off the air supply as per Section **Error! Reference source not found.**. Follow proper LOTO procedures.
3. Disconnect the two push-to-connect fittings, unplug the electrical connector, and remove the proximity sensor.
4. Unscrew the two bolts that fasten the clevis foot to the trapdoor mount plate and unscrew the two bolts that secure the hinge to the trapdoor panel.



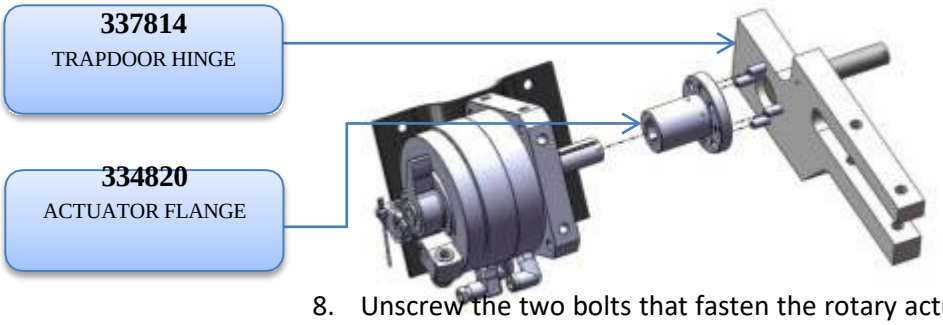

5. Remove the clevis foot and hinge from the shaft.



6. Unscrew the four bolts that secure the sheet coupler to the mounting plate.




7. Unscrew the four bolts that secure the rotary actuator flange to the trapdoor hinge and unscrew the bolt that secures the rotary actuator flange to the rotary actuator shaft.

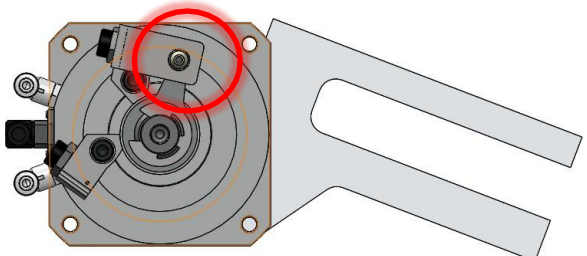



8. Unscrew the two bolts that fasten the rotary actuator to the sheet coupler and remove the defective actuator.



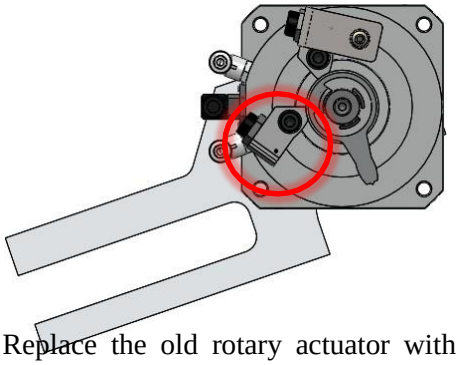
9. Ensure that the stopper (with the sensor) on the new rotary actuator is rotated, such that it does not contact the moving/rotating arm when the trapdoor is closed. Torque to 38 N-m (28 ft-lb).

*TRAPDOOR CLOSED*



10. Ensure that the stopper (without the sensor) is rotated such that it does not contact the moving/rotating arm when the trapdoor is open. Torque to 38 N-m (28 ft-lb).

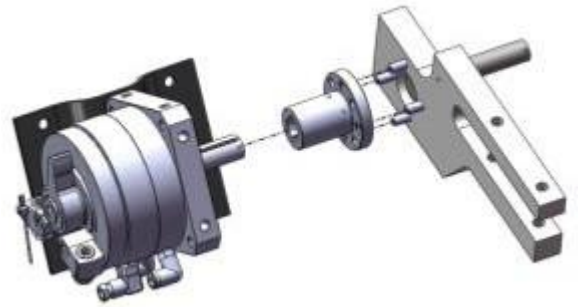
*TRAPDOOR OPEN*



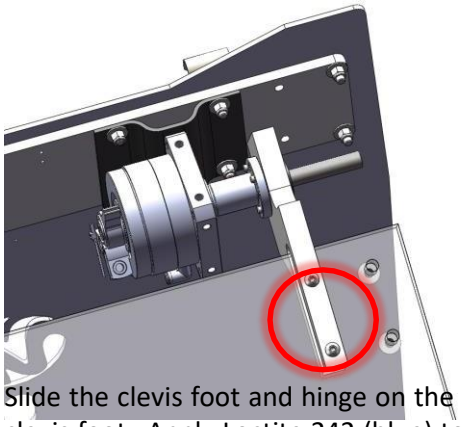
11. Replace the old rotary actuator with the new one and reassemble as per the following instructions.
12. Fasten the new actuator to the sheet coupler. Apply Loctite 242 (blue) to the fasteners and torque to 14 N-m (10 ft-lb).



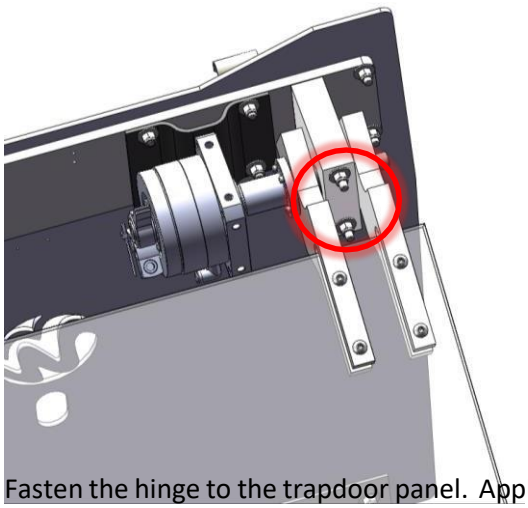
13. Fasten the flange to the hinge and slide the flange on the rotary actuator shaft. Apply Loctite 242 (blue) to the fasteners and torque to 14 N-m (10 ft-lb).



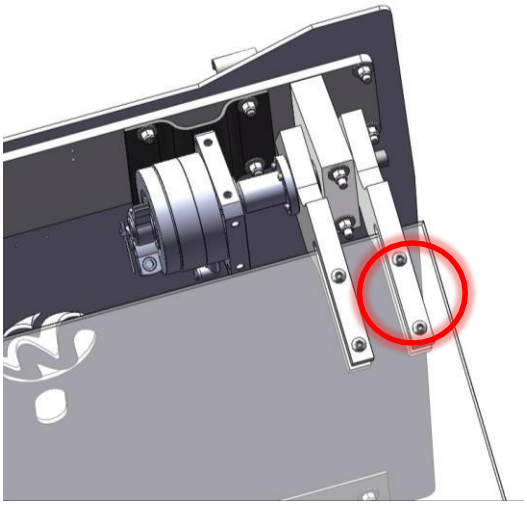
14. Fasten the hinge to the trapdoor panel. Apply Loctite 242 (blue) to the fasteners and torque to 14 N-m (10 ft-lb). **DO NOT OVERTIGHTEN! This may crack the trapdoor panel.**



15. Slide the clevis foot and hinge on the pin and fasten the clevis foot. Apply Loctite 242 (blue) to the fasteners and torque to 20 N-m (15 ft-lb).



16. Fasten the hinge to the trapdoor panel. Apply Loctite 242 (blue) to the fasteners and torque to 14 N-m (10 ft-lb). **DO NOT OVERTIGHTEN! This may crack the trapdoor panel.**



17. If no other maintenance is required, lower the trapdoor back into the AquaDrop.
18. Turn on the air supply.
19. Replace the shroud.

## 3.4. *Trapdoor Drop Cylinder*

As the name implies, the trapdoor drop cylinder is used to disengage the locking mechanism and drop the trapdoor.

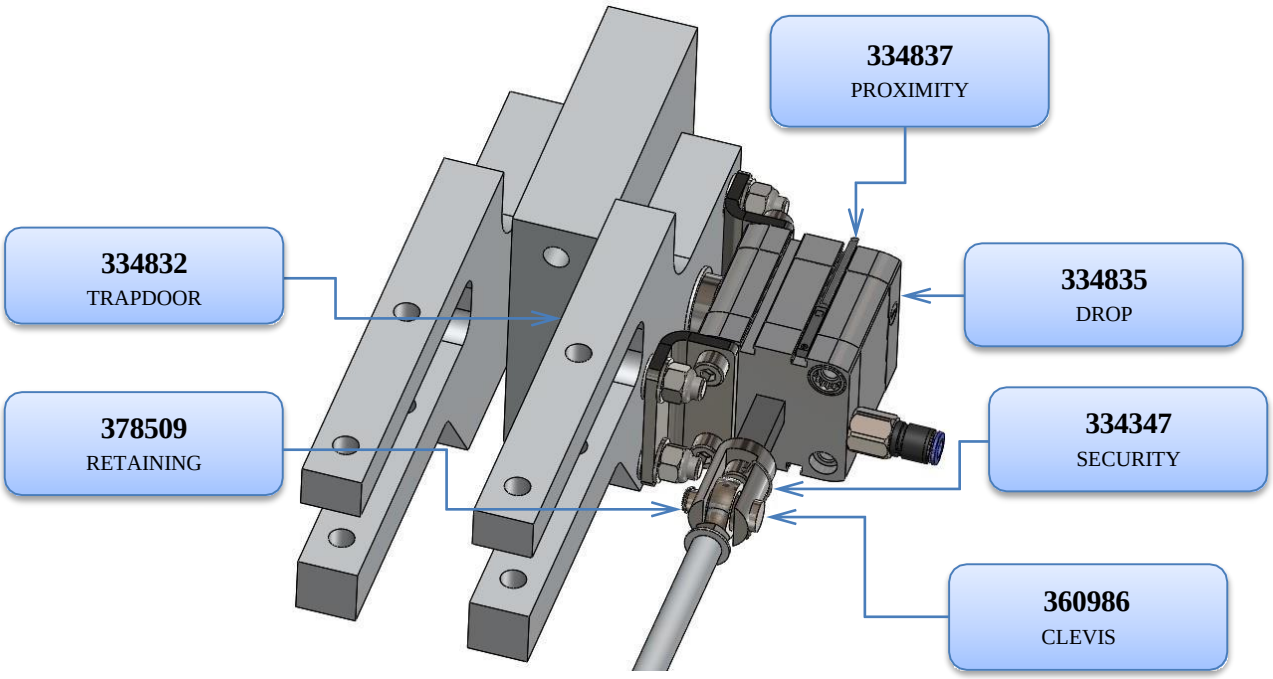


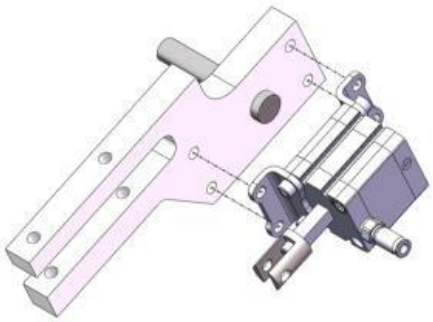

Figure 35: Drop Cylinder Overview

### 3.4.1. Replacing the Trapdoor Drop Cylinder

Over time, the cylinder may fail and require replacement. This section will describe how to replace the trapdoor drop cylinder.

| *Maintenance Procedure:* | *Replacing the Trapdoor Drop Cylinder* |
|---|---|
| Equipment: | Imperial wrenches<br>Imperial and Metric Allen keys<br>Retaining ring pliers<br>Torque wrench |
| Materials: | 334835-DROP CYLINDER<br>334347-SECURITY WIRE<br>Loctite 242 (blue) |
| Frequency: | As required |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Turn off the air supply as per Section **Error! Reference source not found.**. Follow proper LOTO procedures.<br>4. Disconnect the push-to-connect fittings to remove the proximity sensor from the defective cylinder. |

5. Use pliers to remove the retaining ring from the clevis pin and pull the clevis pin out to disengage the cylinder from the linkage.
6. Unscrew the four bolts which fasten the cylinder to the trapdoor hinge.



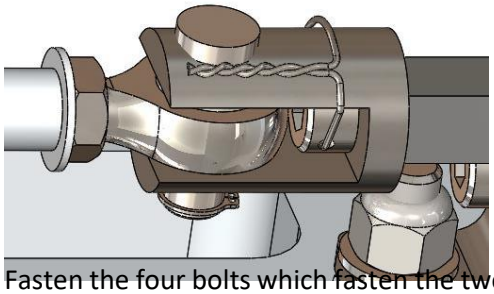
7. Unscrew the four bolts which fasten the two mounting feet to the cylinder.



8. Remove the security wire from the bolt head and unscrew the bolt which fastens the clevis to the end of the cylinder.



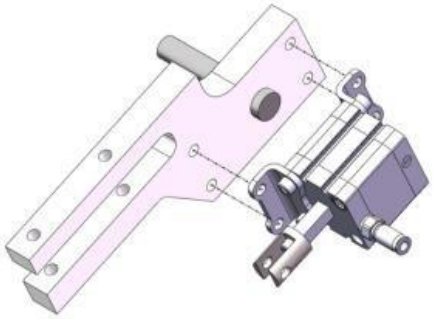
9. Replace the defective cylinder with the new one and reassemble as per the following instructions.
10. Fasten the clevis to the drop cylinder. Clean the screw hole with acetone and use permanent Loctite 262 (red). Torque to 24 N-m (18 ft-lb).
11. Replace the security wire with a new one, feed it through the bolt head and twist the ends.



12. Fasten the four bolts which fasten the two mounting feet to the cylinder. Apply Loctite 242 (blue) to the threads. Torque to 24 N-m (18 ft-lb).



13. Fasten the four bolts which secure the cylinder to the trapdoor hinge. Apply Loctite 242 (blue) to the threads. Torque to 24 N-m (18 ft-lb).



14. Adjust the pushrod linkage as per Section 2.3.14.2.
15. Insert the clevis pin through the clevis and rod eye. Use retaining ring pliers to install the retaining ring onto the clevis pin.
16. Reconnect the air line and install the proximity sensor.
17. If no other maintenance is required, lower the trapdoor back into the AquaDrop.
18. Turn on the air supply.
19. Perform the framing square test as per Section 4.4.7 to ensure correct adjust of the proximity sensor.
20. Replace the shroud.

# 4. Electrical

***DUE TO ELECTRICAL HAZARDS, ONLY AUTHORIZED PERSONNEL ARE PERMITTED TO PERFORM ELECTRCIAL WORK!***

## 4.1. *"PCC1" Panel*

The "PCC1" panel is the main power center for the slide. Supply voltage from the site is fed into the panel and 24 VDC is output from the power supply and is fed to the "RCC1" panel. The power supply has a manual switch and is suitable for 100-250 VAC, 50-60 Hz input. The panel also features a battery backup unit to temporarily supply power to the slide in the event of a power outage.

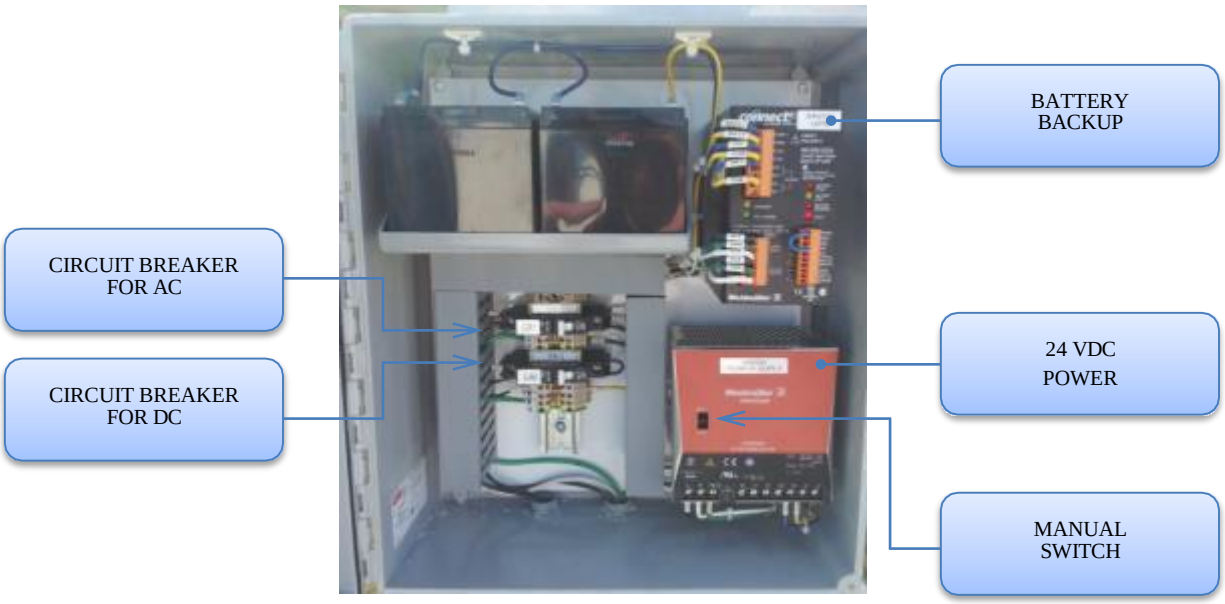



Figure 36: "PCC1" Panel

## 4.2. *"RCC1" Panel*

The "RCC1" panel is the primary slide control console for the operator and is located on

the tower near the entry to the launch capsule. This panel features the main power key switch, trapdoor and entry door control pushbuttons, an alarm indicator lamp, and an emergency stop pushbutton. There is also a window to view the error codes displayed on the PLC, as well as a lamacoid label to describe each of the error codes.




Figure 37: "RCC1" Panel

### 4.2.1. Removing the Operations Key

It is an important safety measure to remove the Operations Key prior to performing any maintenance activities on the slide. This section will describe how to remove the Operations Key from the "RCC1" panel.

| *Maintenance Procedure:* | *Removing the Operations Key* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Go to the "RCC1" panel and turn the key counterclockwise.<br>2. Remove the key and store in a safe place while performing maintenance.<br>3. Return the key to the "RCC1" panel after the maintenance is complete if slide operations are to continue, otherwise store the Operations Key in a safe<br>place until slide operations commence. |

### 4.2.2. Turning the Slide ON

The slide is turned on by inserting the Operations Key into the key switch on the "RCC1" panel and turning it clockwise.

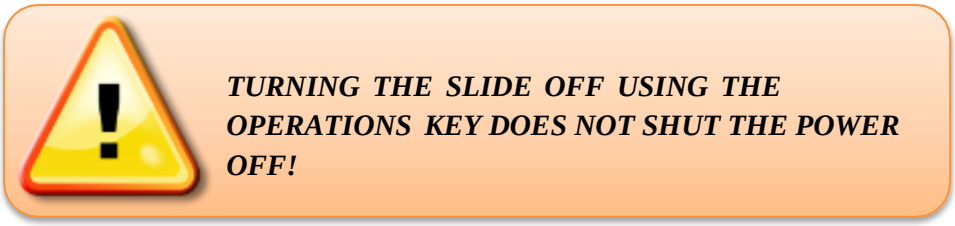
| *Maintenance Procedure:* | *Turning the Slide ON* |
|---|---|

| | |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Go to the “RCC1” panel and insert the Operations Key into the key switch. |

| | |
|---|---|
| | 2. Turn the key clockwise.<br>3. The screen on the PLC will display a UE code. If you cannot see anything on the PLC, check the breakers in both the “PCC1” and “RCC1” |

### 4.2.3. Turning the Slide OFF

At the end of the day the slide is shut down by turning the Operations Key in the “RCC1” panel counterclockwise and removing it from the panel. Store the Operations Key in a safe place. The power to the “RCC1” panel will remain ON but the slide cannot be operated without the operations key.



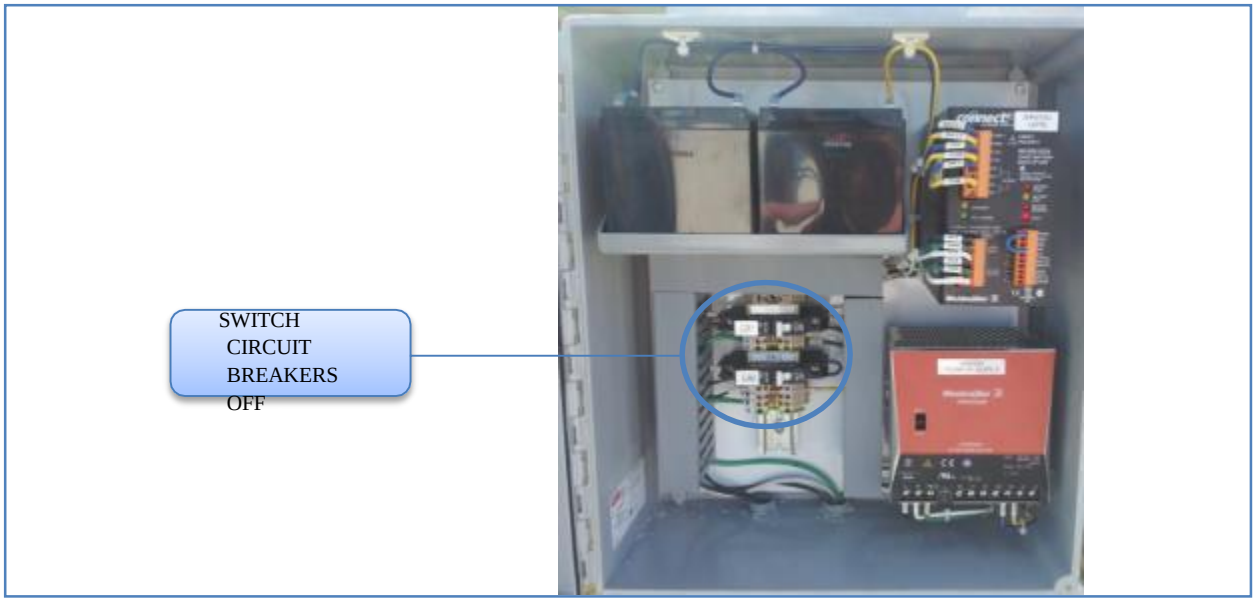
***TURNING THE SLIDE OFF USING THE OPERATIONS KEY DOES NOT SHUT THE POWER OFF!***

| *Maintenance Procedure:* | *Turning the Slide OFF* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Go to the “RCC1” panel and turn the key counterclockwise.<br>2. Remove the Operations Key from the “RCC1” panel as per Section 4.2.1.<br>3. Store the Operations Key in a safe place. |

### 4.2.4. Turning Power OFF to Slide

When performing certain maintenance activities it may be necessary to turn off power and de-energize the panel and various field devices. This section will describe how to turn off the power.

| *Maintenance Procedure:* | *Turning the Power OFF* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Due to electrical hazards, only qualified maintenance personnel are authorized to perform this procedure.<br>2. Locate the “PCC1” panel, which is typically mounted near the base of the tower.<br>3. Open the “PCC1” panel and switch the two breakers to the OFF position. This will turn off the power to the “RCC1” panel and all field devices. |




### 4.2.5. Cycling Power to the PLC

Some faults cannot be cleared without cycling power to the PLC. This section will describe how to cycle the power to the PLC.

| *Maintenance Procedure:* | *Cycling Power to the PLC* |
|---|---|
| Equipment: | - |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Go to the “RCC1” panel and turn the key counterclockwise.<br>2. Press and hold the “CLEAR” and “LAUNCH 2” pushbuttons simultaneously for one second and then release. The lights on the PLC should turn off and then back on. |



## 4.3. *Speaker*

The speaker provides an audible countdown of “3-2-1”, once the launch buttons have been pressed. The speaker is located inside the launch capsule on the top shelf. Over time, the speaker may stop working and need to be replaced. This section will describe how to replace the speaker.

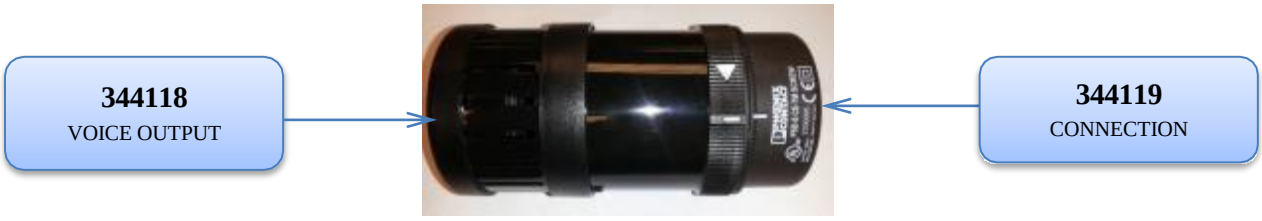
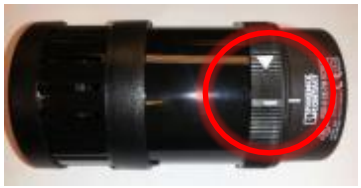



Figure 38: Speaker

| *Maintenance Procedure:* | *Replacing the Speaker* |
|---|---|
| Equipment: | - |
| Materials: | 344118-OUTPUT ELEMENT, SPEAKER |
| Frequency: | As required |
| Procedure: | 1. Disengage the entry door as per Section 2.4.3.<br>2. Remove the access panel within the launch capsule at the top.<br>3. Rotate the voice output element counterclockwise and remove.<br>4. Replace the defective voice output element with the new one. Line up the white lines on both elements, push in, and rotate the voice output element clockwise to lock in place.<br>  |

### 4.4. *Trapdoor Sensors*

Proximity sensors are used in three locations within the trapdoor assembly to monitor the positon of the trapdoor; one on the rotary actuator, one on the drop cylinder, and one on the roller bar. A pressure switch is also used to detect failures of the solenoid valves used to actuate the drop cylinder. The location of these devices is shown below.

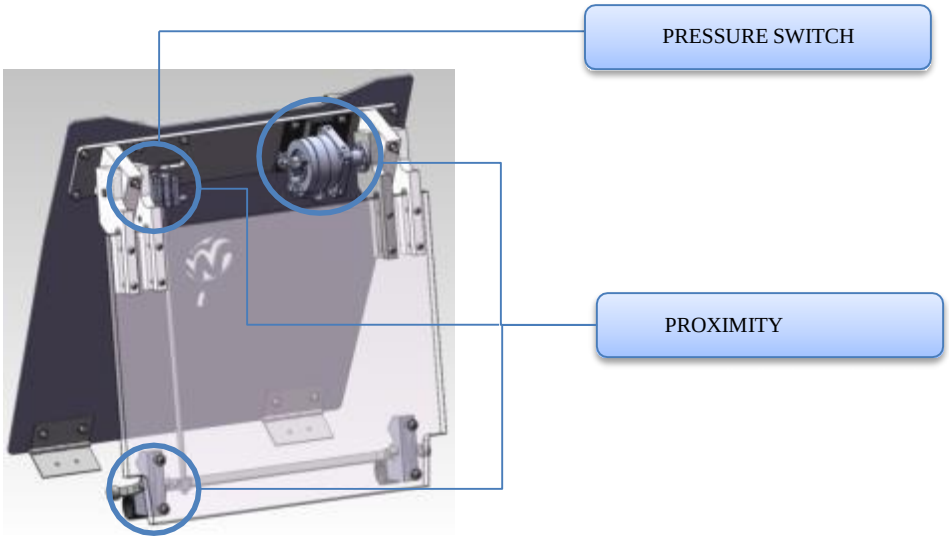



**Figure 39: Trapdoor Sensor Locations**

### 4.4.1. Adjusting Rotary Actuator Proximity Sensor

When the trapdoor is in the closed position, the proximity sensor located on the stopper should be lit. If it is not lit, then it may need to be adjusted. This section will describe how to adjust the position of the proximity sensor on the rotary actuator.

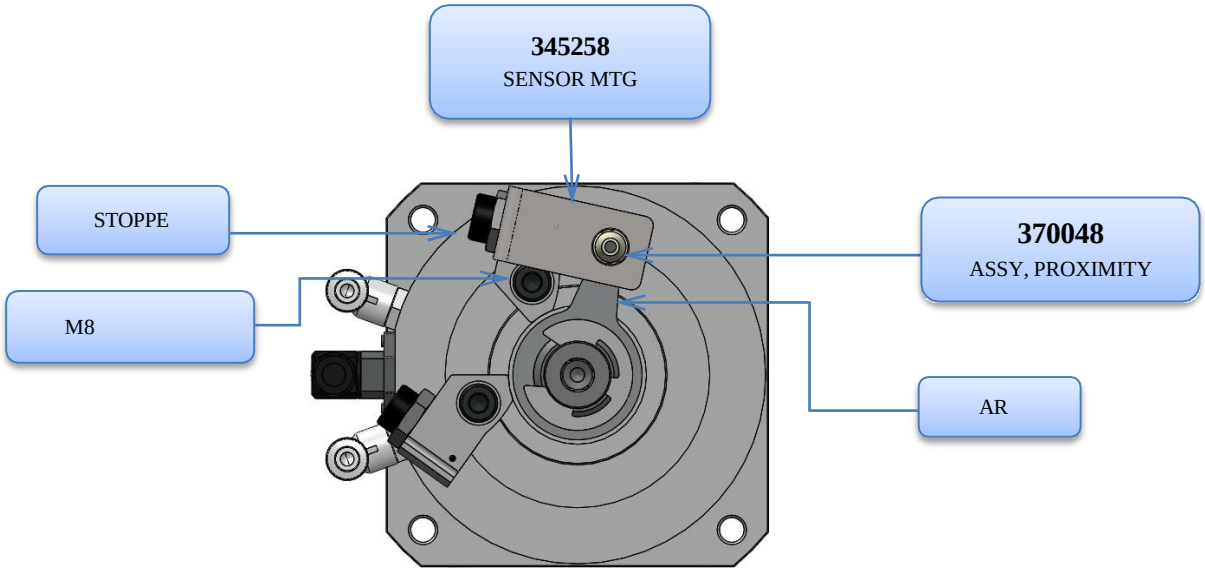



Figure 40: Rotary Actuator Details

| *Maintenance Procedure:* | *Adjusting Rotary Actuator Proximity Sensor* |
|---|---|
| Equipment: | 6mm hex Allen key<br>Adjustable wrench |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. The trapdoor must be in the closed and locked position.<br>2. Remove the Operations Key from the “RCC1” panel as per Section 4.2.1.<br>3. Turn off the air supply as per Section **Error! Reference source not found.** Follow proper LOTO procedures.<br>4. Disengage the entry door as per Section 2.4.3 and open the entry door.<br>5. Reach between the top of the trapdoor and the door jamb and loosen the M8 cap screw on the rotary actuator.<br>6. Rotate the sensor mount/stopper until the sensor is activated, i.e. LED is lit.<br>7. Tighten the M8 cap screw.<br>8. If the sensor light will still not turn on it may be too far away from the face of the arm.<br>9. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>10. Use wrenches to loosen the nuts on the body of |

the cylinder and move the sensor towards the arm such that

| | |
|---|---|
| | the face is 1-2 mm (1/32”-1/16”) from the face of the arm. |

### 4.4.2. Replacing Rotary Actuator Proximity Sensor

If adjusting the sensor does not fix the problem, it may be necessary to replace the sensor. This section will describe how to replace the sensor.

| *Maintenance Procedure:* | *Replacing Rotary Actuator Proximity Sensor* |
|---|---|
| Equipment: | Metric wrenches |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Disconnect the end of the sensor cable from the distribution box.<br>4. Use the wrenches to loosen the nuts that secure the sensor to the mounting bracket and remove the sensor.<br>5. Replace the defective sensor with a new one.<br>6. Adjust the sensor position as per Section 4.4.1 |

### 4.4.3. Adjusting Drop Cylinder Proximity Sensor

When the trapdoor is in the closed position, the proximity sensor located on the drop cylinder should be lit. If it is not lit, then it may need to be adjusted. This section will describe how to adjust the position of the proximity sensor on the drop cylinder.

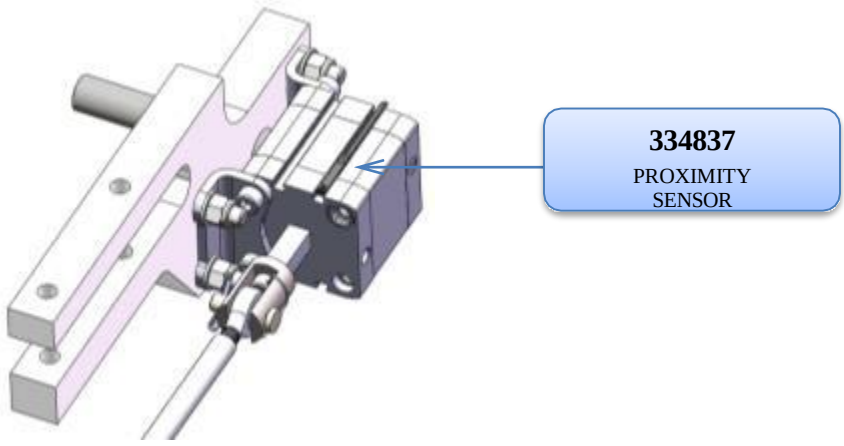



Figure 41: Drop Cylinder Details

| *Maintenance Procedure:* | *Adjusting Drop Cylinder Proximity Sensor* |
|---|---|
| Equipment: | Small hex Allen key<br>Framing square |
| Materials: | - |
| Frequency: | As required |

| | |
|---|---|
| Procedure: | 1. Remove the shroud as per Section 2.1. |

| | |
|---|---|
| | 2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Ensure the roller bar is fully out at its rest position with the drop cylinder extended, and that nothing is impeding the free movement of the roller bar.<br>4. Ensure the drop cylinder sensor is electrically connected, and the control system is on, but inactive, i.e. the Operations Key is removed.<br>5. Starting at the rear (far end from piston rod), slide the proximity sensor forward (towards the piston rod) until the amber light goes on. Continue moving the sensor forward until the light goes out. Move the sensor approximately 1mm (1/32") back, and lightly tighten the set screw.<br>6. Replace the trapdoor inside the ride as per Section 2.3.3.<br>7. Close the trapdoor in the usual fashion. Ensure |

### 4.4.4. Replacing Drop Cylinder Proximity Sensor

If adjusting the drop cylinder sensor does not fix the problem then it may be necessary to replace the sensor.

| *Maintenance Procedure:* | *Replacing Drop Cylinder Proximity Sensor* |
|---|---|
| Equipment: | Small hex Allen key |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Disconnect the end of the sensor cable from the distribution box.<br>4. Use the Allen key to loosen the screw on the sensor and slide sensor out of channel.<br>5. Replace the defective sensor with a new one.<br>6. Adjust the sensor position as per Section 4.4.3. |

### 4.4.5. Adjusting Roller Bar Proximity Sensor

When the trapdoor is in the closed position, the proximity sensor for the roller bar should be lit. If it's not lit, then it may need to be adjusted. This section will describe how to adjust the position of the proximity sensor for the roller bar.

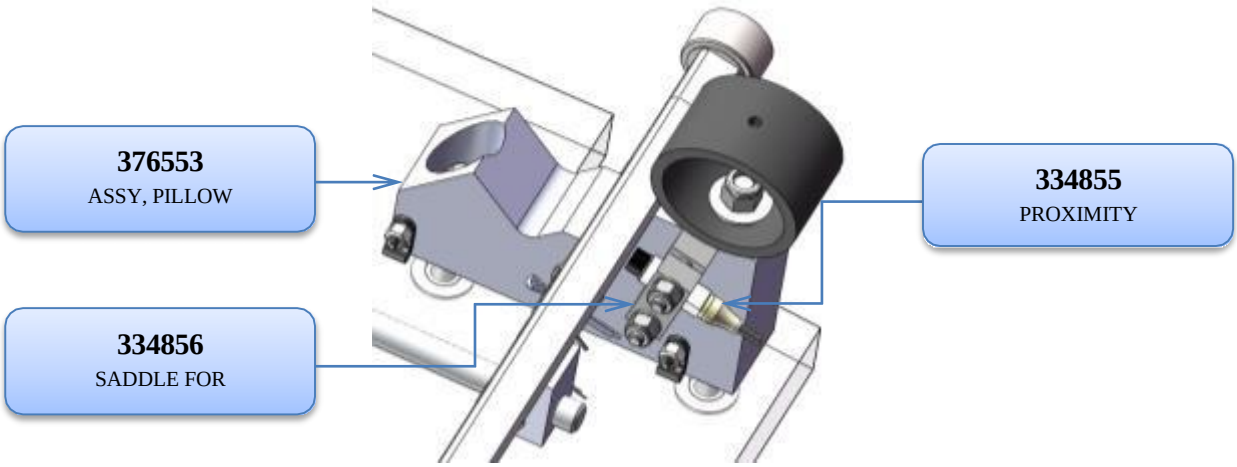
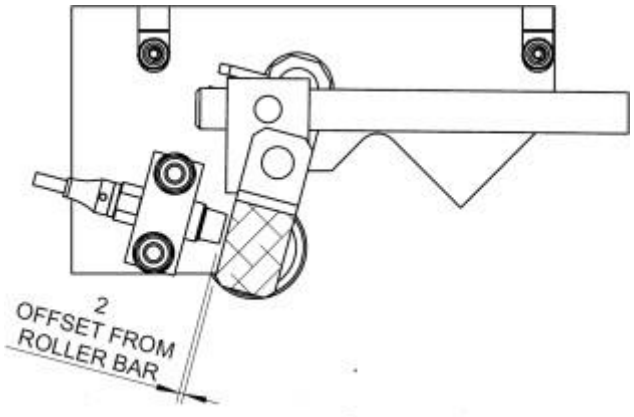



Figure 42: Rotary Actuator Details

| *Maintenance Procedure:* | *Adjusting Roller Bar Proximity Sensor* |
|---|---|
| Equipment: | Imperial wrenches |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Ensure the roller bar is fully out at its rest position with the drop cylinder extended, and that nothing is impeding the free movement of the roller bar.<br>4. Ensure the roller bar sensor is electrically connected, and the control system is on, but inactive, i.e. the Operations Key is removed.<br>5. Loosen the two bolts that fasten the sensor saddle to the pillow block.<br>6. Move the sensor until it is 2 mm (1/16”) offset from the face of the roller bar in the locked position. Ensure that the light on the sensor is lit.<br>  |

| | |
|---|---|
| | 7. Tighten the two bolts that fasten the sensor saddle to the pillow block.<br>8. Replace the trapdoor inside the ride as per Section 2.3.3.<br>9. Close the trapdoor in the usual fashion. Ensure the light on the roller bar proximity sensor is lit. |

### 4.4.6. Replacing Roller Bar Proximity Sensor

If adjusting the roller bar sensor does not fix the problem then it may be necessary to replace the sensor.

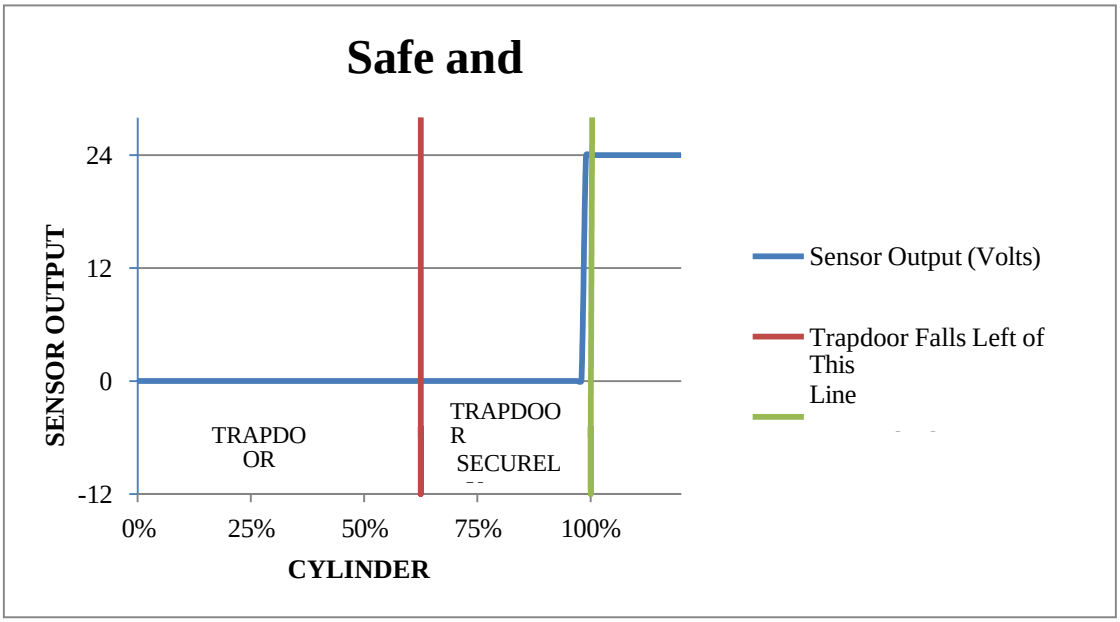
| *Maintenance Procedure:* | *Replacing Roller Bar Proximity Sensor* |
|---|---|
| Equipment: | Imperial wrenches |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Disconnect the end of the sensor cable from the distribution box.<br>4. Loosen the two screws on the sensor saddle and remove the defective sensor.<br>5. Connect the field connector to the new sensor.<br>6. Replace the defective sensor with a new one.<br>7. Adjust the sensor position as per Section 4.4.5. |

### 4.4.7. Framing Square Test

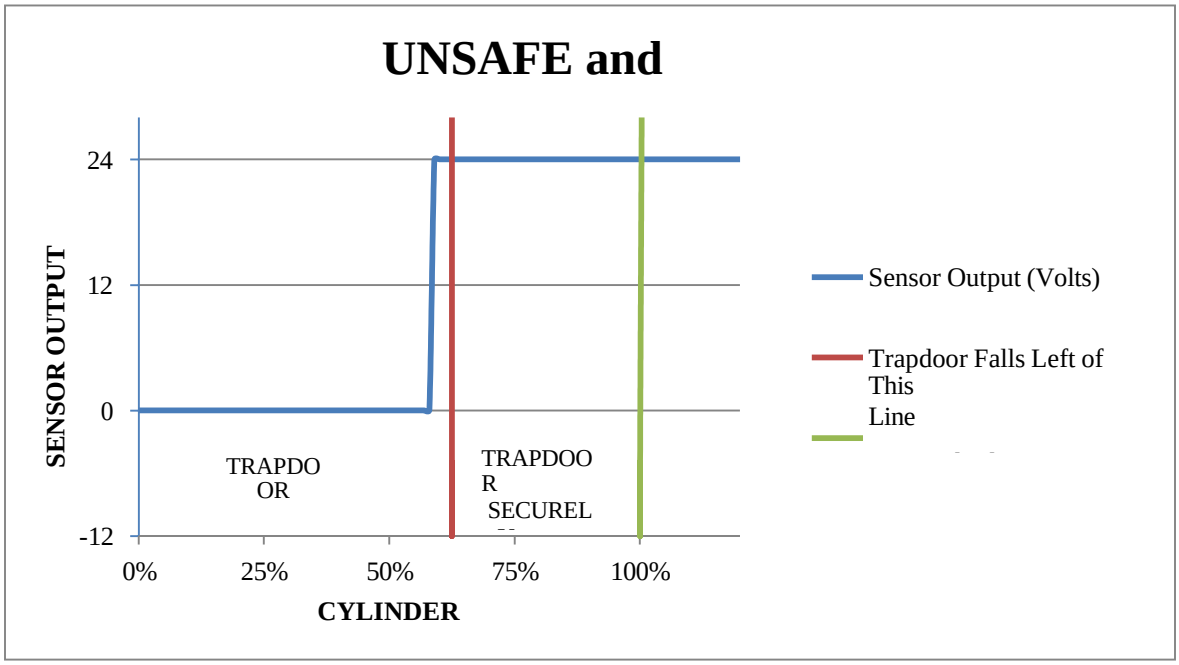
Proper positioning of the drop cylinder sensor and roller bar sensor is critical to both the SAFETY and the RELIABILITY of the AquaDrop ride.

The following graphics illustrate the relationship between the sensor range, the safety, and the reliability of the system.

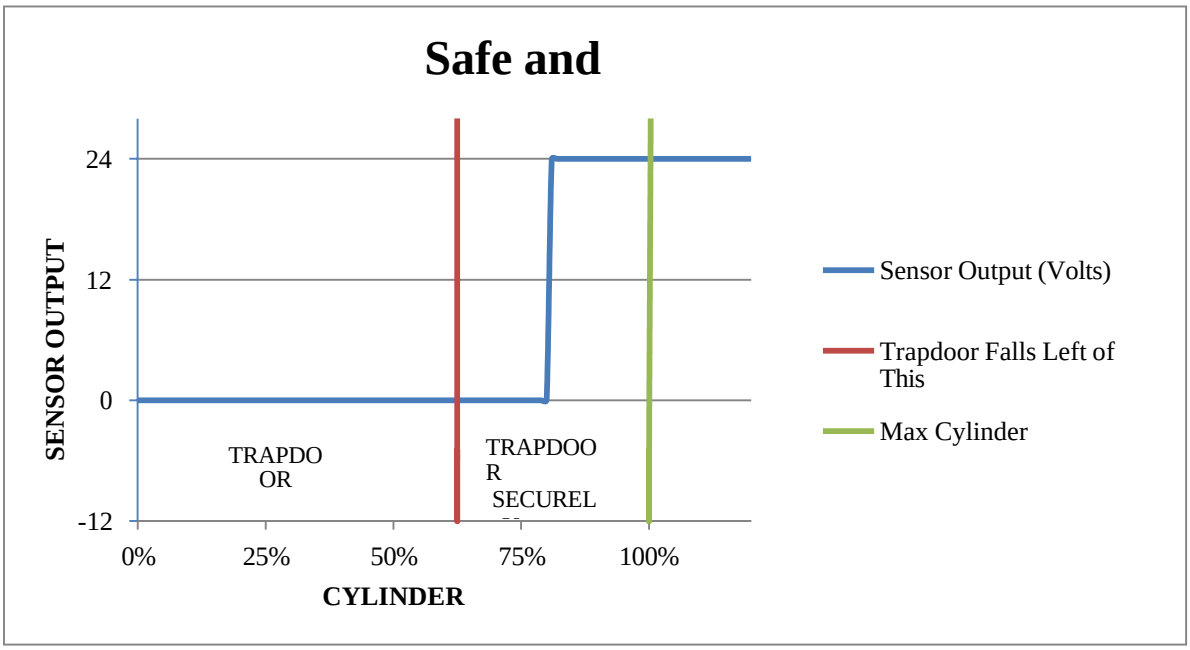
If the drop cylinder sensor is placed too far forward on the cylinder (towards the piston rod) the ride will be UNRELIABLE but safe.




If the drop cylinder sensor is placed on the cylinder too far back (away from the piston rod) the ride will be UNSAFE, but reliable.




Obviously, proper adjustment is such that UNRELIABILITY is risked, rather than risking the ride becoming UNSAFE. This means that as the drop cylinder retracts or is compressed, the drop cylinder sensor must positively turn off (output 0V) prior to the trapdoor being unable to support a rider.




When the trapdoor is in the closed and locked position, both the drop cylinder sensor and the roller bar sensor should be lit. The following procedure will describe how to confirm that both the drop cylinder sensor and the roller bar sensor are in the proper positions.

| ***Maintenance Procedure:*** | ***Framing Square Test– Test to Determine Proper Positioning of Drop Cylinder Sensor and Roller Bar Sensor*** |
|---|---|
| Equipment: | Framing square<br>Sensor Allen key |
| Materials: | - |
| Frequency: | Weekly and every time sensors are serviced, adjusted or replaced |
| Procedure: | 1. Start with the trapdoor up (closed) and the entry door open.<br>2. Remove the Operations Key from the “RCC1” panel as per Section 4.2.1.<br>3. Turn off the air supply as per Section 3.1.4. Follow proper LOTO procedures.<br>4. Secure all personnel present against falling, in accordance with local workplace safety regulation.<br>5. Secure a 22 kg (50 lb.) load to the tie off anchors on the top of the launch and have it rest on the trapdoor for the duration of this test.<br>6. Duck down and observe the amber lights on the drop cylinder sensor and the roller bar sensor. Amber light “ON” means the switch is in the “closed” state, outputting 24V.<br>7. Insert the short arm of a framing square between the roller bar and the sliding surface. |

8. Gently lever the long arm of the framing square up in a slow and controlled fashion, being careful not to move the roller bar so far that the trapdoor drops/opens.
9. Continuously observe the amber lights on the drop cylinder sensor and the roller bar sensor.
10. The amber lights on the drop cylinder sensor and the roller bar sensor must go OFF and the sensor output must be 0V while the trapdoor is still firmly locked in the closed position while under load.
11. Release the pressure on the framing square and observe the roller bar. It must slip back into the fully engaged position, and the amber lights must go ON.
12. Repeat the test ten times. Ensure there is generous margin after the lights go out and before the trapdoor drops. The drop cylinder

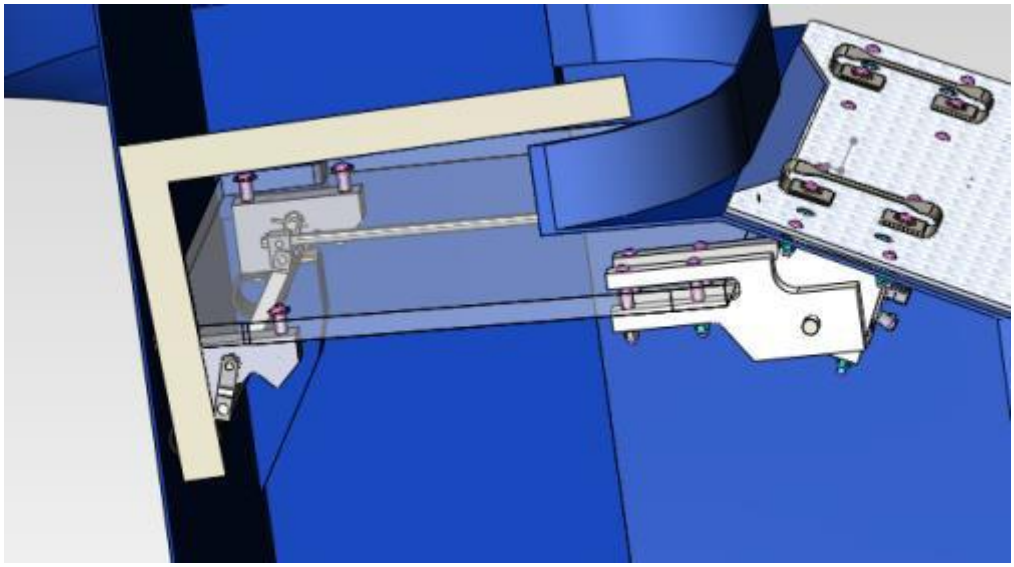


**Figure 43: Section View Showing Framing Square being used as a Lever to Push the Roller Bar away from Sliding Surface**

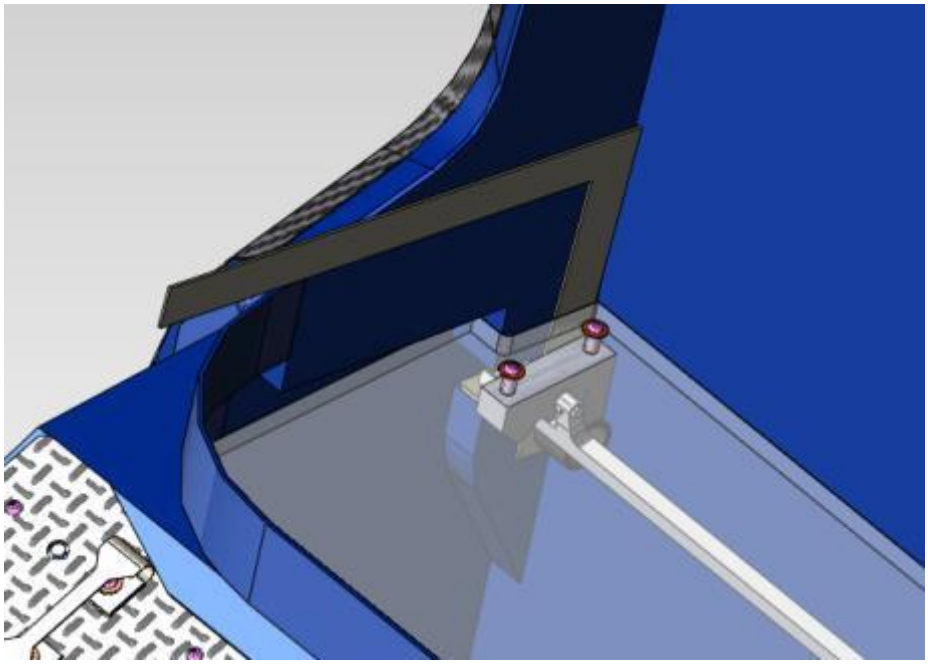


Figure 44: Another View showing Framing Square being used as a Lever to Push the Roller Bar away from Sliding Surface

### 4.4.8. Pressure Switch for Valve Failure Detection

A pressure switch is located between the two solenoid valves (V_DROP1 and V_DROP2) which release the trapdoor during the launch sequence. This pressure switch is integrated into the safety system to trigger a fault when failure of either of the two valves is detected.

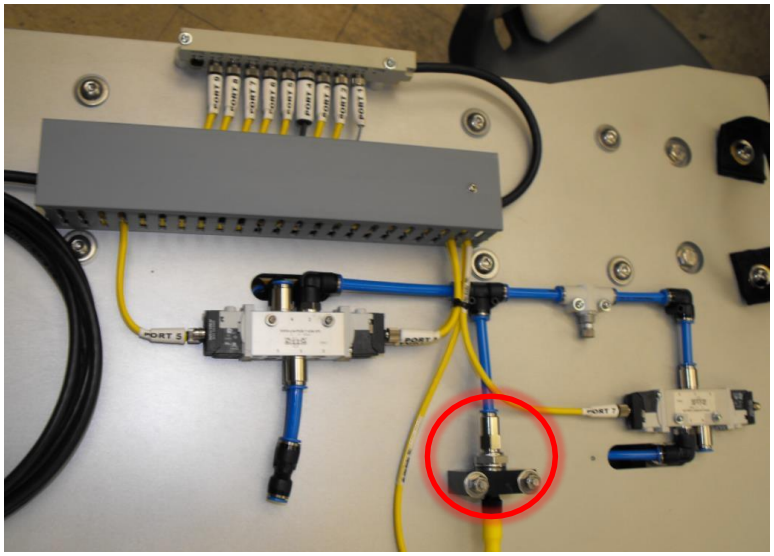


Figure 45: Trapdoor Assembly-Pneumatic Components

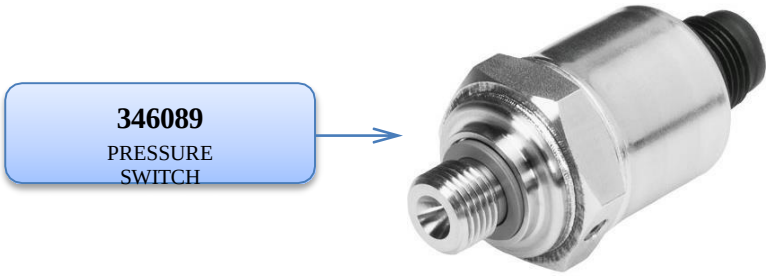



Figure 46: Pressure Switch

Failure of the pressure switch will require it to be replaced immediately. This section will describe how to replace the pressure switch.

| *Maintenance Procedure:* | *Replacing the Pressure Switch* |
|---|---|
| Equipment: | Wrenches |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Remove the shroud as per Section 2.1.<br>2. Turn off the air supply as per Section 3.1.4.<br>3. Disconnect the air line from the pressure switch.<br>4. Disconnect the electrical cable from the pressure switch.<br>5. Remove the defective pressure switch and replace it with the new one.<br>6. Reconnect the air line and electrical cable to the pressure switch. |

# 5. Water

## 5.1. *Sprayer Nozzles (Flatline Loop Only)*

The sprayer system is a critical component of the Flatline Loop ride. The maintenance procedures outlined below must be followed to ensure safe operation of the ride.

### 5.1.1. Routine Visual Inspection and Cleaning of Sprayer Nozzles

The sprayer system must be cleaned and visually inspected daily to ensure all spray nozzles are delivering adequate water flow.

| ***Maintenance Procedure:*** | ***Routine Visual Inspection of Sprayers*** |
|---|---|
| Equipment: | Small screwdriver |
| Materials: | - |
| Frequency: | Daily |
| Procedure: | 1. Clean the Y-strainer on the water line for the sprayers.<br>2. Prepare the trapdoor for maintenance as per Section 2.3.2.<br>3. Disengage the entry door for maintenance as per Section 2.4.3.<br>4. Secure a climbing rope safely to the hooks on top of the AquaLaunch.<br>5. Using a climbing harness, as per local OHSA regulations, descend down the slide from the launch opening.<br>6. Once in position at the first sprayer, have another staff member turn the water on. *Yes, you will get wet*.<br>7. Visually inspect all sprayers to ensure correct operation.<br>8. Use a small screwdriver to remove any debris lodged in the nozzles. |

## 5.2. *Paddle Flow Switches*

As part of the safety system, the AquaDrop is equipped with two flow switches to monitor the water flow. One of the flow switches is located behind the back panel of the AquaDrop on the water line which feeds the Entry Capsule, and another flow switch is located on the water line which feeds the injectors just below the capsule.

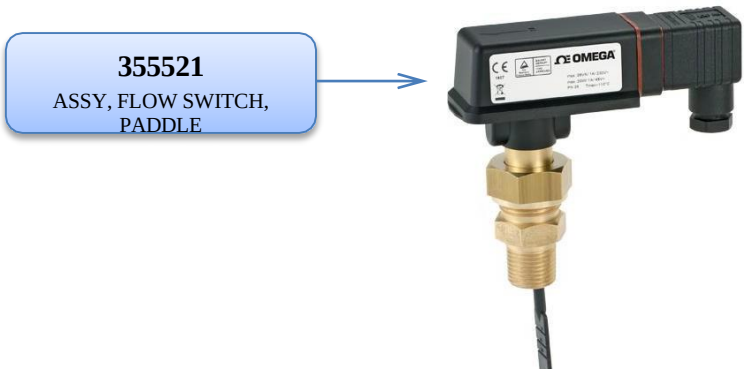



Figure 47: Paddle Flow Switch

These flow switches may become stuck in the on or off position due to debris in the lines, or they may fail completely. This section will describe how to inspect and replace the flow switches.

| *Maintenance Procedure:* | *Inspection and Replacement of Flow Switches* |
|---|---|
| Equipment: | Wrench and screw driver |
| Materials: | - |
| Frequency: | As required |
| Procedure: | 1. Turn off the water.<br>2. If applicable, remove the back panel as per Section 2.2.<br>3. Unscrew the flow switch and check the paddle for debris, and remove the debris from the paddle if necessary.<br>4. Confirm that the flow switch is functioning correctly by checking the corresponding input on the PLC within the “RCC1” panel. The input on the PLC should cycle on and off as the paddle is cycled back and forth.<br>5. If the flow switch is functioning correctly, reinstall the flow switch.<br>6. If the flow switch is not functioning correctly, replace it<br>with a new one. |

## 6. Preventative Maintenance

The following list outlines the various maintenance tasks required to safely and reliably operate your waterslide.

| Task | Daily | Weekly | Monthly | Yearly |
|---|---|---|---|---|
| **Clean trapdoor panel** *(Section 2.3.5)* | ● | | | |
| **Inspect trapdoor panel** *(Section 2.3.4)* | ● | | | |
| **Inspect rollers** *(Section 2.3.7.1)* | ● | | | |
| **Inspect retaining rings** *(Section 2.3.9)* | ● | | | |
| **Inspect roller plates** *(Section 2.3.10)* | ● | | | |
| **Inspect traps** *(Section 2.3.11)* | ● | | | |
| **Inspect rubber coupler** *(2.3.13)* | ● | | | |
| **Inspect entry door** *(Section 2.4.1)* | ● | | | |
| **Clean entry door** *(Section 2.4.2)* | ● | | | |
| **Inspect sprayers** *(Section 5.1.1)* | ● | | | |
| **Inspect slide surface for chips, cracks and defects** | ● | | | |
| **Inspect metallic components for corrosion and excessive wear** | | ● | | |
| **Inspect bumpers** *(Section 2.3.8.1)* | | ● | | |
| **Inspect trapdoor hinges** *(Section 2.3.12)* | | ● | | |
| **Inspect entry door hinge** *(Section 2.4.5)* | | ● | | |
| **Inspect pushrod linkage** *(Section 2.3.14.1)* | | ● | | |
| **Perform "Framing Square Test" on trapdoor sensors** *(Section 4.4.7)* | | ● | | |
| **Inspect pneumatic tubing for air leaks** | | | ● | |
| **Inspect electrical cables for abrasion and excess strain** | | | ● | |
| **Inspect electrical connectors for corrosion and water ingress** | | | ● | |
| **Perform dye penetrant testing on roller bar** *(Section 2.3.6)* | | | | ● |
| **Replace rollers** *(Section 2.3.7.2)* | | | | ● |
| **Replace bumpers** *(Section 2.3.8.2)* | | | | ● |
| **Replace solenoid valves** *(Section 3.2.1)* | | | | ● |
| **Replace filter cartridge** *(Section 3.1.6)* | | | | ● |

## 6.1. *End of Season Maintenance*

The following is a list of recommended tasks to be performed at the end of the operating season.

- Remove the trapdoor assembly from the slide and store in a warm and dry location.
- Cover the “RCC1” and multi-launch (if applicable) console to protect them from weather. You do not have to remove the cables connected to the base of the panel(s) as long as they are covered, but if you do, wrap the ends of the cables to protect them.
- Follow the manufacturer’s recommendations for proper maintenance of the battery backup unit.

# 7. Troubleshooting



***NEVER BYPASS ANY PART OF THE SAFETY SYSTEM (SENSORS, FLOW SWITCHES, ETC.)***

## 7.1. *Fault Codes*

The table shown below is a list of fault codes that you will see during operation of the AquaDrop slide. The following sections will describe each of the fault codes and the steps required to resolve them.

| UE CODE | DESCRIPTION |
|---|---|
| **00** | Ready |
| **07** | Water low |
| **11** | System water needs cycle |
| **22** | Trapdoor sensor fault |
| **23** | V_DROP1 valve fault or pressure switch fault |
| **32** | V_DROP2 valve fault |
| **33** | System initialization |
| **53** | E-stop is pressed |
| **88** | Slide occupied |

## 7.2. *Common Problems*

The following list describes typical problems that may arise during operation of the slide and a list of potential solutions to each.

| Problem | Solution |
|---|---|
| Entry door won't open | • If you have a Multi-Launch console, check that override switch is turned OFF.<br>• Check proximity sensors on rotary actuator, drop cylinder, and roller bar. These should all be lit when the door is closed. If they're not lit, then they may need to be adjusted or replaced.<br>• Check that "JBDOOR" switch is in the ON position.<br>• Check that the release pin is connected to the linear actuator and linkage assembly |
| No Sound | • Check that the voice output element is properly connected to the voice output connection element.<br>• The voice output element may need to be replaced. |
| Trapdoor does not drop for heavy riders | • Check the rollers for corrosion.<br>• Check the unit air pressure.<br>• Check flow control valve setting.<br>• Ensure there isn't water in the air lines. |
| Trapdoor does not latch in place after launching a rider | • Check unit air pressure.<br>• Ensure trapdoor clamps are engaged.<br>• Ensure there isn't water in the air lines.<br>• Confirm solenoid valve for rotary actuator is functional. |
| Cannot launch rider when door is closed and slide is clear | • Check that the light on the safety switch is green when the door is closed. If not, adjust the position of the switch and actuator until the light turns from red to green.<br>• Switch or actuator may need to be replaced.<br>• Faulty electrical connection. |
| Flow switches won't go low after water is shut off | • Check flow switches for debris.<br>• Check electrical connections for moisture and debris.<br>• Flow switches may need to be replaced. |

### 7.3. *Fault Code "UE 00"*

Fault code "UE 00" indicates that the system is ready for operation.

When the PLC displays "UE 00" and the entry door is closed, both "LAUNCH" pushbuttons should be lit green and it is safe to launch a rider.

If the PLC displays "UE 00" but the two "LAUNCH" pushbuttons are not lit green then the system thinks that the entry door is open and won't permit a launch.

Solutions:

- If the entry door is not closed, then close it using the "DOOR CLOSE" pushbutton.
- If the entry door is already closed, there may be a problem with the door sensor or one of the electrical connections.
    - Check the alignment of the sensor and ensure that the light on the sensor is green when the door is closed. If the light is red instead of green then it may be too far from the safety switch actuator and the position may need to be adjusted.
    - The problem may also be due to a faulty sensor or connection between the sensor and the distribution box or other electrical connection.

### 7.4. *Fault Code "UE 07"*

Fault code "UE 07" indicates there is insufficient water flow at one or more of the flow switches. The safety system continuously monitors each flow switch to ensure sufficient water flow.

If the system detects insufficient water flow, a fault will be triggered and "UE 07" will be displayed on the PLC.

The slide cannot operate until the problem has been resolved. Solutions:

- Check that all pumps are turned on.
- Confirm that the basket strainer is clean.
- Identify which flow switch is causing the problem.
    - AquaDrop has two paddle style flow switches.
    - Use I/O table and look at PLC to see which one is off.
    - Flow switch may have debris in it or may need to be replaced.

### 7.5. *Fault Code "UE 11"*

Fault code "UE 11" indicates that the system water needs to be cycled.

The safety system checks each flow switch every 24 hours to confirm that it has

changed state from ON to OFF. This check confirms that each flow switch is functioning properly. Without this check, if a flow

switch failed in the ON position then the system would think the water is ON even when the water is OFF. This is not safe!

Normal daily operations where water is turned on in the morning and turned off in the evening is sufficient to satisfy this requirement.

If the system detects that one or more flow switches have not changed state, then "UE 11" will be displayed on the PLC.

The slide cannot operate until the problem has been

resolved. Solutions:

- With all pumps ON, confirm that all flow switch inputs on the PLC are ON. Refer to the I/O table.
- If any flow switches are not ON then they may need to be cleaned or replaced.
- With all pumps OFF, confirm that all flow switch inputs on the PLC are OFF. Refer to I/O table.
- If any flow switches are not OFF then they may need to be cleaned or replaced.

### 7.6. *Fault Code "UE 22"*

Fault code "UE 22" indicates a trapdoor sensor fault, or anytime the system detects an incomplete launch sequence.

The safety system monitors each of the three trapdoor sensors to ensure they change state during each launch cycle. Similar to the flow switch check, this check confirms that each sensor is functioning properly.

The slide cannot operate until the problem has been

resolved. Causes:

- Faulty sensor
- Faulty solenoid valve
- Loose or faulty electrical connection

Solutions:

- Ensure all electrical connections are clean, free of moisture (dielectric grease is fine), and snug.
- All three sensor inputs on PLC should be ON when the trapdoor is up and locked. There are also lights on each sensor. If not, the sensor may be misaligned or may need to be replaced. Refer to I/O table.
- Prepare the trapdoor for maintenance. Manually push the roller bar back to retract the drop cylinder; both the roller bar sensor and the drop cylinder sensor inputs should be OFF. The rotary actuator sensor input should also be OFF. If any are ON, then the sensor may be misaligned or may need to be replaced. Refer to I/O table.
- If you replace a sensor and find that the problem is still not fixed, it could be a problem with the multi-port distribution box that connects the sensor back the "RCC1" panel.

- Example: If the sensor input on the PLC in ON when the sensor is unplugged from the distribution box, then there is likely a short circuit in the distribution box or cable.

- If all three sensors are functioning correctly but you are still getting "UE 22" then it may be a faulty solenoid valve. Observe the lights on each solenoid to confirm that they are turning ON during a launch sequence. If not, there may be a faulty electrical connection or the valve may need to be replaced.

### 7.7. *Fault Code "UE 23"*

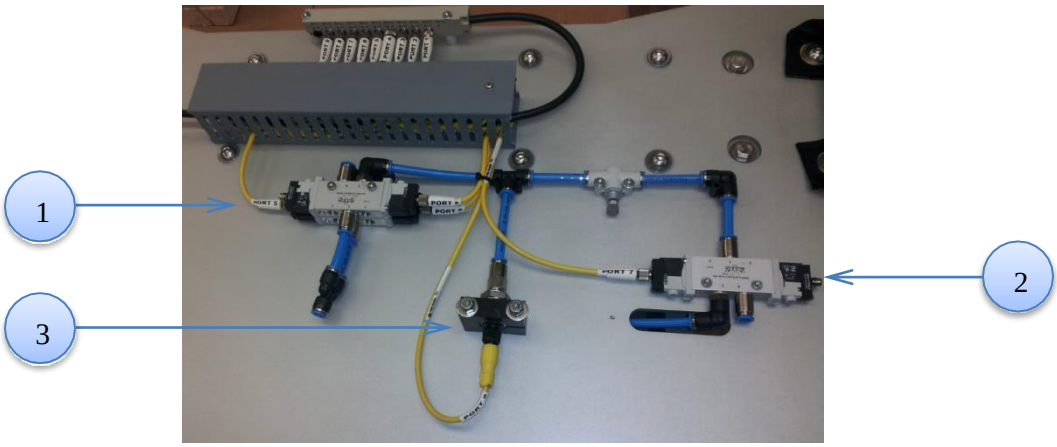
Fault code "UE 23" indicates a V_DROP1 solenoid valve fault, or a pressure sensor fault.

Two solenoid valves in series are used to actuate the drop cylinder; V_DROP1 (1) and V_DROP2 (2).

As part of the safety system, a pressure sensor (3) is located between the two valves to detect a valve failure.

V_DROP1 is energized first and then V_DROP2 is energized a 300ms later

If the pressure sensor detects pressure at any time other than during the launch sequence, "UE 23" fault will be triggered because either V_DROP1 valve has failed in the OPEN position, or the pressure sensor has failed in the ON position.




Solutions:

- With the air supply OFF, if the pressure sensor input on the PLC is lit then the pressure sensor has failed. Refer to I/O table.
- If the pressure sensor input is not lit on the PLC when the air supply is OFF, but is lit when the air supply is ON, then the valve has failed in the OPEN position and will need to be replaced. Refer to I/O table.

### 7.8. *Fault Code "UE 32"*

Fault code "UE 32" indicates a V_DROP2 solenoid valve fault.

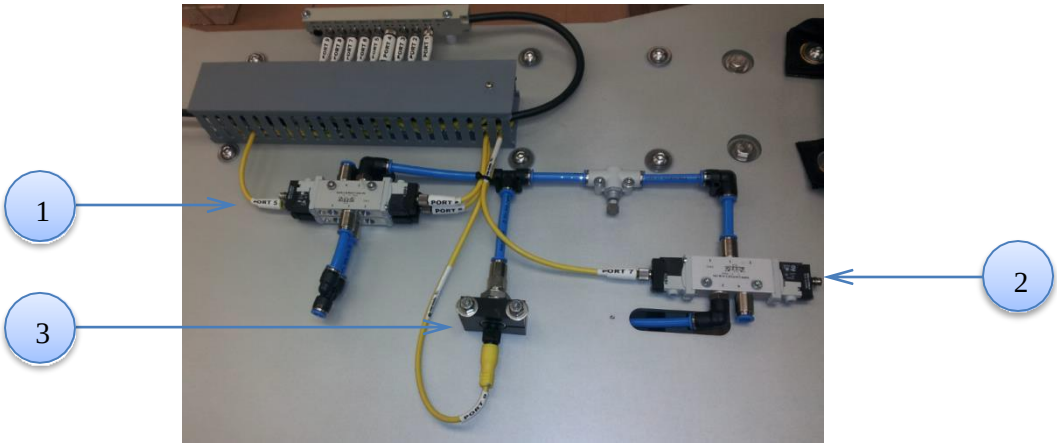
Two solenoid valves in series are used to actuate the drop cylinder; V_DROP1 (1) and V_DROP2

(2).

As part of the safety system, a pressure sensor (3) is located between the two valves to detect a valve failure.

V_DROP1 is energized first and then V_DROP2 is energized a 300ms later

If the system detects movement of the trapdoor prior to V_DROP2 being energized, then V_DROP2 has failed OPEN and “UE 32” fault will be triggered.




Solutions:

- Replace V_DROP2 valve

### 7.9. *Fault Code “UE 33”*

Fault code “UE 33” indicates that the slide needs to be “cleared” before the system can operate.

The safety system requires manual checks and acknowledgment that the slide is clear of riders or other hazards before allowing operation. Refer to the Operations Manual for instructions on how to “Clear” the slide.

If after following the slide clearing sequence the slide will not operate, there is likely a problem with one of electrical devices.

Solutions:

- Referring to the I/O table, confirm that the inputs for the “CLEAR” button at the “RCC1” panel change state when pressed.
- Referring to the I/O table, confirm that the inputs for the “CLEAR” button at the end of slide panel change state when pressed.
- If any of those devices don’t change state as they should, then there may be an electrical issue such as a loose wire, damaged cable, or water ingress. Contact electrician to resolve.

### 7.10. *Fault Code "UE 53"*

Fault code "UE 53" indicates that one of the "ESTOP" buttons is pressed.

The "ESTOP" buttons are Emergency Stop buttons that prevent the slide from operating in the event of an emergency.

Solutions:

- Release affected "ESTOP" button(s) and perform slide clearing procedure.
- There may be an electrical issue with one of the devices; such as a loose wire, damaged cable, or water ingress. Contact electrician to resolve.

### 7.11. *Fault Code "UE 88"*

Fault code "UE 88" indicates that a rider is currently within the slide.

The safety system will not allow another rider to be launched until the slide is clear.

If after following the slide clearing sequence the slide will not operate, there is likely a problem with one of electrical devices.

Solutions:

- Check electrical devices/connection for loose wires, damaged cables, or water ingress. Contact electrician to resolve.

## 8. Technical Support

If after following all of the troubleshooting steps you still cannot resolve the issue, you may contact our technical support team. WhiteWater has a qualified team of specialists available to help resolve your issue.


1-866-936-3996


AquaLoopMaintenance@whitewaterwest.com

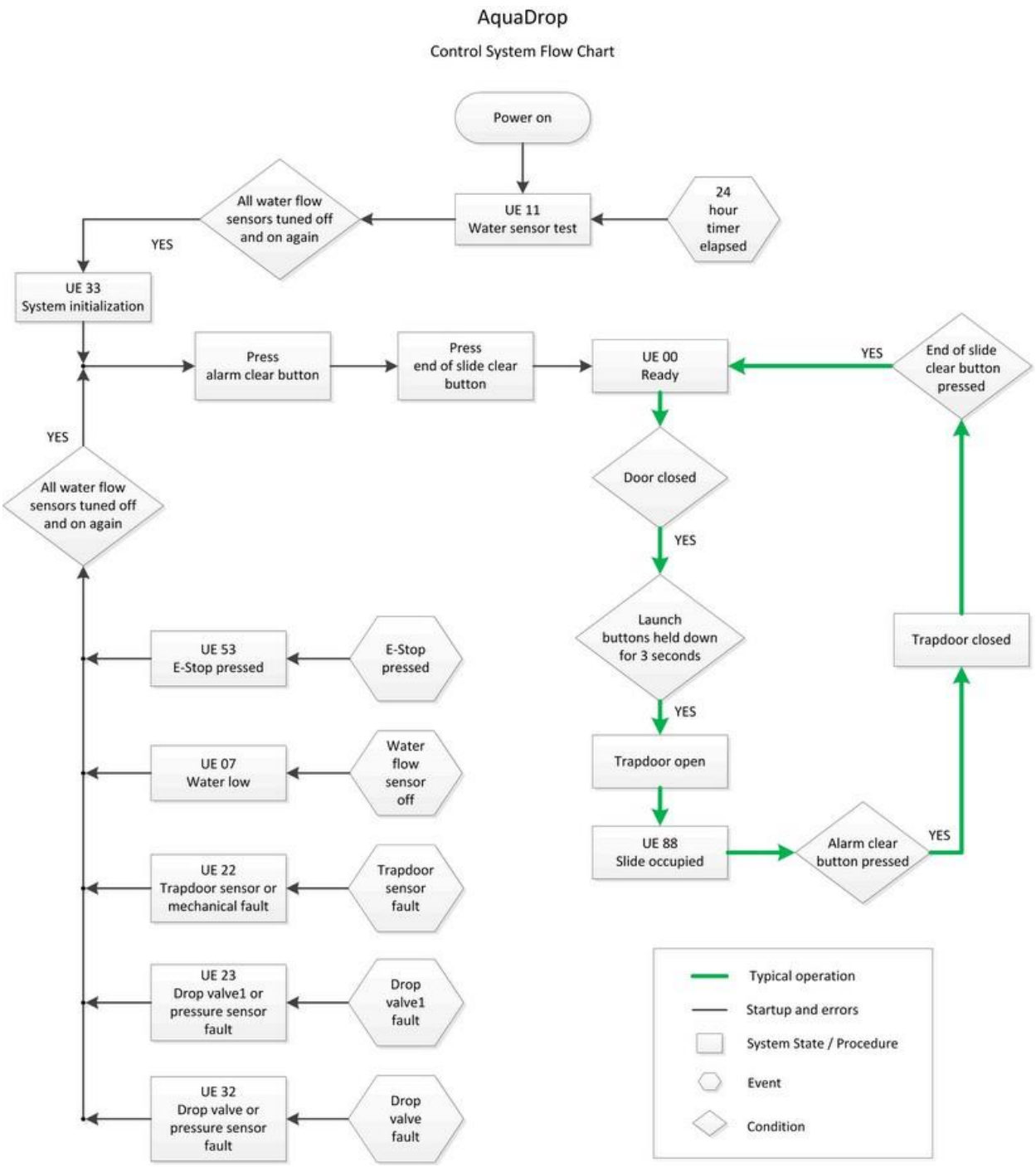
## 9. Spare Parts

Always remember to replenish your spares following any maintenance activities. You can contact WhiteWater's After Sales department or visit our After Sales & Service E-store to order parts.

http://aftersales.whitewaterwest.com

# 10. Appendix

## 10.1. *AquaDrop Flow Chart*



## 10.2. *I/O Table*

| Area | Description | Variable | Input/Output | PLC terminal |
|---|---|---|---|---|
| End of slide (EOS) | Clear button, normally open | EOSCL_NO | Input | I0 |
| End of slide (EOS) | Clear button, normally closed | EOSCL_NC | Input | I1 |
| End of slide (EOS) | ESTOP button, normally open | EOS_ESTOP1_NO | Input | I2 |
| End of slide (EOS) | ESTOP button, normally open | EOS_ESTOP2_NO | Input | I3 |
| Trapdoor | Rotary Actuator Prox, normally open | PS_UP_NO | Input | I4 |
| Trapdoor | Rotary Actuator Encoder | ENC | Input | I5 |
| Trapdoor | Roller Bar Prox, normally open | PS_D1_NO | Input | I6 |
| Trapdoor | Drop Cyl. Prox, normally open | PS_D2_NO | Input | I7 |
| Trapdoor | 5/3 Valve 3 Rotate Open | V_OP_R | Output | IQ10 |
| Trapdoor | 5/3 Valve 3 Rotate Close | V_CL_R | Output | IQ11 |
| Trapdoor | 5/3 Valve 1 Drop | V_DROP2 | Output | Q2 |
| Trapdoor | 5/3 Valve 2 Drop | V_DROP1 | Output | Q3 |
| Trapdoor | Pressure sensor to detect V_DROP valve failure | PV_1_NO | Input | IQ25 |
| Entry Door | Jokab Adam Pin4 | DOOR_NO | Input | IQ12 |
| Entry Door | Linear Actuator Black | - | - | Q4 via CR1-11 |
| Entry Door | Linear Actuator Black | DOOR_OPEN | Output | Q4 via CR1-11 |
| Entry Door | Sound Module Term. 2 | SND1 | Output | IQ13 |
| Entry Door | Jokab Adam Pin2 | Dyn. A | Output-DynA | IQ14 |
| Entry Door | Linear Actuator Red | - | - | Q5 via CR2-11 |
| Entry Door | Linear Actuator Red | DOOR_CLOSE | Output | Q5 via CR2-11 |
| RCC1 (Panel) | Rotary switch RS1, normally open | RS1_NO | Input | IQ15 |
| RCC1 (Panel) | Rotary switch RS1, normally closed | RS1_NC | Input | IQ16 |
| RCC1 (Panel) | Launch button 1, normally closed | PB1_NC_ | Input | IQ17 |
| RCC1 (Panel) | Launch button 1, normally open | PB1_NO_ | Input/Output - DynA | IQ20 |
| RCC1 (Panel) | Launch button 2, normally closed | PB2_NC_ | Input | IQ21 |
| RCC1 (Panel) | Launch button 2, normally open | PB2_NO_ | Input/Output - DynA | IQ22 |
| RCC1 (Panel) | Clear button, normally closed | PBCL_NC_ | Input | IQ23 |
| RCC1 (Panel) | Clear button, normally open | PBCL_NO_ | Input/Output - DynA | IQ24 |
| RCC1 (Panel) | Water monitor, normally open | RCC_WM1_NO | Input | IQ26 |
| RCC1 (Panel) | Water monitor, normally open | RCC_WM2_NO | Input | IQ27 |
| Multi-Launch Console (OPM) | Launch button 1, normally open | OPM_PB1_NO | Input | I44 |
| Multi-Launch Console (OPM) | Launch button 1, normally closed | OPM_PB1_NC | Input | I45 |
| Multi-Launch Console (OPM) | Launch button 2, normally open | OPM_PB2_NO | Input - DynA | I46 |
| Multi-Launch Console (OPM) | Launch button 2, normally closed | OPM_PB2_NC | Input - DynA | I47 |

## ADDENDUM: SHUTDOWN LANE FLOW TRANSITION DATA RECORDING SHEET, AQUADROP, SLIDE AE

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**FINAL MEASUREMENTS**

| | |
|---|---|
| **FLOW RATE** | 245 25 GPM |
| **DIMENSION-A (SPECIFY UNITS)** | 6.5 IN |
| **DIMENSION-B (SPECIFY UNITS)** | 87 FT. |
| **DIMENSION-C (SPECIFY UNITS)** | 2 IN |

CAUTION - HYDRAULIC LOCATION IS FOR REPRESENTATION PURPOSES ONLY. FINAL HYDRAULIC LOCATION TO BE DETERMINED DURING COMMISSIONING.

DIMENSION B

**G**

## OPERATING WATER DEPTH MEASUREMENT LOCATIONS

**H**

DIMENSION A (WATER DEPTH)

DIMENSION C (WATER DEPTH)

DIMENSION C IS THE MINIMUM DISTANCE FROM THE HYDRAULIC TRANSITION WHERE AN ACCURATE READING CAN BE TAKEN.

**DETAIL G**

MEASURE
1'-0"
300
AWAY FROM JOINT

**DETAIL H**

| REV | REVISION DESCRIPTION/ISSUE RECORD | DATE | PE |
|---|---|---|---|
| A | UPDATED WITH FINAL MEASUREMENTS | MAR 20 2018 | RS |
| 0 | RELEASED | JUN 06 2017 | CB |

| | | | |
|---|---|---|---|
| DESIGNED BY: CB | DATE: JUN 05 2017 | PROJ. ENG. CHECK: CB | DATE: JUN 06 2017 |
| DRAWN BY: SJ | DATE: JUN 06 2017 | DRAFTING CHECK: CB | DATE: JUN 06 2017 |
| SCALE: 1:60 | | ARCHIVE FILE No: | |

NOTE:- METRIC DIMENSIONS
METRIC MM
IMPERIAL [IN]

**PROJECT NAME** EMERALD GLEN AQUATIC CENTER

**PROJECT NUMBER** 31548

**SLIDE NUMBER** AE

**CERTIFIER** ANDY MULLIGAN

**348**

WHITE WATER
WhiteWater West Industries Ltd
6700 McMillan Way, Richmond, B.C. Canada V6W 1J7

| | |
|---|---|
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| | |
| | |

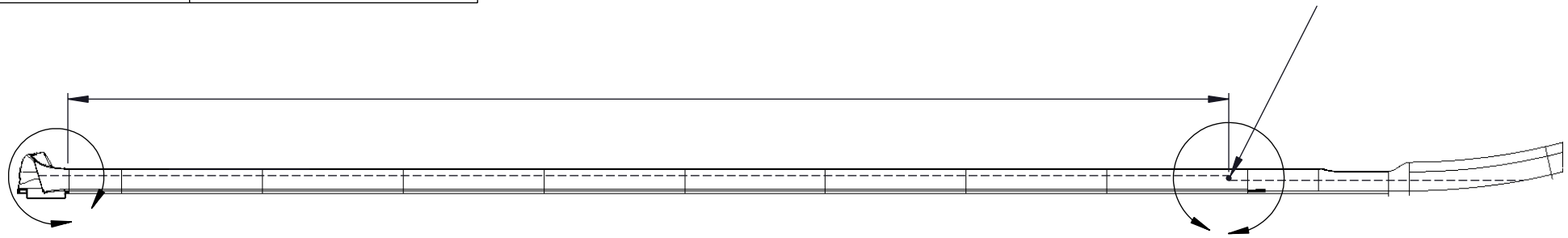
Tel (604) 273-1068 Fax (604) 273-4518

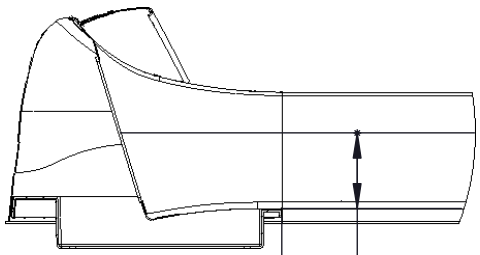
**CERTIFIER DATE** 12-MAR-2018

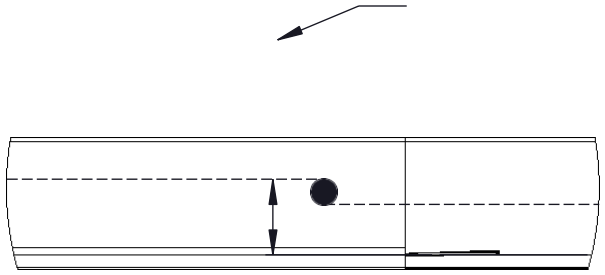
SHUTDOWN LANE FLOW TRANSITION
DATA RECORDING SHEET

EMERALD GLEN AQUATIC CENTER

| PROJECT No | DRAWING No | REVISION |
|---|---|---|
| 31548 | 31548-AE-S1270 | A |







[ ]

| | |
|---|---|
| | |
| | |
| | |
| | |

FILE : C:\Slides1\Projects\31548 Emerald Glen Aquatic Center\Documents\Shutdown Lane Drawings\31548-AE-S1270-SHUTDOWN-LANE-FLOW-TRANSITION
LAST SAVED BY : rick.sebulsky , ON Tuesday, March 20, 2018 2:13:16 PM

## ADDENDUM: PROCEDURE FOR ANNUAL OPERATIONAL TESTING OF WATERSLIDE

| PROCEDURE | | | WHITEWATER | |
|---|---|---|---|---|
| PROJECT NO. | DOCUMENT NO. | REVISION | CREATED BY | DATE |
| - | 428676 | X3 | R.S. | 2017-07-06 |
| | | | APPROVED BY | DATE |
| | | | C.B. | 2018-03-05 |
| TITLE | | | | |
| PROCEDURE FOR ANNUAL OPERATIONAL TESTING OF WATERSLIDE | | | | |

## 1.0 OBJECTIVE

The objective of this procedure is to outline the procedure for the Owner/Operator to perform annual operational testing on their slide to ensure that it's operating within its prescribed operational limits.

## 2.0 SCOPE

The scope of this document is limited to high speed body slides with shutdown lanes.

## 3.0 PROCEDURE FOR OPERATIONAL TESTING

This section will outline the procedure for the Owner/Operator to perform **annual** operational testing on their slide to ensure that it's operating within its prescribed operational limits set during commissioning.

1. Inspect the slide surface and joints for defects such as chips and cracks. Perform remedial work as necessary.

2. To ensure optimal slide performance, the slide surface must be clean and free of scale and residue. Clean and wax the slide surface, per the O&M, if the slide surface is compromised.

3. Turn on the slide pumps. Ensure valve lockout tags installed during commissioning are still in place and haven't been tampered with. Verify that all flow meters are functional and reading within the prescribed range documented within the completed "shutdown lane flow transition data recording sheet" for the given slide.

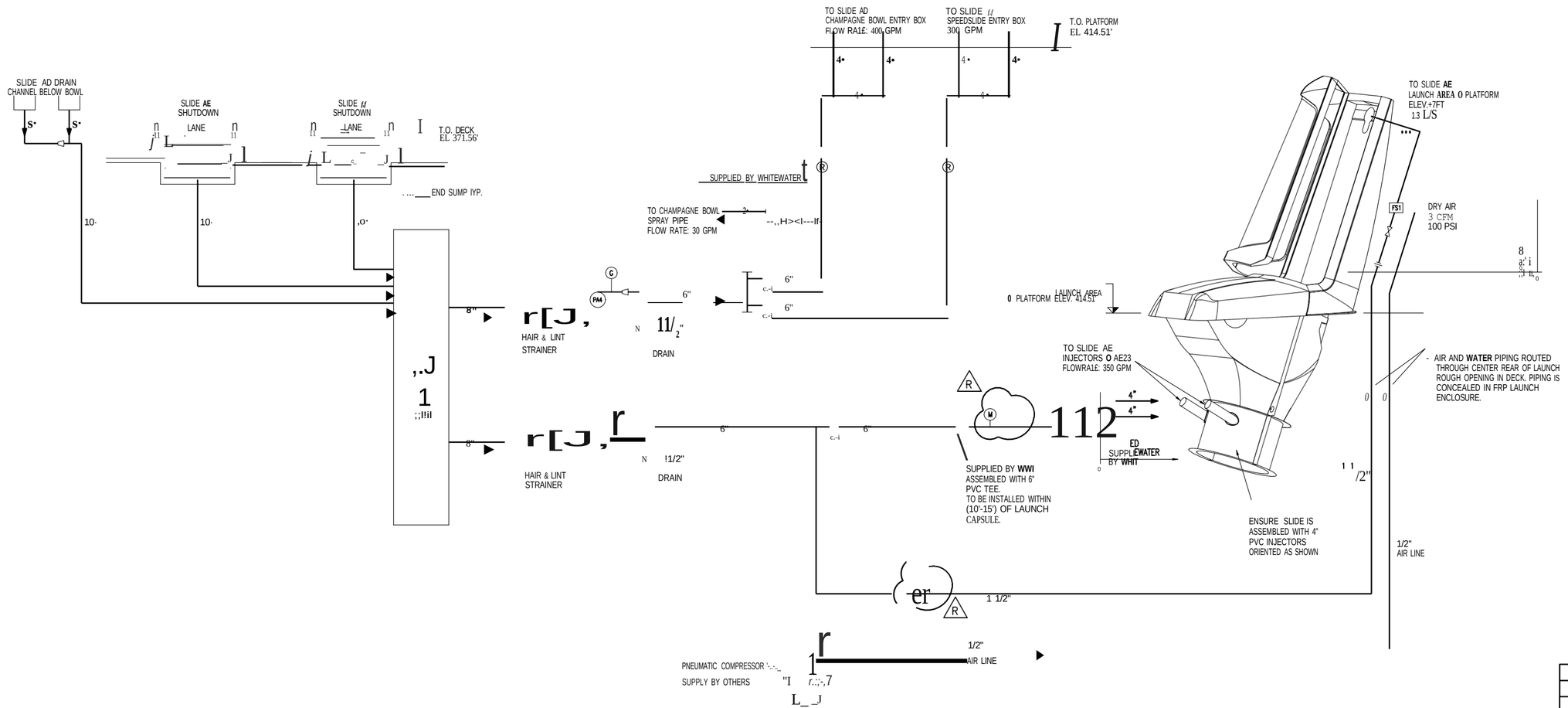
4. Inspect the shutdown lane settings. Ensure that the flow transition is approximately centered within the flow transition markers, and that the water depth at the end of the shutdown lane is at the height of the depth marker set during commissioning. Refer to the completed "shutdown lane flow transition data recording sheet" for commissioning settings.

5. Document all slide settings; including slide surface quality, flow rate, location of flow transition, weir height, and depth of water in the shutdown lane.

## 4.0 REFERENCE

Refer to the "shutdown lane flow transition data recording sheet" completed for the given slide during commissioning. This sheet provides the final, commissioned flow, depth and transition location measurements.

## ADDENDUM: MECHANICAL DRAWINGS




## SLIDE AD, AE, & AF

## ~~PUMPING FLOW DIAGRAM~~

N. T. S.

### LEGEND

| | |
|---|---|
| | CHECK VALVE |
| | BUTTERFLY VALVE |
| | BALL VALVE |
| | FLEXIBLE PIPE CONNECTOR |
| | PUMP |
| | REDUCER/ INCREASER |
| | PRESSURE/ VACUUM GAUGE |
| | FLOW METER |

### ~~PUMP DATA~~

(§

| | |
|---|---|
| FLOW RATE | 730 GPM |
| TIH | 63 FT |
| POWER | 20 HP |
| TYPE | END SUCTION CENTRIFUGAL |
| QUANTITY | 1 |

@

| | |
|---|---|
| FLOW RATE | 370 GPM |
| TIH | 70 FT |
| POWER | 10 HP |
| TYPE | END SUCTION CENTRIFUGAL |
| QUANTITY | 1 |

### ~~PNEUMATIC COMPRESSOR DATA~~

®

| | |
|---|---|
| FLOW RATE | 3 CFM |
| PRESSURE | 100 PSI |
| POWER | 3 HP |
| QUANTITY | 1 |

### ~~NOTES:~~

1. THE SCHEMATIC SHOWN ILLUSTRATES THE INTENDED FUNCTIONAL REQUIREMENTS FOR THE MECHANICAL OPERATION OF THE WATERSLIDES. LOCAL PROJECT ENGINEERS MAY DESIGN SITE-SPECIFIC SYSTEMS THAT DIFFER **FROM** THIS WITH THE RESPONSIBILITY FOR THE DESIGN RESTING WITH THE LOCAL ENGINEER.
2. PUMP PERFORMANCE, DISCHARGE PIPE SIZE & DISCHARGE BUTTERFLY VALVE ARE ESSENTIAL FOR PROPER SLIDE OPERATION.
3. PROVIDE THRUST BLOCKS OR RIGID CLAMPS AT ALL BENDS AND AS REQUIRED ALONG THE LENGTH OF SUCTION AND DISCHARGE PIPING.
4. PUMP SUCTION FLANGE SHOULD BE BELOW POOL WATER LEVEL
5. PIPE HAS TO BE RIGIDLY CLAMPED TO UNDERSIDE OF TOWER **WITHIN** 4 FEET OF FLEXIBLE PIPE CONNECTOR.
6. DOUBLE SUCTION INTAKES ARE SHOWN AS **A** SUETY PRECAUTION TO ELIMINATE ENTRAPMENT HAZARDS CAUSED BY THE PUMP SUCTION.

| | | |
|---|---|---|
| 0 | ~~AS NOTED~~ | 2015.08.14 |
| 0 | ~~REVISED AS NOTED~~ | MAY 2015 REV |
| 0 | ~~ISSUED FOR CONSTRUCTION~~ | DEC 2014 REV |
| | ISSUED FOR INFORMATION | AUG 2014 ISS |

| | | | |
|---|---|---|---|
| DESIGNED BY AE | DATE AUG 13/2015 | PROJ. ENG. CHECK | DATE |
| DRAWN BY AE | DATE AUG 13/2015 | DRAFTING CHECK | DATE |
| SCALE ~~AS NOTED~~ | | ARCHIVE | ~~31548A601~~ |

NOTE.- IMPERIAL DIMENSIONS
ALL ELEVATIONS AND CO-ORDINATES ARE IN FEET
~~ALL OTHER DIMENSIONS ARE IN FEET AND INCHES~~

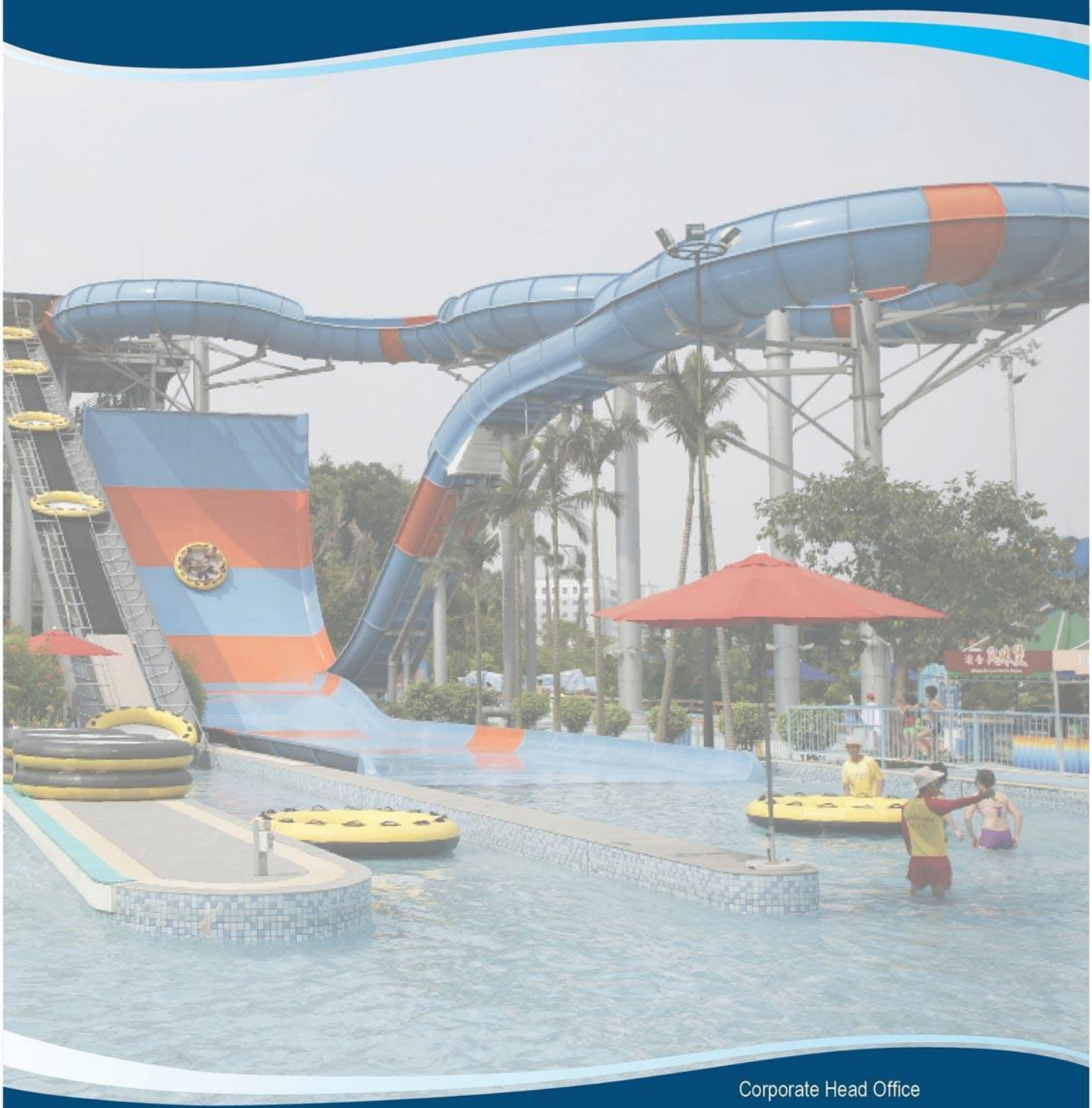

WHITE WATER
WhiteWater West Industries Ltd
6700 McMillan Way, Richmond, B.C. Canada V6W 1J7
Tel (604) 273-1068 Fax (604) 273-4518


GROUP A
SLIDE AD, AE, & AF
SLIDE PUMPING FLOW DIAGRAM

**EMERALD GLEN AQUATIC CENTER**
**DUBLIN, CALIFORNIA, UNITED STATES**

31,548 | GS-WWG- A601

WHITEWATER.



Corporate Head Office

WhiteWater West Industries Ltd.
6700 McMillan Way • Richmond • BC
V6W 1J7 • Canada
www.whitewaterwest.com
Tel: +1-604-273-1068 Fax: 604-27[illegible]
whitewater@whitewaterwest.com

## Attachment D – Facility Photos



**CITY OF DUBLIN**
**FISCAL YEAR 2022-23**
**BUDGET CHANGE FORM**

**Budget Change Reference #:** _____

**City Council's Approval Required**

From Un-Appropriated Reserves X  Budget Transfer Between Funds _____

From Designated Reserves _____  Other _____

| DECREASE BUDGET AMOUNT | | INCREASE BUDGET AMOUNT | |
|---|---|---|---|
| **Account** | **Amount** | **Account** | **Amount** |
| | | **EXP: General Fund - PCS - Contract Services** | |
| | | 10017610-64001 | $37,593 |

**REASON FOR BUDGET CHANGE**

Higher than budgeted slide and pool maintenance costs

**As Presented at the City Council Meeting** **1/10/2023**

************Finance Use Only************

Posted By: _____  Date: _____

Agenda Item 4.5

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Acceptance of Work – Project No. GI0119, Civic Center HVAC and Roof Replacement Project
*Prepared by: Michael Boitnott, Capital Improvement Program Manager*

## EXECUTIVE SUMMARY:

The City Council will consider the acceptance of the Civic Center HVAC and Roof Replacement Project, CIP No. GI0119. The project included the replacement of the flat roof assembly, roof-mounted HVAC equipment, modifications to the existing HVAC duct system, HVAC controls, minor structural upgrades, fire alarm panel and ancillary devices, T-bar ceilings and recessed lighting, interior painting, and new ethernet data cable drops.

## STAFF RECOMMENDATION:

Adopt the **Resolution** Accepting the Civic Center HVAC and Roof Replacement Project, CIP No. GI0119.

## FINANCIAL IMPACT:

The Civic Center HVAC and Roof Replacement Project, CIP No. GI0119, is complete and the project funding and cost were as follows:

| **Project Funding Source** | |
|---|---|
| General Fund | $2,387,634 |
| IT Fund | $200,000 |
| Internal Service Fund - Facilities | $2,587,366 |
| **Total Funding** | **$5,175,000** |

| **Estimated Expenditures** | |
|---|---|
| Design-Build Contract with Change Orders | $4,377,973 |
| Contract Services, Design, Salary, and Testing | $732,027 |
| **Total Expenditures** | **$5,110,000** |

| | |
|---|---|
| **Estimated Project Balance** | **$65,000** |

Upon the City Council's acceptance of the project, the capital improvement project will be closed at the end of this fiscal year and all unspent funds will be returned to their funding sources.

## DESCRIPTION:

On July 21, 2020, the City of Dublin awarded a Design/Builder Agreement to ADC Construction Management, Inc., for the Civic Center HVAC and Roof Replacement project (CIP No. GI0119) for $3,836,831. The project consisted of the replacement of the City Hall side of Civic Center's flat roof assembly, roof-mounted HVAC equipment, modifications to the existing HVAC duct system, HVAC controls, minor structural upgrades, fire alarm panel and ancillary devices, T-bar ceilings and recessed lighting, interior painting, and new ethernet data cable drops. On May 4, 2021, the City Council approved an additional $165,000 of work to furnish and install additional heating hot water piping, heating boiler, and modifications to the Civic Center building to accommodate the future Cultural Arts Center improvements. The project also included the temporary relocation of City staff and offices to the Cultural Arts Center side of Civic Center to allow for the improvements to be constructed.

Staff has determined that the project is complete and ADC Construction Management, Inc. has completed the warranty period requirements of the agreement and recommends that the City Council accept the project and release the maintenance bond. The capital improvement project will be closed at the end of this fiscal year and all unspent funds will be returned to their funding sources.

The balance of the Civic Center HVAC and roof replacement improvements for the Cultural Arts Center side of the building are included within the Cultural Arts Center project, which is currently under construction.

## STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted. A copy of this report was sent to ADC Construction Management, Inc.

## ATTACHMENTS:

1) Resolution Accepting the Civic Center HVAC and Roof Replacement Project, CIP No. GI0119
2) CIP No. GI0119

**RESOLUTION NO. XX - 23**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DUBLIN**

**ACCEPTING THE CIVIC CENTER HVAC AND ROOF REPLACEMENT PROJECT, CIP No. GI0119**

**WHEREAS,** on July 21, 2020, the City of Dublin entered into a Design/Builder Agreement with ADC Construction Management, Inc., to perform the work to replace HVAC and roof on the City Hall side of Civic Center, Project No. GI0119; and

**WHEREAS,** on May 4, 2021, the City Council approved additional improvements to furnish and install additional heating hot water piping, heating boiler, and modification to the Civic Center building to accommodate the future Cultural Arts Center; and

**WHEREAS,** said improvements have been completed in accordance with plans and specifications, and any approved modifications thereof, to the satisfaction of the City Engineer of the City of Dublin; and

**WHEREAS,** said improvements have been in place for more than one year, thus completing the obligation of the one-year warranty period allowing the maintenance bond to be released after the Notice of Completion is filed.

**NOW, THEREFORE, BE IT RESOLVED** that the City Council of the City of Dublin does hereby accept the Civic Center HVAC and Roof Replacement improvements, Project No. GI0119 and authorize Staff to file a Notice of Completion with Alameda County.

**BE IT FURTHER RESOLVED** that the City Council of the City of Dublin does hereby authorize the City Manager or designee to release the retention, if after 35 days of filing the Notice of Completion there are no subcontractor claims.

{Signatures on the following page}

**PASSED, APPROVED AND ADOPTED** this 10th day of January 2023, by the following vote:

**AYES:**

**NOES:**

**ABSENT:**

**ABSTAIN:**

_____
Mayor

**ATTEST:**

_____
City Clerk

Number **GI0119** **CIVIC CENTER HVAC AND ROOF REPLACEMENT** Program **GENERAL**

**PROJECT DESCRIPTION**

This project provides for the design and replacement of the heating, ventilation, and air conditioning (HVAC) system and controls, roof replacement, associated building modifications, and code compliance upgrades for the City Hall portion of the Civic Center complex. The existing HVAC and roof systems are at the end of their useful life and are due for replacement. A new HVAC system and controls will be more energy efficient and have a greater ability to be adjusted. Additionally, the project will provide the heating hot water boilers for the entire Civic Center complex. With the roof replacement, the project will also upgrade communications infrastructure for new data connections to offices, workstations, and conference rooms. The project will be completed in several phases to minimize disruption to the public and to Staff working within the buildings.

The HVAC and roof improvements for the future Cultural Arts Center portion of the Civic Center complex will be completed with the renovation of the Cultural Arts Center Project, CIP No. GI0120.

This project is funded by $2 million in a General Fund Reserve set aside for this purpose in addition to the Internal Service Fund for Facilities Replacement.

**ANNUAL OPERATING IMPACT:** None

**MANAGING DEPARTMENT:** Public Works

| | | | | 2022-2027 CAPITAL IMPROVEMENT PROGRAM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **ESTIMATED COSTS** | | **PRIOR YEARS** | **2021-2022 BUDGET** | **2022-2023** | **2023-2024** | **2024-2025** | **2025-2026** | **2026-2027** | **FUTURE YEARS** | **TOTALS** |
| 9100 | Salaries & Benefits | $81,422 | $7,678 | | | | | | | $89,100 |
| 9200 | Contract Services | $556,875 | $49,025 | | | | | | | $605,900 |
| 9400 | Improvements | $3,613,331 | $161,769 | | | | | | | $3,775,100 |
| 9500 | Miscellaneous | $771 | $4,129 | | | | | | | $4,900 |
| 9600 | Equipment | $700,000 | | | | | | | | $700,000 |
| **TOTAL** | | **$4,952,398** | **$222,602** | | | | | | | **$5,175,000** |

| **FUNDING SOURCE** | | **PRIOR YEARS** | **2021-2022 BUDGET** | **2022-2023** | **2023-2024** | **2024-2025** | **2025-2026** | **2026-2027** | **FUTURE YEARS** | **TOTALS** |
|---|---|---|---|---|---|---|---|---|---|---|
| 1001 | General Fund | $2,365,032 | $22,602 | | | | | | | $2,387,634 |
| 6605 | IT Fund | | $200,000 | | | | | | | $200,000 |
| 6205 | Internal Service Fund - Facilities | $2,587,366 | | | | | | | | $2,587,366 |
| **TOTAL** | | **$4,952,398** | **$222,602** | | | | | | | **$5,175,000** |

| **ANNUAL OPERATING IMPACT** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

Agenda Item 4.6

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Avalon West/St. Patrick's Way Development Public Art
*Prepared by: Shaun Chilkotowsky, Heritage & Cultural Arts Manager*

## EXECUTIVE SUMMARY:

The City Council will consider approving AvalonBay Communities proposal for public art at the Avalon West/St. Patrick's Way development project that is now under construction. The proposed artwork, designed by artist Norie Sato, is adjacent to the new residential building and would parallel the north side of St. Patrick's Way, between Golden Gate Drive and Regional Street.

## STAFF RECOMMENDATION:

Approve the artwork proposal by AvalonBay Communities for the Avalon West/St. Patrick's Way development project.

## FINANCIAL IMPACT:

There is no impact on City funds as this is developer-installed artwork. AvalonBay Communities' public art obligation for this project is estimated at $775,000.

## DESCRIPTION:

Background
At its May 1, 2018, meeting, the Dublin City Council adopted Resolutions 40-18 and 41-18, authorizing the development of an 8.53-acre site within Downtown Dublin, the construction and extension of St. Patrick's Way between Regional Street and Amador Plaza Road, and the construction of a 499-unit residential building.

Artist Selection
AvalonBay Communities (Developer) hired a public art consultant (Consultant) to assist with developing and managing the project's public art component. The Consultant assisted with identifying potential sites for the artwork and the development of a project scope. The Consultant

developed a pool of 15 artists that were presented to the Developer for review and selection. The artist's experience, mediums used, geography, and fit within the established scope were considered. Following a review of the artists, three were selected as semi-finalists to develop site-specific proposals. Following the Developer's review of the site-specific proposals and artist interviews, the Developer selected artist Norie Sato and the proposal *"ACROSSROADSACROSS."*

Design Proposal

"ACROSSROADSACROSS" is a series of approximately 140 painted, perforated, and curved aluminum panels that span about 400 feet along the north side of St. Patrick's Way in Downtown Dublin. The panels are between 5 feet and 7 feet high, on top of an 18-inch-tall seating wall, making the total height approximately 6.5 feet to 8.5 feet tall. The panels, of various radii, shapes, and orientations, are waterjet cut with perforations forming different patterns that create a moire effect and shifting views as one travels the length of the adjacent road or sidewalk. In addition, 11 column lights and three flower lights provide accent lighting incorporated into the project. The artwork layout includes a number of gaps ranging from 6 feet to 16 feet wide, allowing for seating along the length of the piece.

The artwork is intended to tell a nonlinear story of Dublin's history and geography which unfolds as one travels along the artwork. Imagery and symbols of clovers, shamrocks, and indigenous plants and flowers are abstracted and used in the panels. A detailed proposal is included with this Staff Report as Attachment 1.

Additionally, the proposed artwork will be in the public right-of-way. Through a Public Art Installation and Maintenance Agreement and Long-Term Encroachment Agreement, the Developer would remain fully responsible for the long-term care and maintenance of the piece.

Staff Review and Community Outreach

On August 25, 2022, the Developer attended the Farmers' Market at Emerald Glen Park to present the proposal to the community and solicit feedback. More than 30 responses were received, with the community overall supportive of the project. One project goal was to help create a sense of place, with comments addressing the impact the artwork would have on the character and feel of the Downtown street.

Staff from Public Works, Economic Development, Community Development, Parks and Community Services, and Dublin Police Services have reviewed the artwork proposal. Staff has no concerns with the proposed artwork's safety or design and determined that it aligns with the City's Public Art Master Plan.

Heritage & Cultural Art Commission Review

At its November 10, 2022 meeting, the Heritage and Cultural Arts Commission reviewed the proposal. The artwork received positive feedback, but some concerns and questions were raised not directly related to the artwork that needed clarification. At the meeting, the Commission voted not to recommend the artwork. The following summarizes the Commission's concerns:

- Uncertainty of future Downtown development adjacent to the proposed project location

- Potential security concerns that may arise from the proposed project
- Lack of clarity on the goals the Developer and City have for this project
- Inability to visualize the proposed project and coinciding site improvements

Staff and the Developer worked to address the concerns raised and at its December 8, 2022, meeting, the Commission reconsidered the artwork proposal. Staff and the Commission addressed initial concerns, which are outlined below:

- *Concern #1 Uncertainty of future Downtown development adjacent to the proposed project location*
  Staff does not expect conflict with future projects in the short or mid term. The Avalon West project is surrounded by the existing shopping center to the north, a future 113-unit senior residential project to the west, and Connolly Station to the east. These planned development projects will benefit from the extension of St. Patrick's Way and the community gathering space the new street will provide. The adjacent shopping center continues to be improved with a recent proposal by H-Mart to occupy the commercial storefront formerly occupied by Orchard Supply Hardware. While there are no current plans to redevelop the shopping center, should it occur at some point, the artwork could be modified, relocated, or completely decommissioned and a new piece installed elsewhere. Any future modifications to the artwork would be presented to the Commission for consideration.
- *Concern #2 Potential security concerns that may arise from the proposed project*
  Staff believes that the roadway, landscaping, and other pedestrian friendly improvements, including decorative light poles, string lights, a variety of seating options, and entry monuments, required as part of the improvement of St. Patrick Way, will bring more traffic and visibility to the project site. The proposed artwork will also enhance the lighting by including columns and decorative pathway lights. The proposed artwork is transparent and includes perforated metal panels with gaps in selected areas. Lastly, the artwork was presented to Dublin Police Services for review, and no concerns were noted.
- *Concern #3 Lack of clarity on the goals the Developer and City have for this project*
  Prior to the Developer approaching the City with the proposed artwork, the City had planned improvements to make St. Patrick Way a future civic gathering space. These improvements included a seat wall, electrical infrastructure, overhead lighting, entry monuments, safety bollards, and contrasting crosswalks that helped create a sense of place. The City has envisioned the project site as a location for future Downtown events and entered into a Community Benefit Program Agreement with the Developer to ensure these desired improvements come to fruition. In coordination with the artist, the Developer's proposal adds another element to further enhance this vision.
- *Concern #4 Inability to visualize the proposed project and coinciding site improvements*
  This is a unique type of project that the Commission had not been presented with previously, including a new street, sidewalk, and landscaping that have not yet been built. In coordination with the artist and Developer, a more detailed artwork proposal was developed that included details such as site plans, enhanced renderings, artwork samples, source images, and angled views. This enhanced presentation, included as Attachment 1,

helped to further clarify the project.

Following discussion and deliberations, the Commission voted unanimously to recommend the artwork to the City Council for approval. The Commission appreciated the more thorough and comprehensive presentation that allowed for an informed decision and ensured the project met the criteria that guide the City's Public Art Program. This includes enhancing pedestrian friendly places, incorporating artwork into the built environment, and strengthening the character of the Downtown corridor and neighborhood.

Next Steps

If approved by the City Council, the Developer and the City must enter into a Public Art Installation and Maintenance Agreement and a Long-Term Encroachment Agreement. These agreements ensure the art is installed as proposed and the Developer properly maintains the artwork for its full lifespan according to City requirements. Staff will return to the City Council at a future meeting for approval of these agreements, including a detailed scope of work and schedule for completion.

## STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted, and a copy of the Staff Report was provided to Developer.

## ATTACHMENTS:

1) Artwork Design Proposal by Artist Norie Sato

# Avalon West Dublin
# Public Art

## ACROSSROADSACROSS
## Norie Sato

## Dublin, CA

# ACROSSROADSACROSS

Norie Sato

**A nonlinear story of the history, geography, nature and symbols of Dublin, an important crossroads for the region, which unfolds as one travels along the artwork.**



## The Artwork:

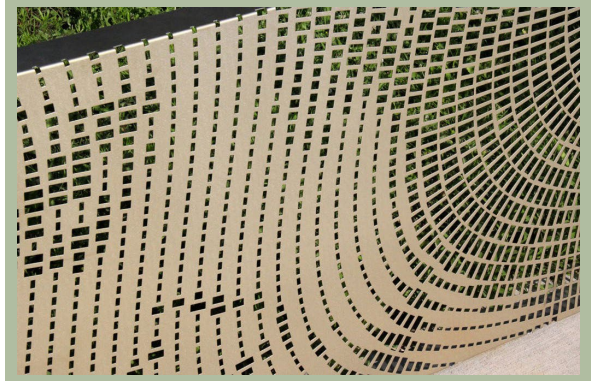
1.A Series of curved painted aluminum panels waterjet cut with various patterns create layering, moire pattern movement and shifting views as one moves along the length of the road. Depending on the speed and location, different combinations and legibility of various images emerge, disappear, become abstract, pull into focus. These panels will create the bulk of the screening and a backdrop to the street. The curves soften the effect of the screen, while layering images and allowing interesting juxtapositions between different panels.

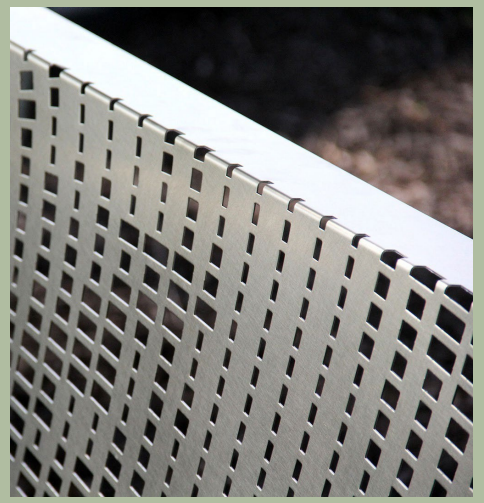
The panels will be created in collaboration with AZahner Company, a fabricator based in Kansas City, using their ImageLines system of transforming images into perforations. This "standardization" allows for a more cost effective method of producing dynamic and unique image effects. They have a great deal of expertise, capability and options for materials and other fabrication techniques. I have worked with them on other recent projects and feel them unique- ly well-suited for this project and complexities.

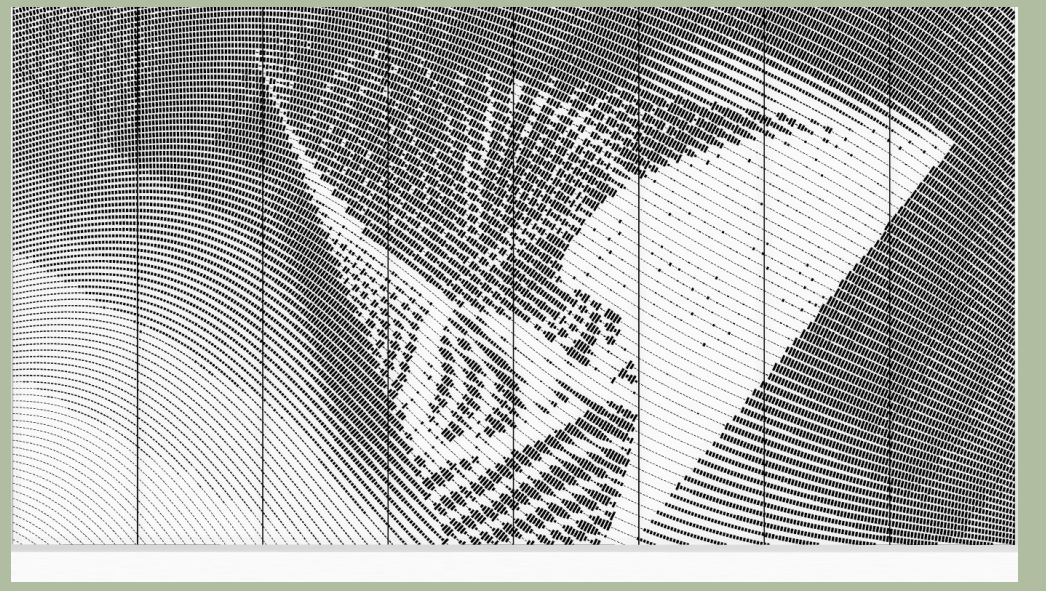
The proposed material is painted aluminum, which will be bent and cut as necessary for structure and attachment. The attachment to the concrete seat- ing wall will be with an added angle for attachment, which will be mechanical, using expansion anchor fasteners. These will allow for strength, permanence, yet replaceability.

The height of the screens are 5' -7' X various radii. When placed on an 18" high seating wall, the height of the screens will be at least 6'8" above grade. In the proposed layout, approximately 140 panels are included.

2.Lighting will be incorporated in 2 ways: A): Cylindrical colums out of the same panel materials and colors with perforated patterns and up lights at bot- tom
B): "Flower" lights are whimsical sculptural interpretations of a flower, continuing the thematic connection emanate light from the "petals"





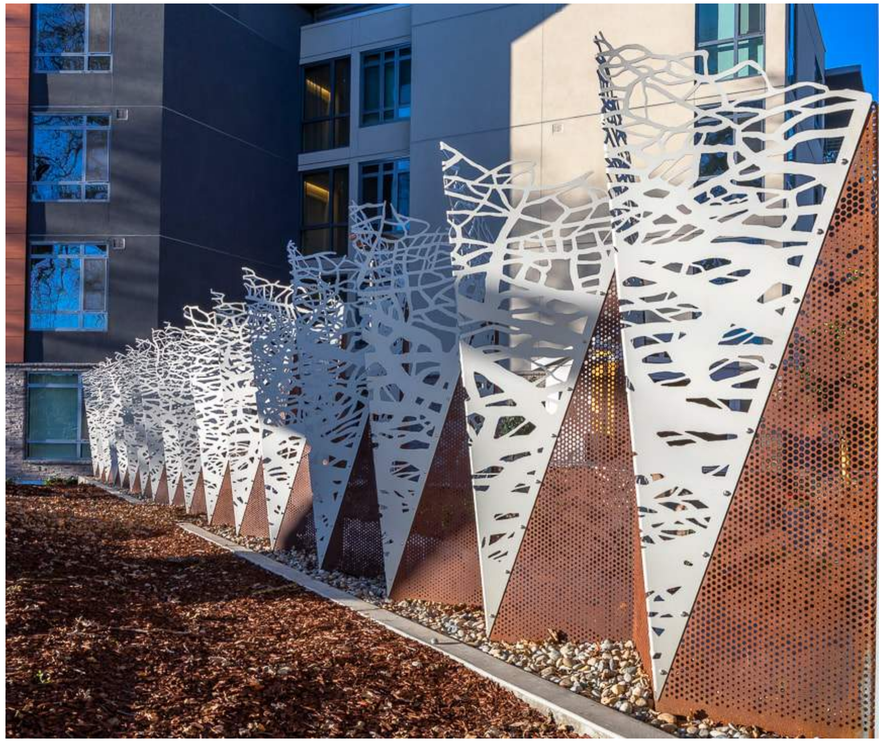


For more information about the capabilities of this system, please go to:
https://www.azahner.com/labs/imagelines/

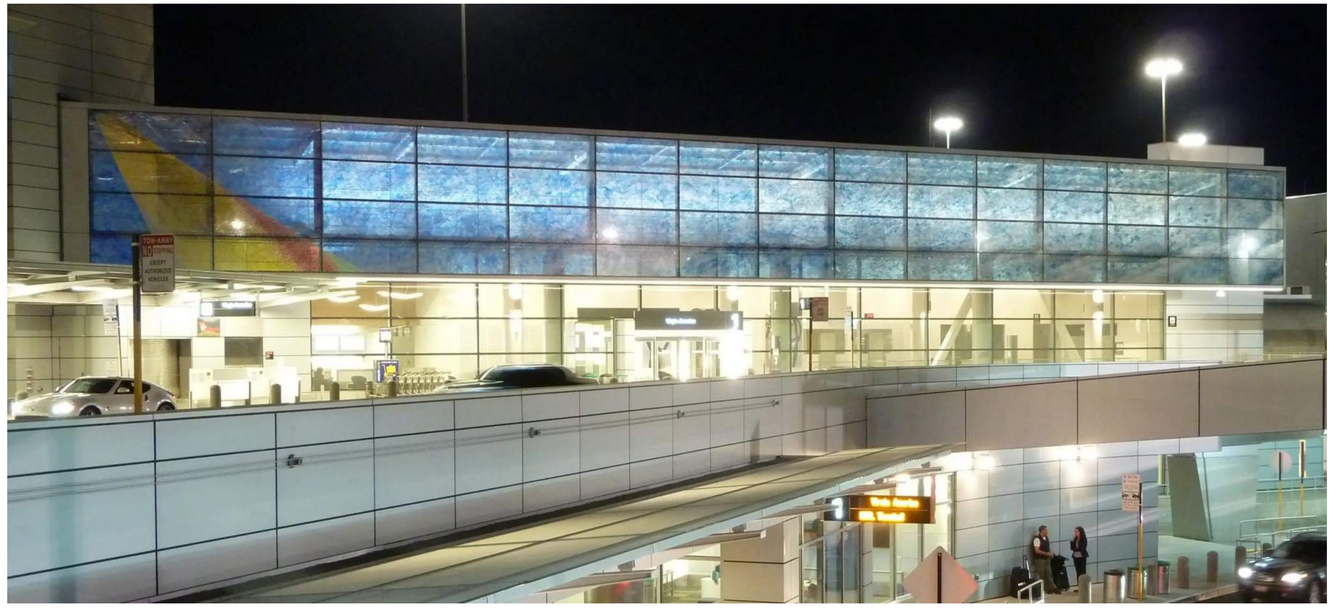
# Norie Sato

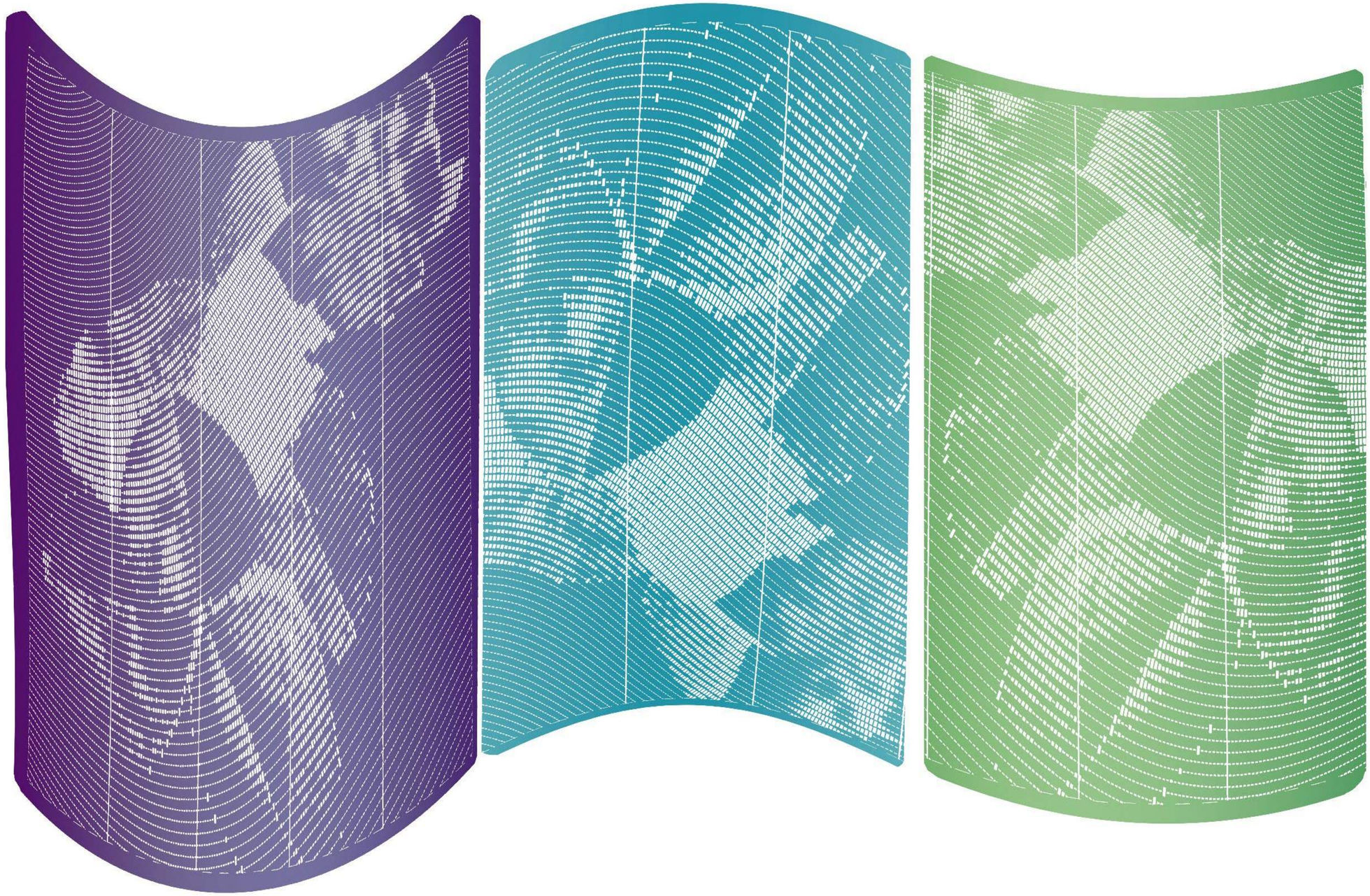








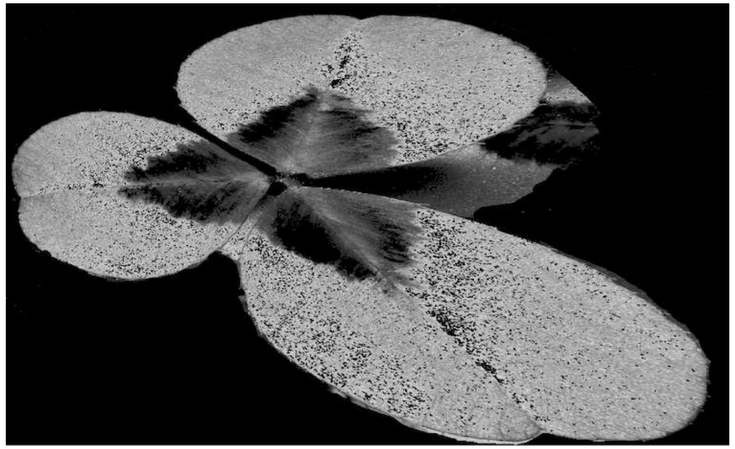


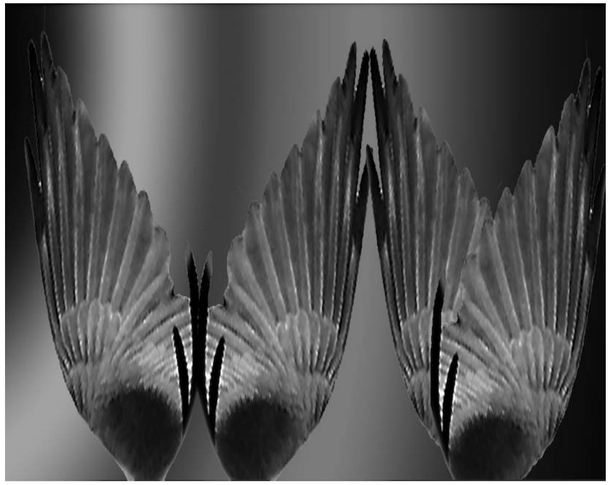


Patterns may be placed on single panels or over several to create a rhythm across the wall

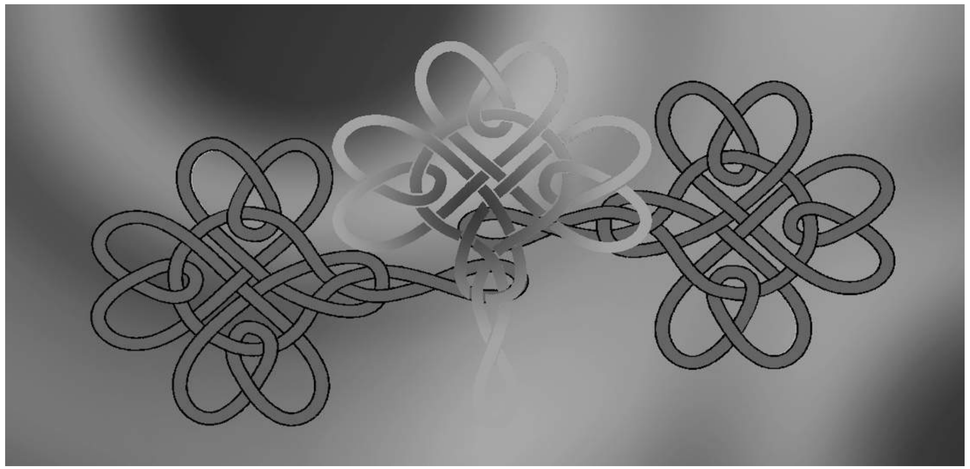
# Source Images









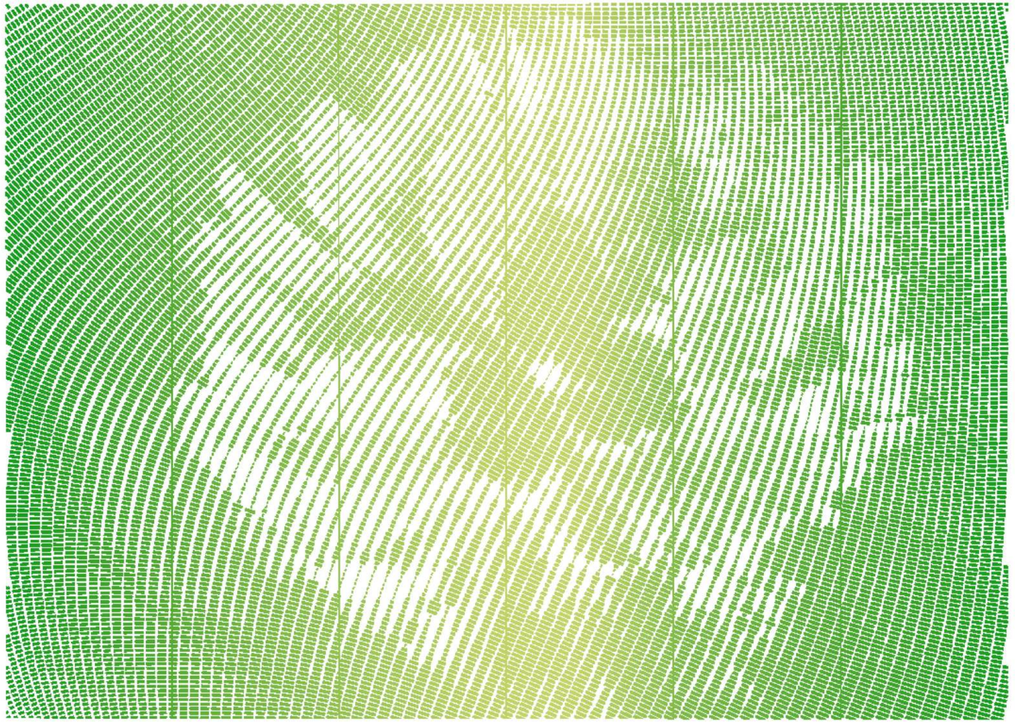




# Artwork Samples





# Lighting elements:

## 2 Types of lighting elements

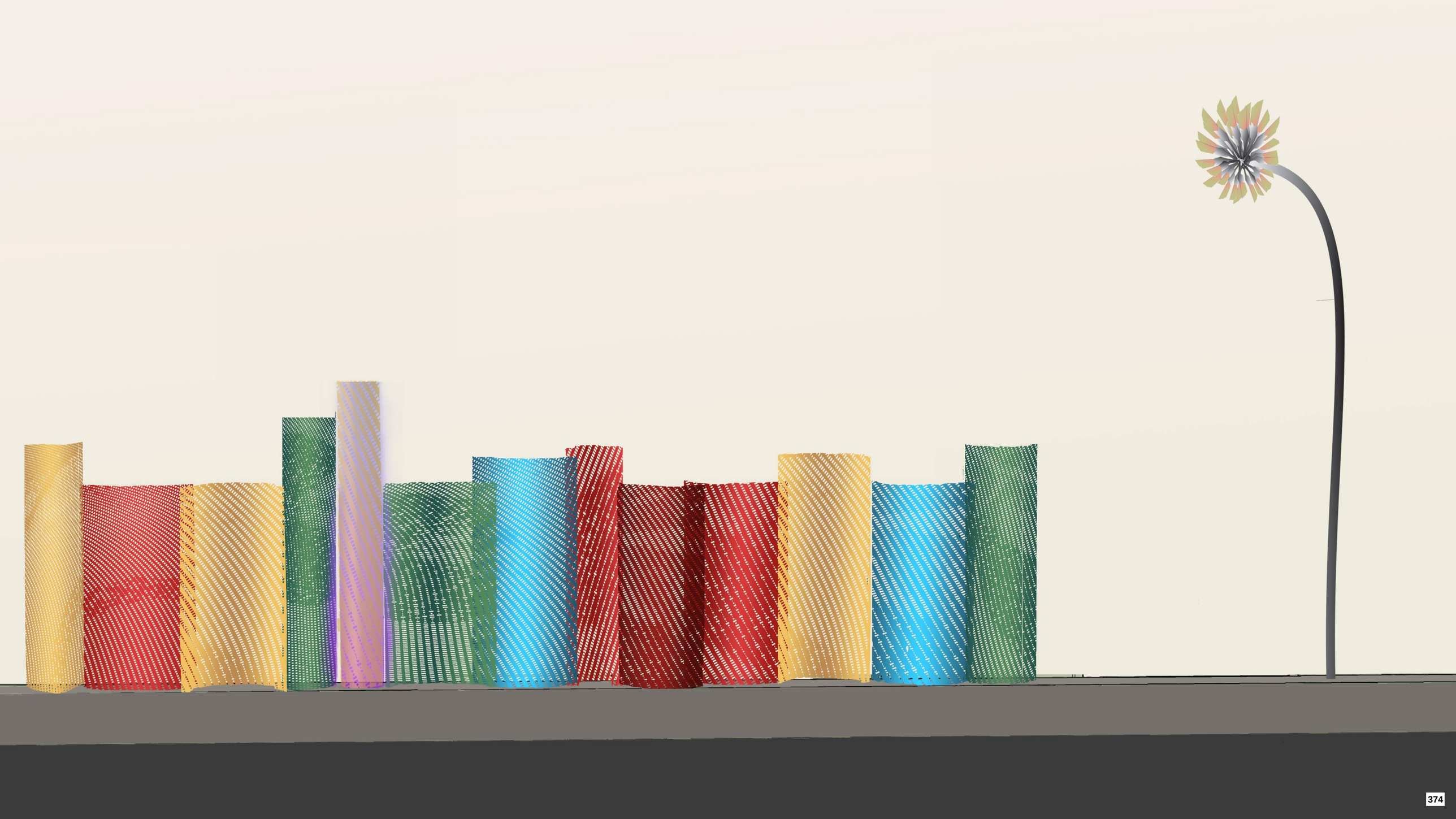


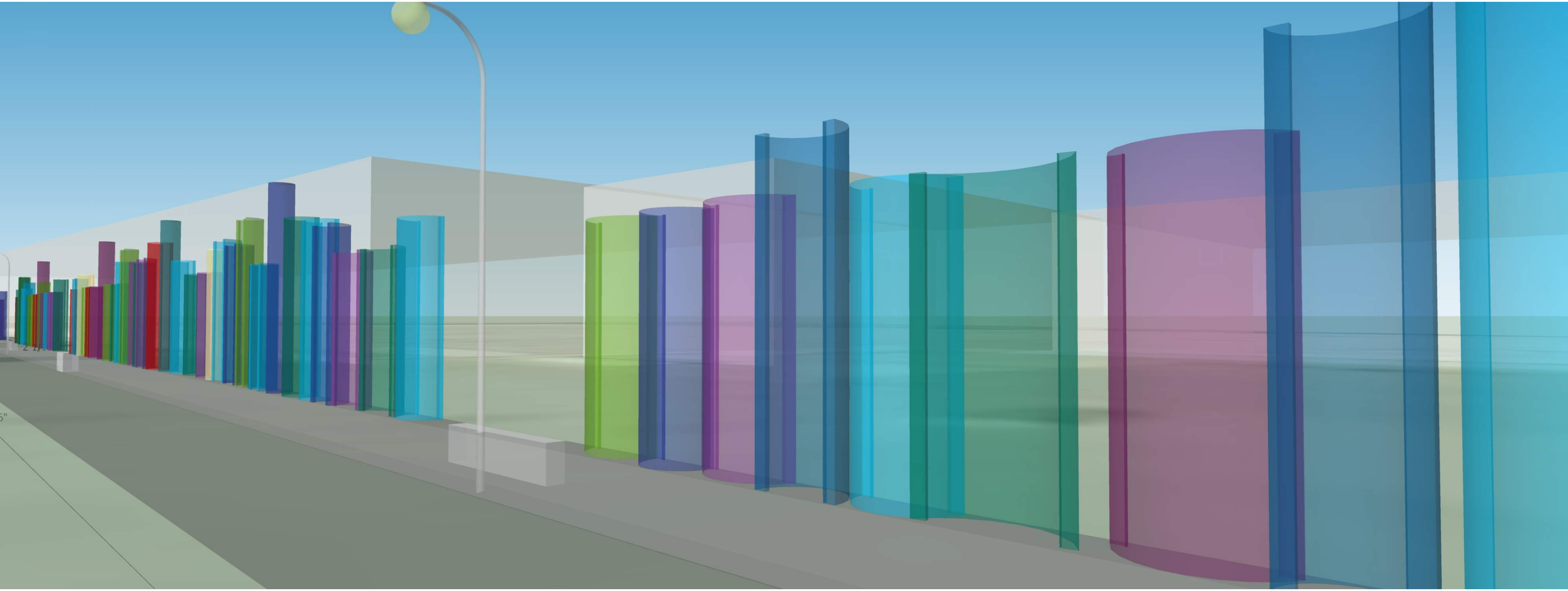
CyIndrical structure made
of perforated panels
is uplit by an LED bulb at the base.
Light will be seen through the per-
forations as well as “leaks” of light
toward the panels next to them.

LED light fixtures will be used, with the same
fixtures used in both types of lights.



“Clover Flower” Light Concept
Creates a sculptural counterpoint to the
geomety of the panels and cylindrical
lighting elements.



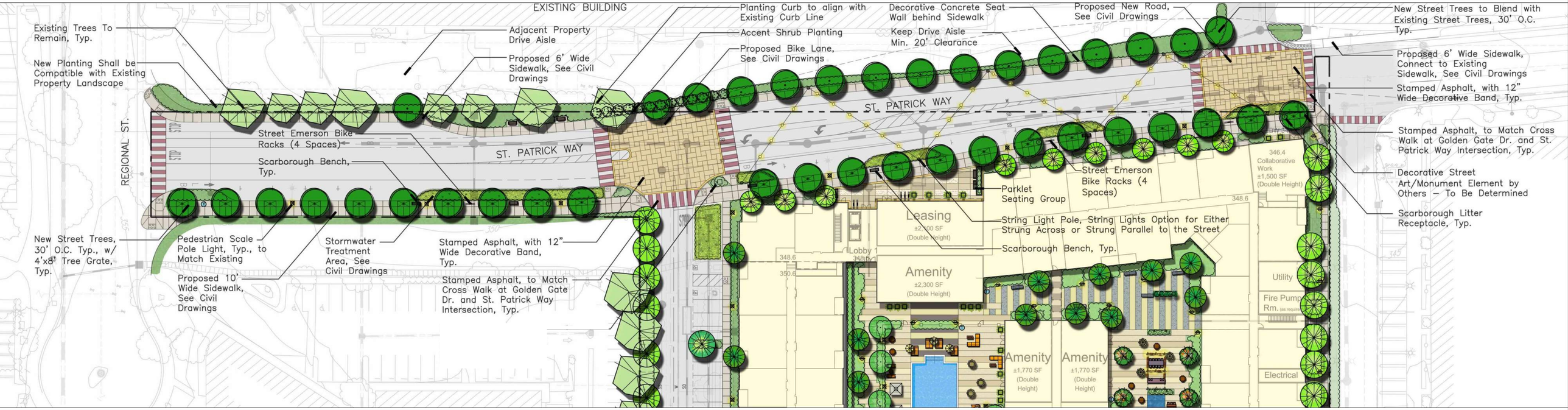




Sidewalk in front of artwork

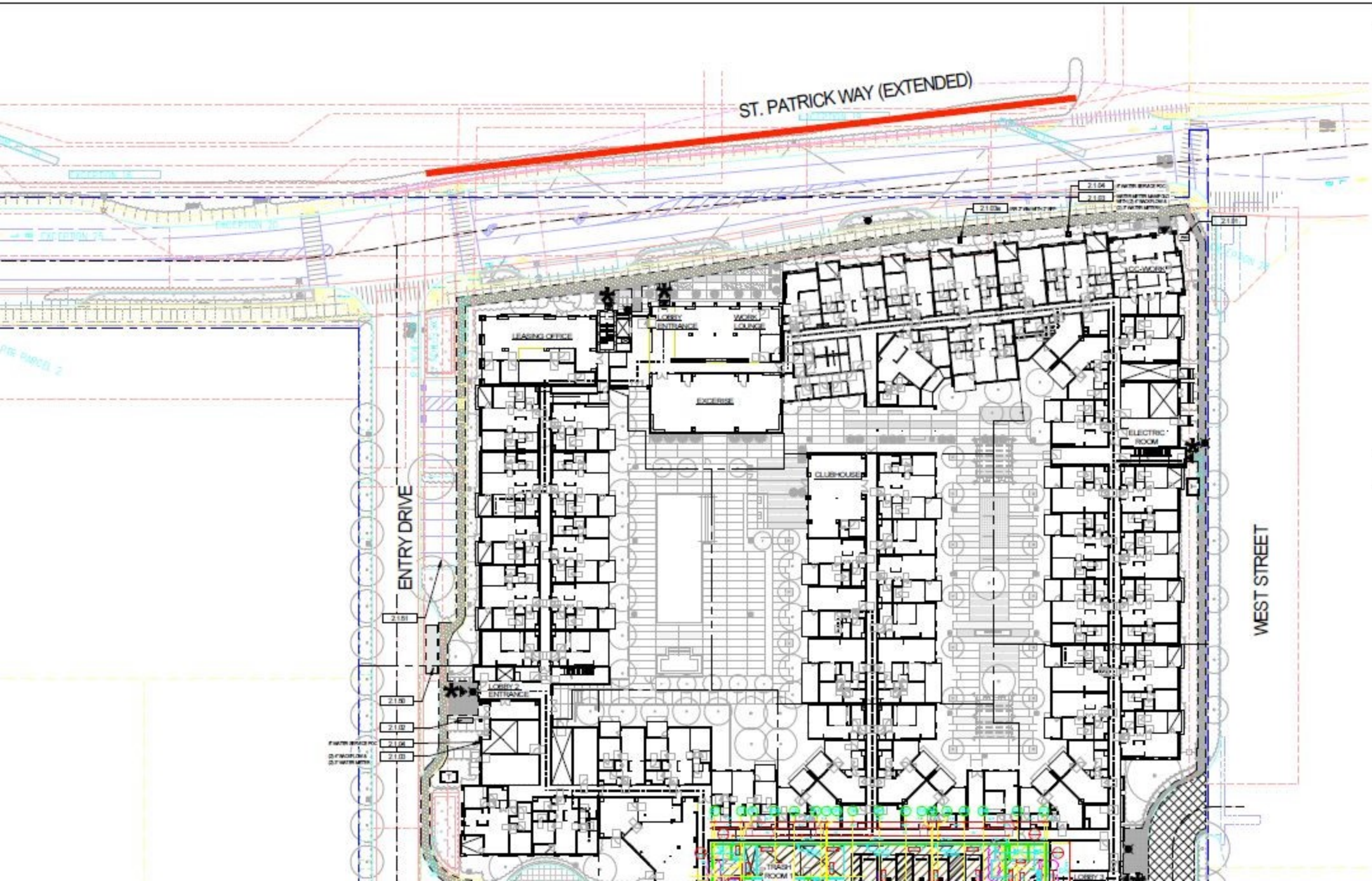
Curved panels vary by their “radius” and heights:

| | | | |
|---|---|---|---|
| 32” x 5’ | | | |
| 28” x 5’ | 28” x 6’ | | |
| 25” x 5’ | 25” x 6’ | 25” x 6’6” | |
| 22” x 5’ | 22” x 6’ | 22” x 6’ 6” | 22” x 7’ |
| 18” x 5’ | 18” x 6’ | 18” x 7’ | |




# Streetscape Improvement Enhancements:

1. Seatwall
2. Decorative paving
3. String lights
4. Drop-down manual bollard sleeves
5. Electrical outlets

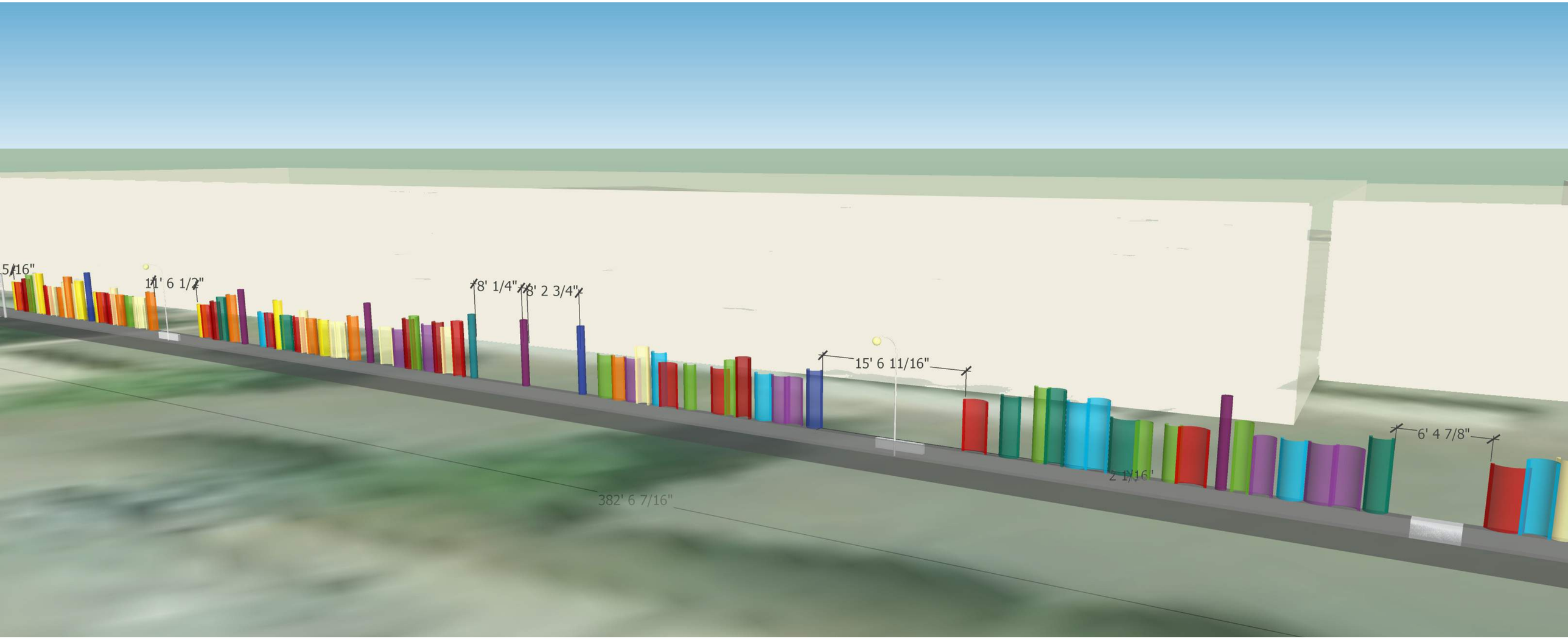



## KEY NOTES

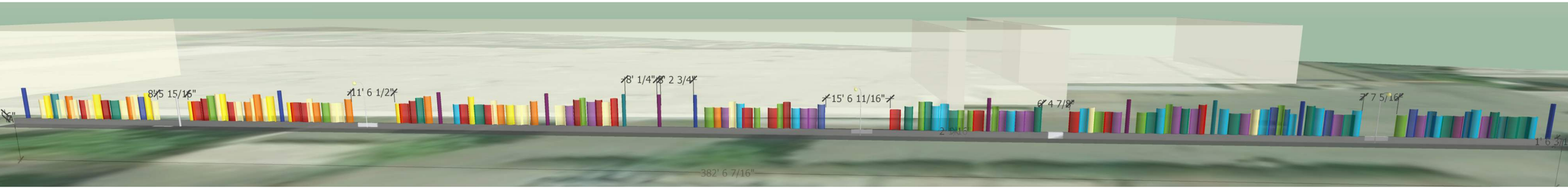
| | |
|---|---|
| 2.1.01 | FIRE SERVICE BACKFLOW PREVENTER |
| 2.1.01a | FIRE DEPARTMENT BUILDING ACCESS |
| 2.1.02 | GAS METERS, S.P.D. |
| 2.1.03 | WATER METERS, S.P.D. |
| 2.1.03a | IRRIGATION WATER SERVICE & BFP |
| 2.1.04 | DOMESTIC WATER CONNECTION, S.P.D. |
| 2.1.50 | TRASH STAGING & LOADING AREA |
| 2.1.51 | MAIL CARRIER PARKING |

## SYMBOLS LEGEND

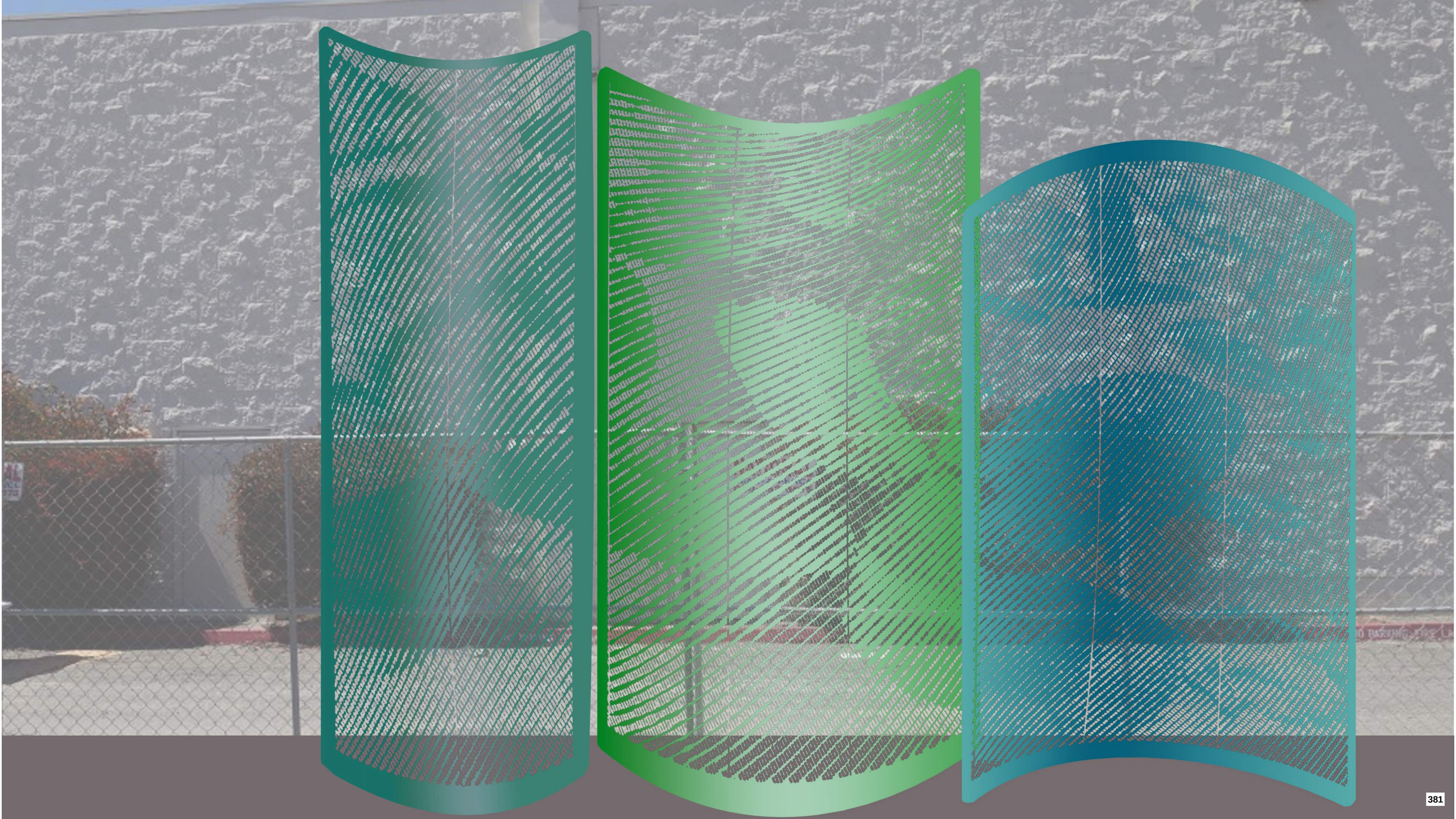
- FDC — FIRE DEPT. CONNECTION
- FIRE DEPT. ACCESS
- FIRE HYDRANT
- KNOX BOX
- T — TRANSFORMER
- ACCESSIBLE BUILDING ENTRANCE
- ACCESSIBLE PATH OF TRAVEL (5% SLOPE IN AND 2% CROSS SLOPE, TYPICAL)
- EMERGENCY VECHICLE ACCESS (EVA) LANE
- PROPERTY LINE
- EASEMENT LINE, S.C.D.
- CENTERLINE OF STREET




Seating openings in artwork vary from 6’ to 16’ long




Layout and colors of the panels over the nearly 400’ length of the site



Agenda Item 4.7

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Authorizing Remote Meetings of City Council and City Commissions Due to Increase in COVID-19 Cases
*Prepared by: John Bakker, City Attorney*

### EXECUTIVE SUMMARY:

From March 2020 through September 2021, the City conducted meetings of its legislative bodies remotely pursuant to various executive orders that suspended certain Brown Act provisions. In October 2021, the City returned to in-person meetings and the Brown Act was amended to allow for teleconferencing during a state of emergency. Under the new law, AB 361, the City can continue to conduct virtual meetings where the Governor has proclaimed a State of Emergency, or state or local health officials have imposed or recommended social distancing, if the City Council makes certain required findings. From January 11 – February 10, 2022, and since May 3, 2022, the City Council has operated under a resolution pursuant to AB 361 authorizing teleconferenced meetings for at least 30 days. The City Council will consider adopting a resolution that would allow for virtual attendance for the next 30 days.

### STAFF RECOMMENDATION:

Adopt the **Resolution** Finding That There is a Proclaimed State of Emergency; Finding That Meeting in Person Would Present Imminent Risks to the Health or Safety of Attendees as a Result of the State of Emergency; and Authorizing Remote Teleconferenced Meetings of the Legislative Bodies of the City of Dublin Pursuant to AB 361.

### FINANCIAL IMPACT:

None.

DESCRIPTION:

On March 4, 2020, Governor Newsom declared a State of Emergency to make additional resources available, formalize emergency actions already underway across multiple state agencies and departments, and help the State address the broader spread of COVID-19.

On March 18, 2020, the City Council adopted a resolution ratifying the proclamation of a local state of emergency by the Director of Emergency Services due to COVID-19.

On March 17, 2020, in response to the COVID-19 pandemic, Governor Newsom issued Executive Order N-29-20, which suspended certain provisions of the Brown Act in order to allow local legislative bodies to conduct meetings telephonically or by other means. Additionally, the State implemented a shelter-in-place order, requiring all non-essential personnel to work from home.

At that time and through September 2021, the City's legislative bodies met by teleconference. On June 11, 2021, Governor Newsom issued Executive Order N-08-21, which among other things, rescinded certain clauses of Executive Order N-29-20 after September 30, 2021, including clauses that suspended certain provisions of the Brown Act. Thus, effective October 1, 2021, agencies would have had to transition back to public meetings held in full compliance with the Brown Act. The City of Dublin began meeting in person beginning in October 2021.

Since the Governor issued Executive Order N-08-21, the highly contagious Delta variant has emerged, causing a spike in cases throughout the state and within the Alameda County. Additionally, since then, the Omicron variants have emerged and been designed as a variant of concern by the United States, and the number of cases in the City have increased over the last month.

On September 16, 2021, the Governor signed AB 361 (2021) which allows for local legislative and advisory bodies to continue to conduct meetings via teleconferencing under specified conditions and includes a requirement that the Council make specified findings. AB 361 took effect immediately.

AB 361 allows local legislative bodies to continue to meet remotely after the expiration of the clauses of Executive Order N-29-20. Under AB 361, the City and its legislative bodies may meet remotely when:

- The local agency holds a meeting during a declared state of emergency;
- State or local health officials have imposed or recommended measures to promote social distancing;
- Legislative bodies declare the need to meet remotely due to present imminent risks to the health or safety of attendees.

On January 11, 2022, the City Council adopted a resolution authorizing remote teleconferenced meetings for a period of 30 days pursuant to AB 361. That resolution expired on February 10, 2022.

At its April 19, 2022 meeting, the City Council directed Staff to bring a resolution to the May 3, 2022 meeting to allow the City Council and the City's legislative bodies to meet virtually, including hybrid meetings, pursuant to AB 361. At its May 3, May 17, June 7, June 21, July 19, August 16, September 6, 2022, October 18, 2022, November 1, 2022, November 15, 2022, December 6, 2022, and December 20, 2022 meetings, the City Council adopted Resolution Nos. 39-22, 48-22, 65-22, 84-22, 92-22, 101-22, 104-22, 120-22, 127-22, 130-22, 144-22, and 148-22 respectively, that included the necessary findings pursuant to AB 361 to allow the City Council and the City's legislative bodies to meet remotely or in a hybrid format for 30 days.

The City meets the requirements to hold meetings remotely in order to ensure the health and safety of the public:

- The Governor has declared a State of Emergency, and the City Council has ratified the proclamation of a local emergency by the Director of Emergency Services;
- The CDC recommends social distancing of at least six feet due to COVID-19;
- There continues to be COVID-19 cases within the state and throughout Alameda County;
- Meeting in person would present imminent risks to the health or safety of attendees, the legislative bodies, and staff.

The proposed resolution includes the necessary findings pursuant to AB 361 to allow the City Council and the City's legislative bodies to meet remotely or in a hybrid format for the next 30 days. The City Council would need to adopt a subsequent resolution declaring the need to continue to meet remotely to allow for such meetings after that 30-day period.

## STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted.

## ATTACHMENTS:

1) Resolution Finding That There is a Proclaimed State of Emergency; Finding That Meeting in Person Would Present Imminent Risks to the Health or Safety of Attendees as a Result of the State of Emergency; and Authorizing Remote Teleconferenced Meetings of the Legislative Bodies of the City of Dublin Pursuant to AB 361

**RESOLUTION NO. xx-23**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DUBLIN**

**FINDING THAT THERE IS A PROCLAIMED STATE OF EMERGENCY; FINDING THAT MEETING IN PERSON WOULD PRESENT IMMINENT RISKS TO THE HEALTH OR SAFETY OF ATTENDEES AS A RESULT OF THE STATE OF EMERGENCY; AND AUTHORIZING REMOTE TELECONFERENCED MEETINGS OF THE LEGISLATIVE BODIES OF THE CITY OF DUBLIN PURSUANT TO AB 361**

**WHEREAS**, all meetings of the City of Dublin's legislative bodies are open and public, as required by the Ralph M. Brown Act (Cal. Gov. Code sections 54950 – 54963), so that any member of the public may attend, participate, and watch the City's legislative bodies conduct their business; and

**WHEREAS**, on March 4, 2020, Governor Newsom declared a State of Emergency to make additional resources available, formalize emergency actions already underway across multiple state agencies and departments, and help the State prepare for a broader spread of the novel coronavirus disease 2019 ("COVID-19"); and

**WHEREAS**, on March 18, 2020, the City Council adopted a resolution ratifying the proclamation of a local emergency by the Director of Emergency Services due to COVID-19; and

**WHEREAS**, on March 17, 2020, in response to the COVID-19 pandemic, Governor Newsom issued Executive Order N-29-20 suspending certain provisions of the Ralph M. Brown Act in order to allow local legislative bodies to conduct meetings telephonically or by other means; and

**WHEREAS**, as a result of the COVID-19 pandemic, and pursuant to Executive Order N-29-20 and its successors, the City Council met primarily virtually through September 2021; and

**WHEREAS**, on June 11, 2021, Governor Newsom issued Executive Order N-08-21, which, effective September 30, 2021, ended the provisions of Executive Order N-29-20 that allows local legislative bodies to conduct meetings telephonically or by other means; and

**WHEREAS**, on September 16, 2021, Governor Newsom signed AB 361 (2021) which allows for local legislative bodies and advisory bodies to conduct meetings via teleconferencing under specified conditions and includes a requirement that the City Council make specified findings. AB 361 (2021) took effect immediately; and

**WHEREAS**, under AB 361 (2021), an agency meeting virtually requires that the Governor declare a State of Emergency pursuant to Government Code section 8625; and

**WHEREAS**, AB 361 (2021) further requires that state or local officials have imposed or recommended measures to promote social distancing, or, requires that the legislative body determines that meeting in person would present imminent risks to the health and safety of attendees; and

**WHEREAS**, such conditions now exist in the City, specifically, Governor Newsom has

declared a State of Emergency due to COVID-19; and

**WHEREAS**, since the issuance of Executive Order N-08-21, the highly contagious Delta variant of COVID-19 has emerged, causing an increase in COVID-19 cases throughout the State and Alameda County; and

**WHEREAS**, on November 30, 2021, the Omicron variant was designated as a variant of concern by the United States; and

**WHEREAS**, cases of the highly contagious Omicron variant, including a subvariant called BA.2, continue to occur in Alameda County and require quarantine periods for exposure; and

**WHEREAS**, the Centers for Disease Control and Prevention ("CDC") continues to recommend physical distancing of at least 6 feet from others outside of the household; and

**WHEREAS**, because of the ongoing existence COVID-19 cases due in part to the highly contagious Omicron variants of COVID-19, the City is concerned about the health and safety of all individuals who intend to attend City Council and meetings of the City's other legislative bodies; and

**WHEREAS,** the City Council finds that the imminent risks of the City's legislative bodies holding in person meetings to the health or safety of attendees exists due in part to the Omicron variants of COVID-19; and

**WHEREAS**, the City Council finds, acting as a legislative body pursuant to Government Code section 54952(a) and for the benefit of all legislative bodies created by the City Council pursuant to Government Code section 54952(b), that the presence of COVID-19 and the Delta and Omicron variants would present imminent risks to the health or safety of attendees, staff, and members; and

**WHEREAS**, teleconference meetings may include hybrid meetings, in which all or some members of the legislative body meet in person while others attend by teleconference, and members of the public are either allowed to participate only by teleconference or both in person and by teleconference ("hybrid meetings"). The purpose of hybrid meetings is to allow for multiple modes of attending meetings while reducing the risks of COVID-19, including the Delta and Omicron variants; and

**WHEREAS**, the City shall ensure that its meetings comply with the provisions required by AB 361 (2021) for holding teleconferenced meetings.

**NOW, THEREFORE, BE IT RESOLVED** by the City Council of the City of Dublin as follows:

1. The above recitals are true and correct, and incorporated into this Resolution.

2. In compliance with AB 361 (2021), and in order to continue to conduct teleconference meetings without complying with the usual teleconference meeting requirements of the Brown Act, the City Council makes the following findings:

   a) The City Council has considered the circumstances of the state of emergency; and

   b) The state of emergency, as declared by the Governor and City Council, and as specifically related to cases apparently resulting from the Omicron variant, directly

impacts the ability of the City Council and the City's legislative bodies, as well as staff and members of the public, to meet safely in person; and

c) The CDC continues to recommend physical distancing of at least six feet due to COVID-19 and as a result of the presence of COVID-19, meeting in person would present imminent risks to the health or safety of attendees, the legislative bodies and staff.

3. City staff is directed to facilitate any teleconference meetings, including hybrid meetings, of the City Council and City's legislative bodies in compliance with AB 361, in order to better ensure the health and safety of the public for a period of thirty days following the adoption of this resolution.

**PASSED, APPROVED, AND ADOPTED** this 10th day of January 2023 by the following vote:

**AYES:**

**NOES:**

**ABSENT:**

**ABSTAIN:**

_____

Mayor

**ATTEST:**

_____

City Clerk

Agenda Item 4.8

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Authorize the City Manager to Execute Parcel Map 10999 as Property Owner
*Prepared by: Kan Xu, Senior Civil Engineer*

### EXECUTIVE SUMMARY:

The City Council will consider authorizing the City Manager to execute Parcel Map 10999 as property owner to allow for the merger and subdivision of parcels for Don Biddle Community Park.

### STAFF RECOMMENDATION:

Adopt the **Resolution** Authorizing the City Manager to Execute the Owner's Statement of Parcel Map 10999 on Behalf of the City of Dublin.

### FINANCIAL IMPACT:

There is no impact on the General Fund. All Staff and consultant costs associated with the review of the parcel map are borne by the developer.

### DESCRIPTION:

Dublin Crossing, LLC (Developer) owns certain real property as part of the Boulevard development project (Project). The Project includes approximately 189 acres of land located north of Dublin Boulevard, west of Arnold Road, and east of Scarlett Drive. As part of the Project conditions of approval and Development Agreement, Developer was required to dedicate parkland to develop Don Biddle Community Park. The parkland was dedicated as separate parcels on Final Maps for Tracts 8368, 8382, and 8416, which were approved by the City Engineer.

Parcel Map 10999 (Attachment 2) will merge existing parcels and subdivide to create three new parcels and to dedicate public right-of-way required for Don Biddle Community Park, Scarlett Drive, and Horizon Parkway. Newly created Parcels A and C will be dedicated in fee to the City of Dublin for public park purposes subject to improvements. Parcel B, primarily Chabot Creek, is

reserved for future dedication to Alameda County Flood Control and Water Conservation District Zone 7 for flood control purposes by separate instrument.

Two existing parcels within the subdivision that are within the boundary of Parcel Map 10999 are owned in fee by the City of Dublin. The two parcels owned by the City are known as Assessor's Parcel Number 986-0001-003-02 and a portion of Dublin Boulevard right-of-way, as shown in Figure 1. The parcels are located at the southeast corner of Scarlett Drive and Horizon Parkway, and along Dublin Boulevard between Scarlett Drive and Columbus Street, respectively. Dublin Municipal Code 9.24.040(L) and Gov. Code section 66445(e), require a statement, signed, and acknowledged by all parties having any record title interest in the real property subdivided to consent to the preparation and recordation of the parcel map. To facilitate the subdivision, the City is required to be a signatory on the map. Staff recommends the City Council authorize the City Manager to execute Parcel Map 10999 to allow the merger and subdivision of parcels for Don Biddle Community Park.



Figure 1: Aerial photo showing two City owned properties. (Aerial dated 2020).

## STRATEGIC PLAN INITIATIVE:

None.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted.

ATTACHMENTS:

1) Resolution Authorizing the City Manager to Execute the Owner's Statement of Parcel Map 10999 on Behalf of the City of Dublin
2) Parcel Map 10999

**RESOLUTION NO. XX – 23**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DUBLIN**

**AUTHORIZING THE CITY MANAGER TO EXECUTE THE OWNER'S STATEMENT OF PARCEL MAP 10999 ON BEHALF OF THE CITY OF DUBLIN**

**WHEREAS,** Dublin Crossing, LLC (Developer) owns certain real property as part of the Boulevard development project; and

**WHEREAS,** the project conditions of approval and Development Agreement required Developer to dedicate parkland to develop the Don Biddle Community Park; and

**WHEREAS**, the parkland was dedicated as separate parcels on Final Maps for Tracts 8368, 8382, and 8416, which were approved by the City Engineer; and

**WHEREAS**, Parcel Map 10999 will merge existing parcels, create three new parcels, and dedicate public right-of-way required for Don Biddle Community Park, Scarlett Drive, and Horizon Parkway; and

**WHEREAS**, Parcels A and C of Parcel Map 10999 are dedicated in fee to the City of Dublin for public park purposes subject to improvement and Parcel B (Chabot Creek) of Parcel Map 10999 is reserved for future dedication to Alameda County Flood Control and Water Conservation District Zone 7 for flood control purposes by separate instrument; and

**WHEREAS**, the City of Dublin owns two existing parcels within the boundaries of Parcel Map 10999 in fee, including Assessor's Parcel No. 986-0001-003-02 and a portion of Dublin Boulevard right-of-way; and

**WHEREAS**, Dublin Municipal Code 9.24.040(L) and Gov. Code section 66445(e), require a statement, signed, and acknowledged by all parties having any record title interest in the real property subdivided to consent to the preparation and recordation of the parcel map; and

**WHEREAS**, the City of Dublin is required to be a signatory on Parcel Map 10999.

**NOW, THEREFORE, BE IT RESOLVED** that the City Manager is authorized to execute the Owner's Statement of Parcel Map 10999 on behalf of the City of Dublin.

{Signatures on the following page}

**PASSED, APPROVED AND ADOPTED** this 10th day of January 2023, by the following vote:

**AYES**:

**NOES**:

**ABSENT**:

**ABSTAIN**:

_____
Mayor

**ATTEST**:

_____
City Clerk

## OWNERS' STATEMENT

THE UNDERSIGNED DO HEREBY STATE THAT THEY ARE THE OWNERS OF ALL THE LANDS DELINEATED AND EMBRACED WITHIN THE TRACT BOUNDARY LINE OF THIS PARCEL MAP ENTITLED "PARCEL MAP 10999, CITY OF DUBLIN, ALAMEDA COUNTY, CALIFORNIA", CONSISTING OF FIVE (5) SHEETS, THIS STATEMENT BEING UPON SHEET ONE (1) THEREOF; THAT THEY CONSENT TO THE PREPARATION AND FILING OF SAID MAP; THAT SAID MAP PARTICULARLY SETS FORTH AND DESCRIBES ALL THE LOTS INTENDED FOR SALE BY THEIR NUMBER AND PRECISE WIDTH AND LENGTH; AND THAT SAID MAP PARTICULARLY SETS FORTH AND DESCRIBES THE PARCELS OF GROUND RESERVED FOR PUBLIC PURPOSES BY THEIR BOUNDARIES, COURSES, AND EXTENT.

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED IN FEE FOR PUBLIC PURPOSES: THOSE PORTIONS OF SAID LANDS DESIGNATED ON THIS MAP AS SCARLETT DRIVE AND HORIZON PARKWAY AS PUBLIC STREETS.

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED IN FEE FOR PUBLIC PURPOSES: PARCELS A AND C AS SHOWN UPON THIS MAP AS A PUBLIC PARK.

THE REAL PROPERTY DESCRIBED BELOW IS DEDICATED AS AN EASEMENT FOR PUBLIC PURPOSES: THE AREAS IN, UNDER, ALONG, AND ACROSS ANY AREA OR STRIP OF LAND DESIGNATED AS PUBLIC SERVICE EASEMENTS (PSE), AS DELINEATED AND EMBRACED WITHIN THE BOUNDARIES OF THE HEREIN EMBODIED MAP, DEDICATED TO THE CITY OF DUBLIN FOREVER FOR THE "PURPOSES OF PUBLIC SERVICES" (AS HEREIN DEFINED). THE "PURPOSES OF PUBLIC SERVICES" SHALL INCLUDE THE CONSTRUCTION, RECONSTRUCTION, REMOVING, REPLACING, REPAIRING, MAINTAINING, OPERATING, AND USING "PUBLIC SERVICE FACILITIES" (AS DEFINED HEREIN), AND ACCESS THROUGH THE PUBLIC SERVICE EASEMENT FOR THESE PURPOSES. "PUBLIC SERVICE FACILITIES" SHALL INCLUDE PUBLIC UTILITIES, FIRE HYDRANTS, ELECTROLIERS, IRRIGATION SYSTEMS, SIGNS AND TRAFFIC SIGNALS, AND ALL NECESSARY APPURTENANCES THERETO SUCH AS BRACES, CONNECTIONS, FASTENINGS, APPLIANCES, AND FIXTURES FOR USE IN CONNECTION THEREWITH. ALL PUBLIC SERVICE EASEMENTS SHALL BE KEPT OPEN AND FREE FROM BUILDINGS OR STRUCTURES OF ANY KIND, WITH THE SOLE EXCEPTION OF PUBLIC SERVICE FACILITIES. ALL PUBLIC SERVICE EASEMENTS SHALL BE CONSIDERED PUBLIC "WAYS" AS THAT TERM IS USED IN CALIFORNIA PUBLIC UTILITIES CODE SECTION 6202, AND ALL PUBLIC UTILITIES HOLDING A VALID FRANCHISE FROM THE CITY SHALL HAVE THE RIGHT TO USE THE PUBLIC SERVICE EASEMENTS IN ACCORDANCE WITH THE TERMS OF THE FRANCHISE.

THE REAL PROPERTY DESIGNATED AS "PARCEL B" IS HEREBY RESERVED FOR FUTURE DEDICATION, TO BE CONVEYED TO ZONE 7 OF THE ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT IN FEE BY SEPARATE INSTRUMENT SUBSEQUENT TO THE FILING OF THIS PARCEL MAP.

THIS MAP SHOWS ALL EASEMENTS ON THE PREMISES AND/OR OF RECORD, WITHIN THE BOUNDARY LINES OF THE HEREIN EMBODIED MAP.

AS OWNERS:

CITY OF DUBLIN

BY: _____

NAME: _____

TITLE: _____

DUBLIN CROSSING, LLC, A DELAWARE LIMITED LIABILITY COMPANY

BY: BROOKCAL DUBLIN LLC, A DELAWARE LIMITED LIABILITY COMPANY
ITS: MEMBER

BY: _____ BY: _____

NAME: _____ NAME: _____

TITLE: _____ TITLE: _____

BY: SPIC DUBLIN, LLC, A DELAWARE LIMITED LIABILITY COMPANY
ITS: MEMBER

BY: STANDARD PACIFIC INVESTMENT CORP., A DELAWARE CORPORATION
ITS: SOLE MEMBER

BY: _____ BY: _____

NAME: _____ NAME: _____

TITLE: _____ TITLE: _____

## OWNER'S ACKNOWLEDGEMENT

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY, OR VALIDITY OF THAT DOCUMENT.

STATE OF _____
COUNTY OF _____

ON _____, 2022, BEFORE ME, _____,
A NOTARY PUBLIC, PERSONALLY APPEARED _____
AND _____, WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/ SHE/ THEY EXECUTED THE SAME IN HIS/ HER/ THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS /HER /THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY ON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND,

SIGNATURE: _____

PRINT NAME: _____
NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE

MY COMMISSION NUMBER: _____

MY COMMISSION EXPIRES: _____

PRINCIPAL PLACE OF BUSINESS: _____

## OWNER'S ACKNOWLEDGEMENT

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY, OR VALIDITY OF THAT DOCUMENT.

STATE OF _____
COUNTY OF _____

ON _____, 2022, BEFORE ME, _____,
A NOTARY PUBLIC, PERSONALLY APPEARED _____
AND _____, WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/ SHE/ THEY EXECUTED THE SAME IN HIS/ HER/ THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS /HER /THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY ON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND,

SIGNATURE: _____

PRINT NAME: _____
NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE

MY COMMISSION NUMBER: _____

MY COMMISSION EXPIRES: _____

PRINCIPAL PLACE OF BUSINESS: _____

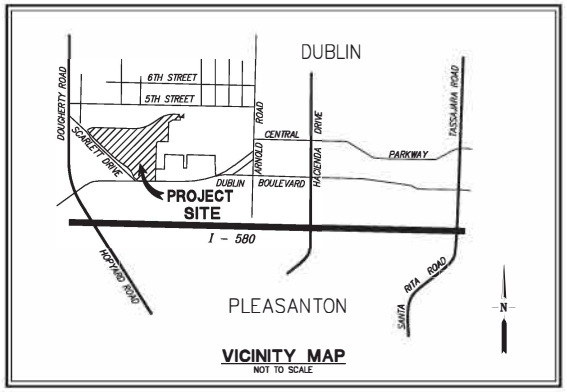
## COUNTY RECORDER'S STATEMENT

FILED FOR RECORD THIS ____ DAY OF _____, 2023, AT _____M., IN BOOK _____ OF MAPS AT PAGES _____ AT THE REQUEST OF FIRST AMERICAN TITLE COMPANY IN THE OFFICE OF THE COUNTY RECORDER OF ALAMEDA, STATE OF CALIFORNIA.

FEE: $_____ DOCUMENT NO. _____

MELISSA WILK
COUNTY RECORDER IN AND FOR THE
COUNTY OF ALAMEDA, STATE OF CALIFORNIA

BY: _____
DEPUTY COUNTY RECORDER




VICINITY MAP
NOT TO SCALE

## OWNER'S ACKNOWLEDGEMENT

A NOTARY PUBLIC OR OTHER OFFICER COMPLETING THIS CERTIFICATE VERIFIES ONLY THE IDENTITY OF THE INDIVIDUAL WHO SIGNED THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED, AND NOT THE TRUTHFULNESS, ACCURACY, OR VALIDITY OF THAT DOCUMENT.

STATE OF _____
COUNTY OF _____

ON _____, 2022, BEFORE ME, _____,
A NOTARY PUBLIC, PERSONALLY APPEARED _____
AND _____, WHO PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/ SHE/ THEY EXECUTED THE SAME IN HIS/ HER/ THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS /HER /THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY ON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND,

SIGNATURE: _____

PRINT NAME: _____
NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE

MY COMMISSION NUMBER: _____

MY COMMISSION EXPIRES: _____

PRINCIPAL PLACE OF BUSINESS: _____

# PARCEL MAP 10999

BEING A SUBDIVISION OF THE PARCEL DEEDED PER DOCUMENT NUMBERS 2017-068990 AND 1994-312570, PARCEL 4C PER DEED DOCUMENT NO. 2018-106891, PARCEL A AS SHOWN ON TRACT MAP 8415, FILED IN BOOK 357 OF MAPS AT PAGE 88, LOT 7 AS SHOWN ON TRACT MAP 8382, FILED IN BOOK 351 OF MAPS AT PAGE 60, AND PARCEL K AS SHOWN ON TRACT MAP 8368, FILED IN BOOK 357 OF MAPS AT PAGE 77, OFFICIAL RECORDS OF ALAMEDA COUNTY

CITY OF DUBLIN
ALAMEDA COUNTY, CALIFORNIA

RUGGERI-JENSEN-AZAR
CIVIL ENGINEERS, PLANNERS, SURVEYORS
PLEASANTON, CALIFORNIA
DECEMBER 2022

JOB NO. 081076PH2 SHEET 1 OF 5 SHEETS

I:\JOBS\081076\MAPPING\PARCEL MAP 10999\PARCEL MAP 10999.DWG 12/20/2022 4:08:14 PM ALAN WALTER

## SURVEYOR'S STATEMENT

THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS BASED UPON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCE AT THE REQUEST OF DUBLIN CROSSING, LLC IN NOVEMBER 2020. I HEREBY STATE THAT ALL THE MONUMENTS ARE OF THE CHARACTER AND OCCUPY THE POSITIONS INDICATED OR THAT THEY WILL BE SET IN THOSE POSITIONS BEFORE DECEMBER 2024, AND THAT THE MONUMENTS ARE, OR WILL BE, SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED, AND THAT THIS PARCEL MAP SUBSTANTIALLY CONFORMS TO THE CONDITIONALLY APPROVED TENTATIVE MAP, IF ANY.

LICENSED LAND SURVEYOR
SCOTT A. SHORTLIDGE
No. 6441
STATE OF CALIFORNIA

_____
SCOTT A. SHORTLIDGE, L.S. 6441 DATE

## ACTING CITY SURVEYOR'S STATEMENT

I HEREBY STATE THAT I HAVE EXAMINED THIS PARCEL MAP ENTITLED "PARCEL MAP 10999, CITY OF DUBLIN, ALAMEDA COUNTY, CALIFORNIA" AND I AM SATISFIED THAT THIS PARCEL MAP IS TECHNICALLY CORRECT.

LICENSED LAND SURVEYOR
DEAN A. JURADO
No. 9032
STATE OF CALIFORNIA

_____
DEAN A. JURADO, L.S. NO. 9032 DATE
ACTING CITY SURVEYOR, CITY OF DUBLIN

## CLERK OF THE BOARD OF SUPERVISORS STATEMENT

I, ANIKA CAMPBELL–BELTON, CLERK OF THE BOARD OF SUPERVISORS FOR THE COUNTY OF ALAMEDA, STATE OF CALIFORNIA, DO HEREBY STATE, AS CHECKED BELOW, THAT:

☐ AN APPROVED BOND HAS BEEN FILED WITH THE SUPERVISORS OF SAID COUNTY AND STATE IN THE AMOUNT OF $_____ CONDITIONED FOR THE PAYMENT OF ALL TAXES AND SPECIAL ASSESSMENTS COLLECTED AS TAXES, APPROVED BY SAID LOCAL BOARD IN SAID AMOUNT.

☐ ALL TAXES AND SPECIAL ASSESSMENTS COLLECTED AS TAXES HAVE BEEN PAID AS CERTIFIED BY THE TREASURER–TAX COLLECTOR OF THE COUNTY OF ALAMEDA.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND THIS _____ DAY OF _____, 2023.

_____
ANIKA CAMPBELL–BELTON
CLERK OF THE BOARD OF SUPERVISORS
COUNTY OF ALAMEDA
STATE OF CALIFORNIA

BY: _____
DEPUTY CLERK

## CITY ENGINEER'S STATEMENT

I, LAURIE L. SUCGANG, CITY ENGINEER OF THE CITY OF DUBLIN, COUNTY OF ALAMEDA, STATE OF CALIFORNIA, DO HEREBY STATE THAT I HAVE EXAMINED THE HEREIN EMBODIED PARCEL MAP ENTITLED "PARCEL MAP 10999, CITY OF DUBLIN, ALAMEDA COUNTY, CALIFORNIA", CONSISTING OF FIVE (5) SHEETS, THIS STATEMENT BEING UPON SHEET TWO (2) THEREOF, AND THAT THE PARCEL MAP WAS PRESENTED TO ME AS PROVIDED BY LOCAL ORDINANCE THIS _____ DAY OF _____, 2023, AND THAT THIS MAP CONFORMS WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCES APPLICABLE AT THE TIME OF APPROVAL OF THE VESTING TENTATIVE MAP AND THE SUBDIVISION AS SHOWN IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE VESTING TENTATIVE MAP AND ANY APPROVED ALTERATIONS THEREOF, AND THAT I APPROVE SAID MAP AND ACCEPT, SUBJECT TO IMPROVEMENT, ON BEHALF OF THE CITY OF DUBLIN, SCARLETT DRIVE, HORIZON PARKWAY, THE LAND DESIGNATED AS PARCELS A AND C (PUBLIC PARK), AND PUBLIC SERVICE EASEMENT (PSE), OFFERED FOR DEDICATION FOR PUBLIC USE IN CONFORMITY WITH THE TERMS OF THE OFFER OF DEDICATION.

I FURTHER STATE THAT ALL AGREEMENTS AND SURETY AS REQUIRED BY LAW TO ACCOMPANY THE WITHIN PARCEL MAP ARE APPROVED AND ARE FILED WITH THE CITY.

I FURTHER CERTIFY, IN ACCORDANCE WITH GOVERNMENT CODE SECTIONS 66445(J) AND 66499.20.2 OF THE SUBDIVISION MAP ACT, THE ABANDONMENT OF THE EASEMENTS LISTED ON SHEET 3 OF THIS MAP.

REGISTERED PROFESSIONAL ENGINEER
LAURIE L. SUCGANG
No. 73022
CIVIL
STATE OF CALIFORNIA

_____
LAURIE L. SUCGANG, CITY ENGINEER DATE
R.C.E. 73022
CITY OF DUBLIN, ALAMEDA COUNTY, CALIFORNIA

## SOIL REPORT

A GEOTECHNICAL INVESTIGATION AND REPORT DATED OCTOBER 31, 2018 PROJECT NO. 3761.109 WAS PREPARED BY BERLOGAR STEVENS & ASSOCIATES, AND FILED WITH THE CITY OF DUBLIN, CALIFORNIA.

## SIGNATURE OMISSIONS:

PURSUANT TO SECTION 66445(e) OF THE CALIFORNIA SUBDIVISION MAP ACT, THE SIGNATURES OF PARTIES OWNING THE FOLLOWING INTERESTS, WHICH CANNOT RIPEN INTO A FEE, HAVE BEEN OMITTED:

1. ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT EASEMENT PER REEL 3335, IMAGE 90 OFFICIAL RECORDS AND 2018–200597.
2. UNITED STATES OF AMERICA – ACCESS AND INCIDENTAL EASEMENTS PER 2014–064105, 2017–064517, 2017–241771, 2018–106890, AND 2018–106891.
3. PACIFIC GAS AND ELECTRIC – GAS AND ELECTRIC EASEMENTS PER 1972–154460 (RE 3276 IM 82).
4. SANTA FE PACIFIC PIPELINES, INC – PIPELINE EASEMENTS PER RE 2628 IM 802, 1994–355330, AND 1995–020381.

# PARCEL MAP 10999

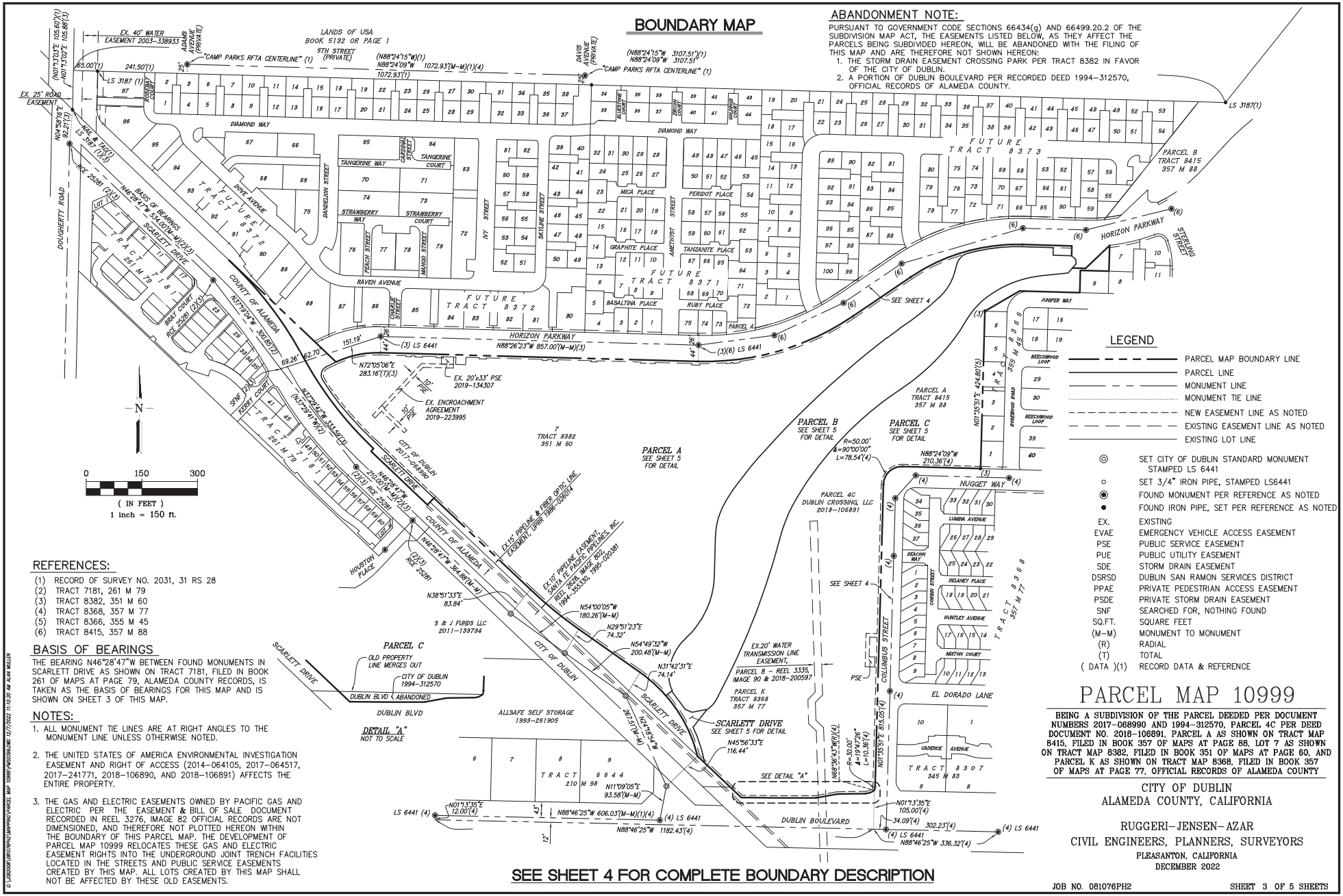
BEING A SUBDIVISION OF THE PARCEL DEEDED PER DOCUMENT NUMBERS 2017–068990 AND 1994–312570, PARCEL 4C PER DEED DOCUMENT NO. 2018–106891, PARCEL A AS SHOWN ON TRACT MAP 8415, FILED IN BOOK 357 OF MAPS AT PAGE 88, LOT 7 AS SHOWN ON TRACT MAP 8382, FILED IN BOOK 351 OF MAPS AT PAGE 60, AND PARCEL K AS SHOWN ON TRACT MAP 8368, FILED IN BOOK 357 OF MAPS AT PAGE 77, OFFICIAL RECORDS OF ALAMEDA COUNTY

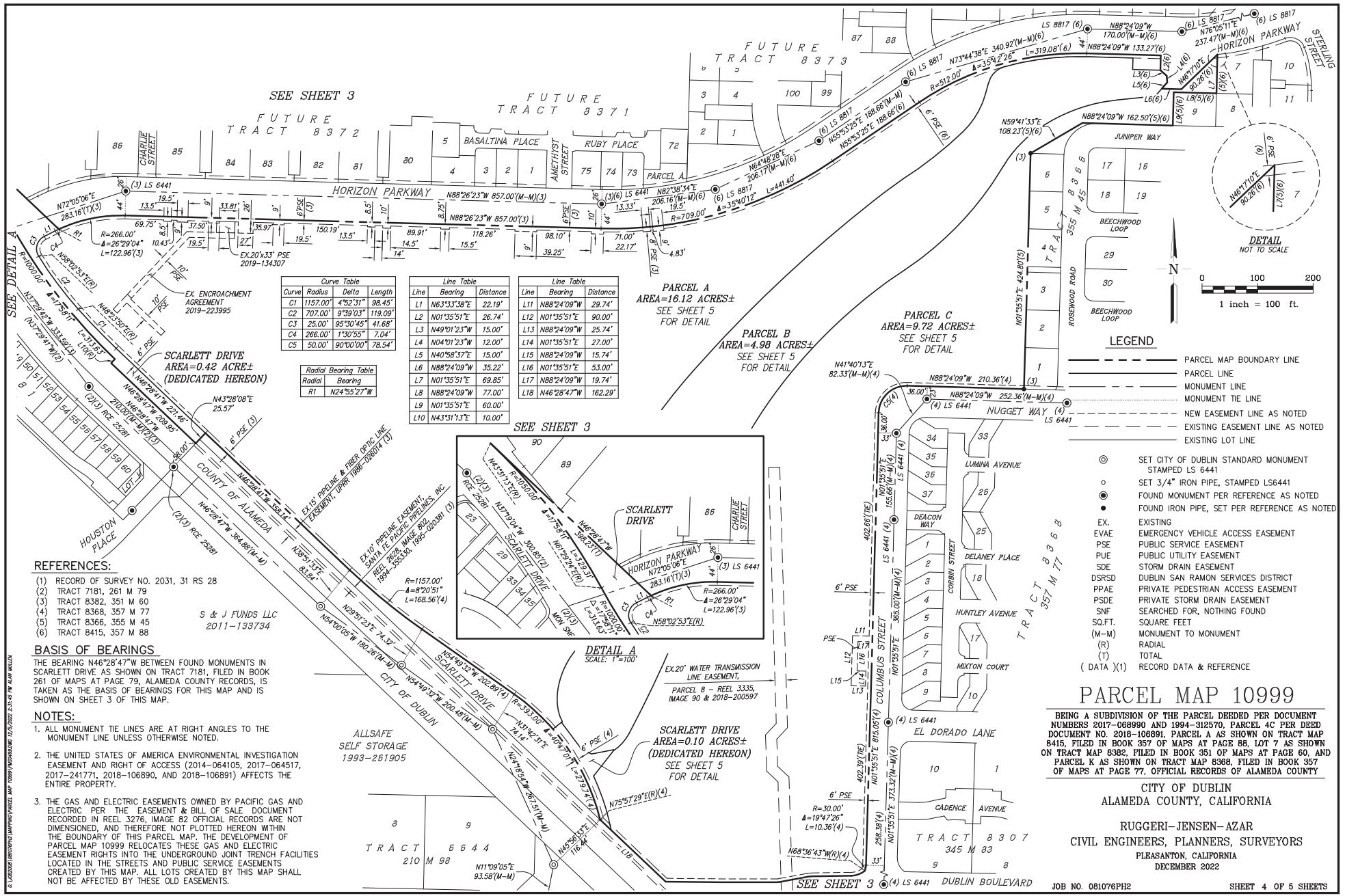
CITY OF DUBLIN
ALAMEDA COUNTY, CALIFORNIA

RUGGERI–JENSEN–AZAR
CIVIL ENGINEERS, PLANNERS, SURVEYORS
PLEASANTON, CALIFORNIA
DECEMBER 2022

JOB NO. 081076PH2 SHEET 2 OF 5 SHEETS

C:\JOBS\081076PH2\MAPPING\PARCEL MAP 10999\PM10999SHEET2.DWG 12/20/2022 4:51:19 PM ALAN MULLEN


BOUNDARY MAP
ABANDONMENT NOTE:
PURSUANT TO GOVERNMENT CODE SECTIONS 66434(g) AND 66499.20.2 OF THE SUBDIVISION MAP ACT, THE EASEMENTS LISTED BELOW, AS THEY AFFECT THE PARCELS BEING SUBDIVIDED HEREON, WILL BE ABANDONED WITH THE FILING OF THIS MAP AND ARE THEREFORE NOT SHOWN HEREON:
1. THE STORM DRAIN EASEMENT CROSSING PARK PER TRACT 8382 IN FAVOR OF THE CITY OF DUBLIN.
2. A PORTION OF DUBLIN BOULEVARD PER RECORDED DEED 1994-312570, OFFICIAL RECORDS OF ALAMEDA COUNTY.
LEGEND
PARCEL MAP BOUNDARY LINE
PARCEL LINE
MONUMENT LINE
MONUMENT TIE LINE
NEW EASEMENT LINE AS NOTED
EXISTING EASEMENT LINE AS NOTED
EXISTING LOT LINE
SET CITY OF DUBLIN STANDARD MONUMENT STAMPED LS 6441
SET 3/4" IRON PIPE, STAMPED LS6441
FOUND MONUMENT PER REFERENCE AS NOTED
FOUND IRON PIPE, SET PER REFERENCE AS NOTED
EX. EXISTING
EVAE EMERGENCY VEHICLE ACCESS EASEMENT
PSE PUBLIC SERVICE EASEMENT
PUE PUBLIC UTILITY EASEMENT
SDE STORM DRAIN EASEMENT
DSRSD DUBLIN SAN RAMON SERVICES DISTRICT
PPAE PRIVATE PEDESTRIAN ACCESS EASEMENT
PSDE PRIVATE STORM DRAIN EASEMENT
SNF SEARCHED FOR, NOTHING FOUND
SQ.FT. SQUARE FEET
(M-M) MONUMENT TO MONUMENT
(R) RADIAL
(T) TOTAL
( DATA )(1) RECORD DATA & REFERENCE
0 150 300
( IN FEET )
1 inch = 150 ft.
REFERENCES:
(1) RECORD OF SURVEY NO. 2031, 31 RS 28
(2) TRACT 7181, 261 M 79
(3) TRACT 8382, 351 M 60
(4) TRACT 8368, 357 M 77
(5) TRACT 8366, 355 M 45
(6) TRACT 8415, 357 M 88
BASIS OF BEARINGS
THE BEARING N46°28'47"W BETWEEN FOUND MONUMENTS IN SCARLETT DRIVE AS SHOWN ON TRACT 7181, FILED IN BOOK 261 OF MAPS AT PAGE 79, ALAMEDA COUNTY RECORDS, IS TAKEN AS THE BASIS OF BEARINGS FOR THIS MAP AND IS SHOWN ON SHEET 3 OF THIS MAP.
NOTES:
1. ALL MONUMENT TIE LINES ARE AT RIGHT ANGLES TO THE MONUMENT LINE UNLESS OTHERWISE NOTED.
2. THE UNITED STATES OF AMERICA ENVIRONMENTAL INVESTIGATION EASEMENT AND RIGHT OF ACCESS (2014-064105, 2017-064517, 2017-241771, 2018-106890, AND 2018-106891) AFFECTS THE ENTIRE PROPERTY.
3. THE GAS AND ELECTRIC EASEMENTS OWNED BY PACIFIC GAS AND ELECTRIC PER THE EASEMENT & BILL OF SALE DOCUMENT RECORDED IN REEL 3276, IMAGE 82 OFFICIAL RECORDS ARE NOT DIMENSIONED, AND THEREFORE NOT PLOTTED HEREON WITHIN THE BOUNDARY OF THIS PARCEL MAP. THE DEVELOPMENT OF PARCEL MAP 10999 RELOCATES THESE GAS AND ELECTRIC EASEMENT RIGHTS INTO THE UNDERGROUND JOINT TRENCH FACILITIES LOCATED IN THE STREETS AND PUBLIC SERVICE EASEMENTS CREATED BY THIS MAP. ALL LOTS CREATED BY THIS MAP SHALL NOT BE AFFECTED BY THESE OLD EASEMENTS.
SEE SHEET 4 FOR COMPLETE BOUNDARY DESCRIPTION
PARCEL MAP 10999
BEING A SUBDIVISION OF THE PARCEL DEEDED PER DOCUMENT NUMBERS 2017-068990 AND 1994-312570, PARCEL 4C PER DEED DOCUMENT NO. 2018-106891, PARCEL A AS SHOWN ON TRACT MAP 8415, FILED IN BOOK 357 OF MAPS AT PAGE 88, LOT 7 AS SHOWN ON TRACT MAP 8382, FILED IN BOOK 351 OF MAPS AT PAGE 60, AND PARCEL K AS SHOWN ON TRACT MAP 8368, FILED IN BOOK 357 OF MAPS AT PAGE 77, OFFICIAL RECORDS OF ALAMEDA COUNTY
CITY OF DUBLIN
ALAMEDA COUNTY, CALIFORNIA
RUGGERI-JENSEN-AZAR
CIVIL ENGINEERS, PLANNERS, SURVEYORS
PLEASANTON, CALIFORNIA
DECEMBER 2022
JOB NO. 081076PH2
SHEET 3 OF 5 SHEETS




| Curve Table | | | |
|---|---|---|---|
| Curve | Radius | Delta | Length |
| C1 | 1157.00' | 4°52'31" | 98.45' |
| C2 | 707.00' | 9°39'03" | 119.09' |
| C3 | 25.00' | 95°30'45" | 41.68' |
| C4 | 266.00' | 1°30'55" | 7.04' |
| C5 | 50.00' | 90°00'00" | 78.54' |

| Radial Bearing Table | |
|---|---|
| Radial | Bearing |
| R1 | N24°55'27"W |

| Line Table | | |
|---|---|---|
| Line | Bearing | Distance |
| L1 | N63°33'38"E | 22.19' |
| L2 | N01°35'51"E | 26.74' |
| L3 | N49°01'23"W | 15.00' |
| L4 | N04°01'23"W | 12.00' |
| L5 | N40°58'37"E | 15.00' |
| L6 | N88°24'09"W | 35.22' |
| L7 | N01°35'51"E | 69.85' |
| L8 | N88°24'09"W | 77.00' |
| L9 | N01°35'51"E | 60.00' |
| L10 | N43°31'13"E | 10.00' |

| Line Table | | |
|---|---|---|
| Line | Bearing | Distance |
| L11 | N88°24'09"W | 29.74' |
| L12 | N01°35'51"E | 90.00' |
| L13 | N88°24'09"W | 25.74' |
| L14 | N01°35'51"E | 27.00' |
| L15 | N88°24'09"W | 15.74' |
| L16 | N01°35'51"E | 53.00' |
| L17 | N88°24'09"W | 19.74' |
| L18 | N46°28'47"W | 162.29' |

## LEGEND

- PARCEL MAP BOUNDARY LINE
- PARCEL LINE
- MONUMENT LINE
- MONUMENT TIE LINE
- NEW EASEMENT LINE AS NOTED
- EXISTING EASEMENT LINE AS NOTED
- EXISTING LOT LINE

- SET CITY OF DUBLIN STANDARD MONUMENT STAMPED LS 6441
- SET 3/4" IRON PIPE, STAMPED LS6441
- FOUND MONUMENT PER REFERENCE AS NOTED
- FOUND IRON PIPE, SET PER REFERENCE AS NOTED

| | |
|---|---|
| EX. | EXISTING |
| EVAE | EMERGENCY VEHICLE ACCESS EASEMENT |
| PSE | PUBLIC SERVICE EASEMENT |
| PUE | PUBLIC UTILITY EASEMENT |
| SDE | STORM DRAIN EASEMENT |
| DSRSD | DUBLIN SAN RAMON SERVICES DISTRICT |
| PPAE | PRIVATE PEDESTRIAN ACCESS EASEMENT |
| PSDE | PRIVATE STORM DRAIN EASEMENT |
| SNF | SEARCHED FOR, NOTHING FOUND |
| SQ.FT. | SQUARE FEET |
| (M-M) | MONUMENT TO MONUMENT |
| (R) | RADIAL |
| (T) | TOTAL |
| ( DATA )(1) | RECORD DATA & REFERENCE |

## REFERENCES:

(1) RECORD OF SURVEY NO. 2031, 31 RS 28
(2) TRACT 7181, 261 M 79
(3) TRACT 8382, 351 M 60
(4) TRACT 8368, 357 M 77
(5) TRACT 8366, 355 M 45
(6) TRACT 8415, 357 M 88

## BASIS OF BEARINGS

THE BEARING N46°28'47"W BETWEEN FOUND MONUMENTS IN SCARLETT DRIVE AS SHOWN ON TRACT 7181, FILED IN BOOK 261 OF MAPS AT PAGE 79, ALAMEDA COUNTY RECORDS, IS TAKEN AS THE BASIS OF BEARINGS FOR THIS MAP AND IS SHOWN ON SHEET 3 OF THIS MAP.

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# PARCEL MAP 10999

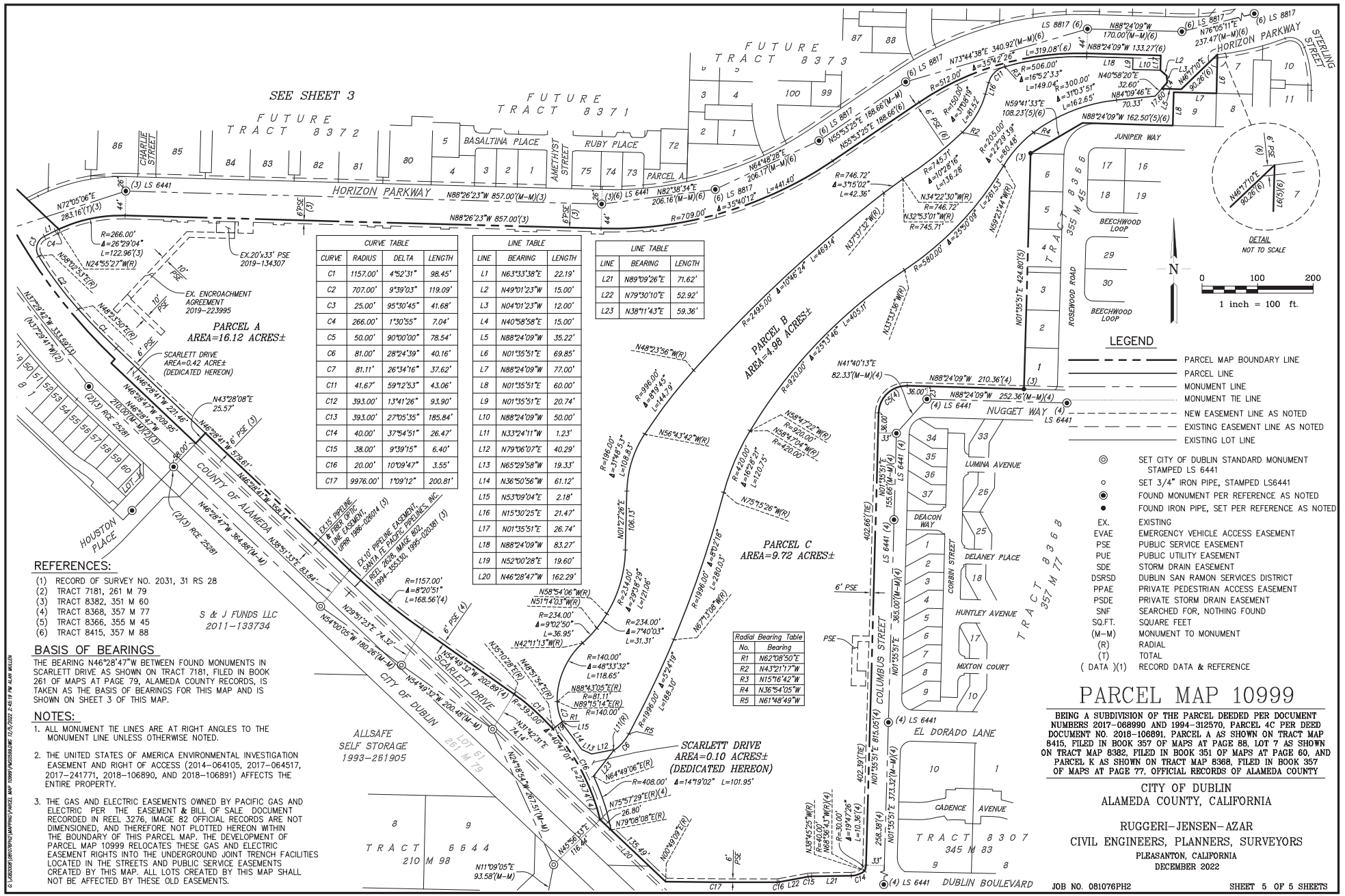
BEING A SUBDIVISION OF THE PARCEL DEEDED PER DOCUMENT NUMBERS 2017-068990 AND 1994-312570, PARCEL 4C PER DEED DOCUMENT NO. 2018-106891, PARCEL A AS SHOWN ON TRACT MAP 8415, FILED IN BOOK 357 OF MAPS AT PAGE 88, LOT 7 AS SHOWN ON TRACT MAP 8382, FILED IN BOOK 351 OF MAPS AT PAGE 60, AND PARCEL K AS SHOWN ON TRACT MAP 8368, FILED IN BOOK 357 OF MAPS AT PAGE 77, OFFICIAL RECORDS OF ALAMEDA COUNTY

CITY OF DUBLIN
ALAMEDA COUNTY, CALIFORNIA

RUGGERI-JENSEN-AZAR
CIVIL ENGINEERS, PLANNERS, SURVEYORS
PLEASANTON, CALIFORNIA
DECEMBER 2022

JOB NO. 081076PH2

SHEET 4 OF 5 SHEETS




| CURVE TABLE | | | |
|---|---|---|---|
| CURVE | RADIUS | DELTA | LENGTH |
| C1 | 1157.00' | 4°52'31" | 98.45' |
| C2 | 707.00' | 9°39'03" | 119.09' |
| C3 | 25.00' | 95°30'45" | 41.68' |
| C4 | 266.00' | 1°30'55" | 7.04' |
| C5 | 50.00' | 90°00'00" | 78.54' |
| C6 | 81.00' | 28°24'39" | 40.16' |
| C7 | 81.11' | 26°34'16" | 37.62' |
| C11 | 41.67' | 59°12'53" | 43.06' |
| C12 | 393.00' | 13°41'26" | 93.90' |
| C13 | 393.00' | 27°05'35" | 185.84' |
| C14 | 40.00' | 37°54'51" | 26.47' |
| C15 | 38.00' | 9°39'15" | 6.40' |
| C16 | 20.00' | 10°09'47" | 3.55' |
| C17 | 9976.00' | 1°09'12" | 200.81' |

| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | LENGTH |
| L1 | N63°33'38"E | 22.19' |
| L2 | N49°01'23"W | 15.00' |
| L3 | N04°01'23"W | 12.00' |
| L4 | N40°58'58"E | 15.00' |
| L5 | N88°24'09"W | 35.22' |
| L6 | N01°35'51"E | 69.85' |
| L7 | N88°24'09"W | 77.00' |
| L8 | N01°35'51"E | 60.00' |
| L9 | N01°35'51"E | 20.74' |
| L10 | N88°24'09"W | 50.00' |
| L11 | N33°24'11"W | 1.23' |
| L12 | N79°06'07"E | 40.29' |
| L13 | N65°29'58"W | 19.33' |
| L14 | N36°50'56"W | 61.12' |
| L15 | N53°09'04"E | 2.18' |
| L16 | N15°30'25"E | 21.47' |
| L17 | N01°35'51"E | 26.74' |
| L18 | N88°24'09"W | 83.27' |
| L19 | N52°00'28"E | 19.60' |
| L20 | N46°28'47"W | 162.29' |

| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | LENGTH |
| L21 | N89°09'26"E | 71.62' |
| L22 | N79°30'10"E | 52.92' |
| L23 | N38°11'43"E | 59.36' |

| Radial Bearing Table | |
|---|---|
| No. | Bearing |
| R1 | N62°08'50"E |
| R2 | N43°21'17"W |
| R3 | N15°16'42"W |
| R4 | N36°54'05"W |
| R5 | N61°48'49"W |

## REFERENCES:

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(2) TRACT 7181, 261 M 79
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## LEGEND

- PARCEL MAP BOUNDARY LINE
- PARCEL LINE
- MONUMENT LINE
- MONUMENT TIE LINE
- NEW EASEMENT LINE AS NOTED
- EXISTING EASEMENT LINE AS NOTED
- EXISTING LOT LINE

- ◎ SET CITY OF DUBLIN STANDARD MONUMENT STAMPED LS 6441
- ○ SET 3/4" IRON PIPE, STAMPED LS6441
- ◉ FOUND MONUMENT PER REFERENCE AS NOTED
- ● FOUND IRON PIPE, SET PER REFERENCE AS NOTED

| | |
|---|---|
| EX. | EXISTING |
| EVAE | EMERGENCY VEHICLE ACCESS EASEMENT |
| PSE | PUBLIC SERVICE EASEMENT |
| PUE | PUBLIC UTILITY EASEMENT |
| SDE | STORM DRAIN EASEMENT |
| DSRSD | DUBLIN SAN RAMON SERVICES DISTRICT |
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CITY OF DUBLIN
ALAMEDA COUNTY, CALIFORNIA

RUGGERI-JENSEN-AZAR
CIVIL ENGINEERS, PLANNERS, SURVEYORS
PLEASANTON, CALIFORNIA
DECEMBER 2022

JOB NO. 081076PH2 SHEET 5 OF 5 SHEETS

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Agenda Item 4.9

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Annual Proclamation
*Prepared by: Cierra Fabrigas, Executive Aide*

### EXECUTIVE SUMMARY:

The City Council will review the Official Proclamation List and consider approval of the Annual Proclamation.

### STAFF RECOMMENDATION:

Accept the Official Proclamation List and approve the Annual Proclamation.

### FINANCIAL IMPACT:

None.

### DESCRIPTION:

At its meeting on September 20, 2022, the City Council reviewed the Official List of Proclamations and the proclamation process. The City Council approved the List and the process, with the request that the List be re-approved each January with the adoption of the Annual Proclamation.

Attached is the List for 2023, updated with any proclamations not previously included but found on the Federal Register. Staff asks that the City Council accept this as the new City of Dublin Official Proclamation List and approve the Annual Proclamation.

### STRATEGIC PLAN INITIATIVE:

None.

### NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The City Council Agenda was posted.

ATTACHMENTS:

1) Official List of Proclamations
2) City of Dublin Annual Proclamation

**City of Dublin**
**Official List of Proclamations (2023)**

---

**January**
Mentoring Month
Stalking Awareness Month
Slavery and Human Trafficking Prevention Month

**February**
Teen Dating Violence Awareness and Prevention Month
African American History Month/ Black History Month
American Heart Month
Career and Technical Education Month
Lunar New Year

**March**
Women's History Month
Irish-American Heritage Month
Colorectal Cancer Awareness Month
American Red Cross Month
Meals on Wheels
Disabilities Awareness Month

**April**
Arbor Day
Bike Month and Bike to Work Day
Sexual Assault Awareness and Prevention Month
Donate Life Month
Cancer Month
Financial Capability Month
Child Abuse Prevention Month
Second Chance Month
Fair Housing Month
Crime Victims' Rights Month
Month of the Military Child

**May**
Small Business Week
Public Works Week
Affordable Housing Week
Lupus Awareness Month
Mental Health Awareness Month
Physical Fitness and Sports Month
Building Safety Month
Foster Care Month
Older Americans Month
Jewish American Heritage Month
Asian American and Pacific Islander Heritage Month
Correctional Workers Week
Job's Daughters International Day
Municipal Clerk's Week

**June**
LGBTQ+ Pride Month and Flag Raising
Flag Day and National Flag Week
National Oceans Month
Carribbean-American Heritage Month
Homeownership Month
Great Outdoors Month
African American Music Appreciation Month
Juneteenth
Gun Violence Awareness Day and Month
World Elder Abuse Month
Immigrant Heritage Month

**July**
Pledge to America's Workers Month

**August**
National Night Out
American Muslim Appreciation and Awareness Month

**September**
Suicide Prevention Awareness Month
Hispanic Heritage Month
Childhood Cancer Awareness Month
Wilderness Month
Prostate Cancer Awareness Month
Preparedness Month
Ovarian Cancer Awareness Month
Childhood Obesity Awareness Month
Recovery Month
Constitution Week
Sickle Cell Awareness Month

**October**
Walk and Roll to School
Fire Prevention Week
Red Ribbon Week
Bullying Prevention Month & Unity Day
Energy Action Month
Breast Cancer Awareness Month
Domestic Violence Awareness Month
Youth Justice Awareness Month
Disability Employment Awareness Month
Cybersecurity Awareness Month
Arts and Humanities Month
Global Diversity Awareness Month
Manufacturing Day
Children's Environmental Health Month
Diwali
Hindu American Awareness and Appreciation Month
Clean Energy Action Month
Substance Abuse Awareness Month

**November**

Native American Heritage Month
Family Caregivers Month
Diabetes Month
Entrepreneurship Month
Critical Infrastructure Security and Resilience Month
College Application Month
Alzheimer's Disease Awareness Month
Adoption Month
Veterans and Military Families Month
United Against Hate - Oral Communications
American History and Founders Month
Lung Cancer Awareness Month

**December**
Impaired Driving Prevention Month

**Total Proclamations - 95**

# *A PROCLAMATION OF THE CITY OF DUBLIN, CALIFORNIA*

*"Annual Proclamation 2023"*

*WHEREAS, the City of Dublin wishes to recognize organizations within the City by publicly and formally declaring notable occasions by the issuance of proclamations; and*

*WHEREAS, at its September 20, 2022 meeting, the City Council adopted an Official List of Proclamations for the City of Dublin; and*

*WHEREAS, the City of Dublin invites organizations to ceremonially receive proclamations throughout the year; and*

*WHEREAS, the City of Dublin promotes and supports a high quality of life, ensures a safe and secure environment, fosters new opportunities, provides equity across all programs, and champions a culture of diversity and inclusion.*

*NOW, THEREFORE, BE IT RESOLVED in support of the City of Dublin mission, the Dublin City Council does hereby proclaim the following in 2023 throughout the City of Dublin:*

January
Mentoring Month
Stalking Awareness Month
Slavery and Human Trafficking Prevention Month

February
Teen Dating Violence Awareness and Prevention Month
African American History Month/ Black History Month
American Heart Month
Career and Technical Education Month
Lunar New Year

March
Women's History Month
Irish-American Heritage Month
Colorectal Cancer Awareness Month
American Red Cross Month
Meals on Wheels

April
Arbor Day
Bike Month and Bike to Work Day
Sexual Assault Awareness and Prevention Month
Donate Life Month
Cancer Month
Financial Capability Month
Child Abuse Prevention Month
Second Chance Month
Fair Housing Month
Crime Victims' Rights Month
Month of the Military Child

May
Small Business Week
Public Works Week
Affordable Housing Week
Lupus Awareness Month
Mental Health Awareness Month
Physical Fitness and Sports Month
Building Safety Month
Foster Care Month
Older Americans Month
Jewish American Heritage Month
Asian American and Pacific Islander Heritage Month
Correctional Workers Week
Job's Daughters International Day
Municipal Clerk's Week

June
LGBTQ+ Pride Month and Flag Raising
Flag Day and National Flag Week
National Oceans Month
Caribbean-American Heritage Month
Homeownership Month
Great Outdoors Month
African American Music Appreciation Month
Juneteenth
Gun Violence Awareness Day and Month
World Elder Abuse Month
Immigrant Heritage Month

July
Pledge to America's Workers Month

August
National Night Out
American Muslim Appreciation and Awareness Month

September
Suicide Prevention Awareness Month
Hispanic Heritage Month
Childhood Cancer Awareness Month
Wilderness Month
Prostate Cancer Awareness Month
Preparedness Month
Ovarian Cancer Awareness Month
Childhood Obesity Awareness Month
Recovery Month
Constitution Week
Sickle Cell Awareness Month

October
Walk and Roll to School
Fire Prevention Week
Red Ribbon Week
Bullying Prevention Month & Unity Day
Energy Action Month
Breast Cancer Awareness Month
Domestic Violence Awareness Month
Youth Justice Awareness Month
Disability Employment Awareness Month
Cybersecurity Awareness Month
Arts and Humanities Month
Global Diversity Awareness Month
Manufacturing Day
Children's Environmental Health Month
Diwali
Hindu American Awareness and Appreciation Month
Clean Energy Action Month
Substance Abuse Awareness Month

November
Native American Heritage Month
Family Caregivers Month
Diabetes Month
Entrepreneurship Month
Critical Infrastructure Security and Resilience Month
College Application Month
Alzheimer's Disease Awareness Month
Adoption Month
Veterans and Military Families Month
United Against Hate
American History and Founders Month
Lung Cancer Awareness Month

December
Impaired Driving Prevention Month

Mayor Melissa Hernandez

Vice Mayor Michael McCorriston

Councilmember Sherry Hu

Councilmember Jean Josey

Councilmember Kashef Qaadri

Agenda Item 6.1

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Bicycle and Pedestrian Plan Update
*Prepared by: Sai Midididdi, Associate Civil Engineer (Traffic)*

## EXECUTIVE SUMMARY:

The City Council will hold a public hearing to review and consider adopting the proposed update to the City's Bicycle and Pedestrian Plan. This includes an exemption from review under the California Environmental Quality Act. The proposed Plan updates and replaces the 2014 Bicycle and Pedestrian Master Plan and will inform future infrastructure, program, and policy recommendations.

## STAFF RECOMMENDATION:

Conduct the public hearing, deliberate, and adopt the **Resolution** Adopting the Bicycle and Pedestrian Plan and Finding the Plan Exempt From the California Environmental Quality Act.

## FINANCIAL IMPACT:

All Staff costs and consultant costs associated with the preparation of the Bicycle and Pedestrian Plan are funded in the approved 2022-2027 Capital Improvement Program (CIP) project, Citywide Bicycle and Pedestrian Improvements, CIP No. ST0517. The City received $210,000 in funding from the Transportation Development Act Article Three funds to assist with the preparation of the Plan.

Any improvement projects implementing the proposed recommendations in the Plan will also be covered under the approved CIP No. ST0517 or will be brought forward to the City Council with a recommendation for funding.

## DESCRIPTION:

Background

The Bicycle and Pedestrian Plan is a critical planning, policy, and implementation document that supports the City's efforts to improve the safety and attractiveness of biking and walking as a means of transportation and recreation. The Plan includes an assessment of existing system conditions through an inventory of infrastructure, programs, and policies related to biking and walking, analysis of bicycle level of traffic stress, evaluation of collision data, estimation of bicycle and pedestrian access and demand, and public input. The updated Plan results in a recommended biking and walking network and a prioritized list of projects to support biking and walking in Dublin. This Plan replaces the City's 2014 Bicycle and Pedestrian Master Plan.

Summary of the Bicycle and Pedestrian Plan Update

Key sections and recommendations of the Plan are summarized in the sections below.

### *Community Engagement*

The community engagement effort included the following virtual and in-person activities:

- *Project Website and Interactive Map*. The project website, accessed at https://dublinbikeped.org/, provides information about the Plan, including the project timeline, engagement activities, and summaries of technical analyses, along with an interactive map that allows respondents to provide geographic input on key issues and opportunity locations for biking and walking throughout Dublin. Since going live in March 2020, the website received approximately 1,500 visits and almost 300 unique comments were posted on the map.
- *Public Workshop*. A virtual public workshop was held on September 2, 2020 with approximately 45 members of the public in attendance. The meeting included a presentation, live polls, and a question-and-answer period. The meeting was recorded and is available on the project website.
- *Public Survey*. A public survey was used to collect information from the public about their personal transportation preferences, travel habits, and issues and opportunities related to biking and walking in Dublin. The 17-question survey was distributed in summer 2020 and received almost 200 responses about travel behavior and mode preference, travel to school, challenges, barriers to access and mobility, and priorities for investments related to biking and walking.
- *In-Person Events*. The project team participated in three in-person events as public health guidance due to the COVID-19 pandemic allowed. Flyers with the public survey link were handed out at the Farmers' Market on May 27, 2021, and people were rewarded with giveaways for participation. The City partnered with Bike East Bay to hear from trail users at the Alamo Creek Trailhead as a part of the National Bike Month Activities in 2021. Draft network recommendations were shared at the St. Patrick's Day Festival in 2022.

*Plan Vision*

The City of Dublin is a vibrant place where walking and biking are safe, comfortable, and convenient ways to travel and connect individuals, inclusive of all ages and abilities, to local and regional destinations.

*Plan Goals*

- *Enhance Safety.* Prioritize safety in design and implementation of biking and walking facilities.
- *Increase Biking and Walking.* Support biking and walking as attractive modes of transportation.
- *Improve Connectivity*. Develop a bicycle and pedestrian network that provides well-connected facilities for users of all ages and abilities.
- *Enhance Accessibility*. Utilize principles of universal design to make biking and walking a viable transportation option for all, including people with disabilities.
- *Prioritize Investments*. Maintain sufficient funding to provide for existing and future bicycle and pedestrian needs, including supporting programs and operation and maintenance. Leverage biking and walking projects to promote economic activity and social equity outcomes among people of all ages and abilities.

*Existing Conditions and Needs Analysis*

The existing conditions and needs analyses were conducted to set the foundation for the policy recommendations and provide the technical analysis to support the development of the prioritization framework and implementation strategy. This analysis covered:

- *Program and Policy Inventory*. The project team reviewed bike- and pedestrian-related programs and policies from relevant planning documents and conducted benchmarking interviews with staff from seven City departments and the Dublin Unified School District to develop an updated inventory of existing programs and policies relevant to biking and walking and identify gaps or needs that could be addressed by the Plan.
- *Land Use and Demographic Analysis*. The project team gathered and summarized land use and demographic data to provide background and context to inform the Plan development, including the demand analysis and prioritization.
- *Collision Analysis*. The project team analyzed reported collision data from the six most recently available years (2014-2019) involving bicyclists and pedestrians. A citywide analysis was conducted to identify corridors and locations with the highest concentration of pedestrian and bicycle collisions. These corridors are called high injury networks (HINs) (Figure 25, page 64 and Figure 26, page 65 of the Plan, provided as Attachment 3). The collision data was further analyzed to identify any citywide trends based on temporal characteristics, lighting conditions, location characteristics (intersection versus segment), main cause of the collision, age, and gender.
- *Bicycle Level of Traffic Stress (LTS) Analysis*. The project team analyzed the bicyclist level of traffic stress (LTS) on the City's existing roadway network ("on-street LTS") and on the

Class I path, or the shared–use path network ("path LTS") with exclusive right of way for bicyclists and pedestrians away from the roadway like the Iron Horse Regional Trail. Bicycle LTS methodology considers various roadway characteristics such as the number of vehicle travel lanes, speed of vehicle traffic, and presence and width of a bike facility to measure the stress a bicyclist feels while riding on a given facility. The goal of planning and designing a bicycle network is to enable people of all ages and abilities to feel safe and comfortable riding bicycles throughout the City. These LTS findings are useful for identifying high stress locations where installation of, or upgrades to, bicycle infrastructure would increase bicyclists' comfort and safety.

- *Pedestrian Barriers Analysis*. Sidewalk gaps and lack of safe crossing opportunities can create barriers to walking by requiring people to go out of their way to avoid the gap or by forcing people to walk in the street and increase exposure to vehicle traffic. The project team identified and mapped existing barriers to a safe and comfortable walking network in Dublin, including major arterials and freeways with high vehicle speeds and volumes, gaps in the sidewalk network, and locations with long crossing distances and limited street connectivity. The barriers analysis was used as one input into the Access and Demand Analysis.
- *Access and Demand Analysis*. The ability of people to walk or bike to key destinations was analyzed to estimate existing access to key destinations. The output from the land use and demographic analysis, collision analysis, barrier analysis, and bicycle LTS analysis were key inputs to estimate the share of the Dublin population that had comfortable access and could be expected to walk or bike to each activity center. Access to each destination was estimated for existing conditions with the existing network and with network recommendations to understand the potential effect of Plan implementation on walk and bike mode share.

### *Network Recommendations*

Public feedback and findings from the existing conditions and needs analysis contributed to the network recommendations (Figure 3, Page 15 in the Executive Summary section and Figure 35, Page 78 in Network Recommendations section of the Plan, provided as Attachment 3), which include:

- *Corridor Projects*. Corridor projects were identified on high-stress roadways that represented major barriers to biking and walking.
- *Point Projects*. Point projects were identified at locations that represented major barriers to biking and walking, including freeway crossings, high-stress trail crossings, high-stress intersections, and locations that experienced a high frequency or severity of collisions.

Over 50 centerline miles and 54-point project locations were identified to increase low-stress bicycle connectivity and reduce barriers to walking by improving crossings and closing gaps in the network. A complete streets approach was taken during the development of infrastructure recommendations. Bicycle-, pedestrian-, and transit-supportive investments are considered in each corridor and crossing project. The project recommendations are presented as a package, with concurrent improvements to support all three active and sustainable travel modes. Network recommendations include:

- Shared Lane (Class III): 12.4 miles
- Bike Lane (Class IIA): 3.1 miles
- Buffered Bike Lane (Class IIB): 17.0 miles
- Path – Shared use path like Iron Horse Regional Trail used by bicycles and pedestrians (Class IA): 7.9 miles
- Complete Streets Study
    - Upgrade to Separated Facility (Class I or Class IV): 10.4 miles
    - Improvements to existing shared use paths adjacent to roadway: 4.9 miles
    - Speed Reduction: 1.3 miles
- Point Projects
    - Freeway Interchange projects: 16 locations
    - Trail Crossing projects: 5 locations
    - Street Intersection projects: 33 locations

### *Program and Policy Recommendations*

Public feedback and findings from the program and policy review and existing conditions and needs analysis contributed to the draft program and policy recommendations. The recommendations are organized into eight topic areas and supported by specific strategies and actions to guide the work of the City's bicycle and pedestrian programs and activities and complement infrastructure recommendations to encourage active transportation in the City.

### *Implementation Strategy*

The project team developed and implemented a prioritization framework, prepared cost estimates, and identified funding sources. The prioritization framework considered factors including safety, social equity, connectivity, and network quality as well as previously identified projects and feasibility of implementation to identify the locations where investments should be prioritized. The infrastructure projects were divided into three tiers, as follows:

- *Tier I Projects.* High priority projects with secured funding or implementation sources.
- *Tier II Projects.* High priority projects with no identified funding source.
- *Tier III Projects.* Lower priority investments that support a full low-stress walking, biking, and rolling network across the City with no identified funding source.

The total cost of all the projects identified in this Plan is approximately $104 million to $215 million. The low-end of the cost estimate assumes implementation of projects by reorganization of the roadway through restriping and minor, quick-build treatments, such as creating curb extensions using delineators and paint. The high-end of the cost estimate considers the need to move the curb to add new bicycle facilities, upgrade bicycle facilities, update or add pedestrian crossings, update pedestrian facilities, add street trees, redesign freeway interchange ramps, and

add signage. The cost estimates also include soft costs for Staff time, engineering, design support, construction management, and contingency.

Active transportation projects in Dublin have typically been funded through a combination of funding sources, including ballot measure monies (e.g., Alameda County Measure B and BB), the City's General Fund, funds collected through developer fees, and State, regional, and federal grants. The Plan identifies potential funding sources and relevant requirements. A few of the projects identified in Tier I are partially funded by the above-mentioned funding sources and will be implemented through various projects in the adopted 2022-2027 Capital Improvement Program (CIP).

### *Bicycle and Pedestrian Plan: Supplemental Design Guidance*

The draft Supplemental Design Guidance document (Page 270 of Attachment 4 – Appendix D) identifies relevant resources for a variety of design topics applicable to planning and designing bicycle and pedestrian facilities. Specifically, it includes topics in developing Dublin's biking and walking infrastructure, including bikeway selection and facility design, bicycle facilities through intersections, accessible pedestrian signals, and crosswalk improvements.

## REVIEW BY APPLICABLE DEPARTMENTS AND AGENCIES:

- *Technical Advisory Committee (TAC) Meetings*. A TAC composed of staff from the cities of Dublin, Pleasanton, and Livermore, as well as AC Transit, Livermore Amador Valley Transit Authority, BART, Dublin Unified School District (DUSD), Caltrans, and various City departments were engaged at key milestones to provide ongoing input on technical analysis and deliverables. There were four TAC meetings over the course of the project between spring 2020 and 2022.
- *Bicycle and Pedestrian Advisory Committee (BPAC) Meetings*. The Alameda County Transportation Commission (Alameda CTC) BPAC, which serves as Dublin's local BPAC, was engaged at key milestones to provide ongoing input on technical analysis and deliverables. There have been five BPAC meetings with the fifth and final meeting held in July 2022.
- *City Council Information Session*. The Plan was presented to the City Council on August 16, 2022. The majority of the feedback was positive. The Mayor and Councilmembers supported the vision of an all-ages and -abilities network and appreciated the recommendations identified in the Plan. Most of the discussion was related to the potential funding sources and implementation timelines for Tiers I, II, and III projects. There were several comments about the importance of coordination with adjacent jurisdictions and other agencies (e.g., Caltrans, BART, DUSD). The City Council's comments have been addressed and incorporated into the Plan.
- *Parks and Community Services Commission.* The Plan was presented to the Parks and Community Services Commission on September 19, 2022. The majority of the feedback was positive. The Commissioners supported the vision of an all-ages and -abilities network and appreciated the recommendations identified in the Plan. Most of the comments were about specific projects, priorities, or policies. For example, one Commissioner suggested prioritizing enhanced connections around the future Emerald High School and SCS

Property, while another suggested considering a requirement to provide e-bike charging locations. The Parks Commission's comments have been addressed and incorporated into the Plan.

- *Planning Commission:* The Plan was presented to the Planning Commission on November 8, 2022. Staff responded to questions from Commissioners about proposed improvements in Downtown Dublin, the percentage of pedestrian injuries, progress towards completing bike lanes identified in the current plan, e-bikes and how proposed improvements will be funded. There were three public speakers who were supportive of the Plan but provided comments and suggested changes. The Planning Commission unanimously recommended approval of the Plan to the City Council and requested that Staff return in two years with a report on the Plan implementation and challenges (PC Resolution No. 22-15, Attachment 5).

To address some of the common concerns heard at the above-mentioned public meetings regarding the bicycle and pedestrian infrastructure around the future Emerald High School and the SCS Property, a new recommendation that would allow a complete streets study on Dublin Boulevard east of Tassajara Road was added to the proposed project list. Additionally, the proposed project in the vicinity of the future Emerald High School on Central Parkway along with a proposed project in the Downtown area on Dublin Boulevard was moved to a higher tier. Staff will also continue to monitor the impact of emerging trends such as e-bikes as mentioned under the Emerging Technologies and Innovations Policy in Section 5 - Recommended Policies Programs, Policies and Practices in the Plan.

## ENVIRONMENTAL DETERMINATION:

The Plan is statutorily exempt from the California Environmental Quality Act (CEQA) requirements pursuant to Public Resource Code (PRC) Section 21080.20 Bicycle Transportation Plans because it consists of bicycle and pedestrian transportation improvements for the urbanized City of Dublin. The plan focuses on restriping streets and highways, signage for bicycles, pedestrians, and vehicles, and signal timing to improve intersection operations. Recommended projects within the Plan that do not fall strictly within the project types described under PRC Section 21080.20 include feasibility studies, a project previously approved following CEQA review, projects that would be statutorily exempt from CEQA pursuant to PRC Section 21080.25, and projects that would be categorically exempt from CEQA pursuant to CEQA Guidelines Section 15301 Existing Facilities, CEQA Guidelines Section 15303 New Construction or Conversion of Small Structures, and CEQA Guidelines Section 15304, Minor Alterations to Land. Such projects would be subject to independent environmental review prior to implementation. The CEQA Exemption Eligibility Memo (Attachment 2) discusses these exemptions in further detail.

## STRATEGIC PLAN INITIATIVE

Strategy 1: Downtown Dublin and Economic Development
Objective A: Continue support of the Downtown Preferred Vision and Downtown Dublin Specific Plan including improving visual and environmental quality and evaluating specific business uses.

Strategy 5: Safe and Accessible Community
Objective E: Support existing and innovative public safety efforts.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

The Plan, along with the Plan's Supplemental Design Guidance was posted on the City's website prior to the City Council meeting on August 16, 2022, was sent via e-mail on September 8, 2022 to parties who signed up for notification through the Dublin Outreach website "dublinbikeped.org" and the City's "Notify Me" system, and was posted on the City's social media channels on September 12, 2022.

A public notice regarding this public hearing was published in the *East Bay Times*. A copy of this Staff Report was sent to Alameda County Transportation Commission's Independent Watchdog Committee. The City Council Agenda was posted.

## ATTACHMENTS:

1) Resolution Adopting the Bicycle and Pedestrian Plan and Finding the Plan Exempt From the California Environmental Quality Act
2) Exhibit A to the Resolution - CEQA Exemption Eligibility Memo
3) Exhibit B to the Resolution - Draft Dublin Bicycle and Pedestrian Plan
4) Appendices to Draft Bicycle and Pedestrian Plan
5) Planning Commission Resolution No. 22-15 - Recommending that the City Council Adopt the Bicycle and Pedestrian Plan and Find the Plan Exempt from the California Environmental Quality Act

**RESOLUTION NO. 23-xx**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DUBLIN**

**ADOPTING THE BICYCLE AND PEDESTRIAN PLAN AND FINDING THE PLAN EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT**

**WHEREAS,** on July 17, 2007, the City Council adopted the Bikeways Master Plan (2007 Bikeways Master Plan) and associated amendments to the Dublin General Plan and various Specific Plans for consistency with the Bikeways Master Plan; and

**WHEREAS,** on October 7, 2014, the City Council adopted the Bicycle and Pedestrian Master Plan (2014 Plan) that combined the update to the 2007 Bikeways Master Plan and the City's first Pedestrian Plan into a comprehensive document that provides policies, network plans, prioritized project lists, support programs and best practice design guidelines for bicycling and walking in Dublin; and

**WHEREAS,** on October 7, 2014, the City Council also adopted amendments to the Dublin General Plan, Eastern Dublin Specific Plan, Dublin Historic Village Area Specific Plan, Downtown Dublin Specific Plan, and Dublin Zoning Ordinance to ensure that the text and maps remain consistent with the 2014 Bicycle and Pedestrian Master Plan update; and

**WHEREAS,** Policy 1-3 of the 2014 Bicycle and Pedestrian Master Plan recommends an update every five years to reflect best practices in bicycle and pedestrian policy and design, changing community interests and needs, and remain eligible for Bicycle Transportation Account (BTA) funding; and

**WHEREAS,** this Bicycle and Pedestrian Plan updates and replaces the City's 2014 Plan by building upon the 2014 Plan's goals and recommendations and by using new guidance documents. The update resulted in infrastructure, program, and policy recommendations that support walking and biking in Dublin; and

**WHEREAS,** it was determined that no further amendments to the Dublin General Plan and Specific Plans are required at this time; and

**WHEREAS**, the update to the 2014 Plan has been renamed the Bicycle and Pedestrian Plan (Plan); and

**WHEREAS,** in accordance with the California Environmental Quality Act (CEQA) certain projects require review for environmental impacts and, when applicable, environmental documents to be prepared; and

**WHEREAS,** pursuant to the requirements of CEQA, the Plan was examined to determine if the environmental review is required. The analysis concluded that the Plan is exempt from CEQA review as follows (**Exhibit A** - CEQA Exemption Eligibility Memorandum, dated October 2022):

- The Plan qualifies for the statutory exemption pursuant to Public Resource Code Section 21080.20 Bicycle Transportation Plans because it consists of bicycle and pedestrian transportation improvements for the urbanized City of Dublin.
- Some of the implementation measures and projects identified in the Plan are also statutorily exempt under Public Resources Codes section 21080.25.
- In addition, the Plan and some implementation projects under the Plan qualify for the following categorical exemptions and none of the exceptions under CEQA Guidelines 15300.2 apply: CEQA Guidelines Section 15301 Existing Facilities, CEQA Guidelines Section 15303 New Construction or Conversion of Small Structures, and CEQA Guidelines Section 15304, Minor Alterations to Land; and

**WHEREAS,** following a noticed public hearing on November 8, 2022, the City of Dublin Planning Commission adopted Resolution No. 22-15 recommending that the City Council find that the Plan is exempt from CEQA and that the City Council adopt the Bicycle and Pedestrian Plan, attached here to as Exhibit B; and

**WHEREAS,** the City Council held a properly noticed public hearing on the Plan and CEQA exemptions, on January 10, 2023, at which time all interested parties had the opportunity to be heard; and

**WHEREAS,** the City Council did hear and consider the Plan and CEQA exemptions and related comments and responses, all said reports, recommendations and testimony at the hearing; and

**WHEREAS**, the location and custodian of the documents or other material which constitute the record of proceedings for the Plan is the City of Dublin Public Works Department, 100 Civic Plaza, Dublin, CA 94568.

**NOW, THEREFORE, BE IT RESOLVED** that the foregoing recitals are true and correct and made a part of this Resolution.

**BE IT FURTHER RESOLVED** that on the basis of the findings above and the record as a whole (including **Exhibit A** - the CEQA Exemption Eligibility Memo), the City Council of the City of Dublin does hereby find that the project is exempt from CEQA and directs Staff to file the Notice of Exemption with the Office of Planning and Research, Alameda County Clerk.

**BE IT FURTHER RESOLVED** that the City Council of the City of Dublin does hereby adopt the Bicycle and Pedestrian Plan (**Exhibit** B).

**PASSED, APPROVED, AND ADOPTED** this 10th day of January 2023 by the following vote:

**AYES:**

**NOES:**

**ABSENT:**

**ABSTAIN:**

_____
Mayor

**ATTEST:**

_____
City Clerk

**Exhibit A**




# Dublin Bicycle and Pedestrian Plan
# City Project No. ST0517

## CEQA Exemption Eligibility Memorandum

*prepared by*

**City of Dublin**
100 Civic Plaza
Dublin, California 94568
Contact: Sai Midididdi, Associate Civil Engineer (Traffic)

*prepared with the assistance of*

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**October 2022**

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

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# 1. Introduction

Rincon Consultants, Inc. prepared this Exemption Eligibility Memorandum for the City of Dublin's Citywide Bicycle and Pedestrian Plan Update (Plan). The purpose of this memorandum is to assess whether the Plan meets the provisions of Public Resources Code (PRC) Section 21080.20, which provides a Statutory Exemption from the California Environmental Quality Act (CEQA). This exemption recognizes that CEQA does not apply to a bicycle transportation plan for an urbanized area that includes restriping of streets and highways, bicycle parking and storage, signal timing to improve street and highway intersection operations, and related signage for bicycles, pedestrians, and vehicles. This memorandum also identifies other statutory and categorical exemptions that are applicable to specific projects recommended within the Citywide Bicycle and Pedestrian Plan Update, including PRC Section 21080.25; CEQA Guidelines Section 15301, Existing Facilities; CEQA Guidelines Section 15303, New Construction or Conversion of Small Structures; and CEQA Guidelines Section 15304, Minor Alterations to Land. This memorandum accompanies the Notice of Exemption in determining the Plan qualifies for an exemption from CEQA.

# 2. Plan Location and Description

The Citywide Bicycle and Pedestrian Plan Update would be implemented in the City of Dublin. Dublin is 14.59 square miles in area, located in Alameda County along I-580, approximately 350 miles north of Los Angeles and 35 miles east of San Francisco. The City of Dublin is generally bounded by the City of San Ramon to the north, Castro Valley to the west, the City of Pleasanton to the south, and the City of Livermore to the east.

The Plan would update the City of Dublin's 2014 Citywide Bicycle and Pedestrian Master Plan and would reflect current conditions and changes in community demographics, the physical environment, and public policy. The Plan would reflect a comprehensive citywide effort to guide, prioritize, and implement a network of quality bicycle and pedestrian facilities to improve mobility, connectivity, public health, physical activity, and recreational opportunities. The Plan would also assess existing system conditions, analyze community needs, and evaluate demographic data.

# 3. Senate Bill 288

Senate Bill (SB) 288, signed into law at the end of the 2020 legislative session, facilitates projects that broaden California's development of sustainable transportation facilities through streamlining of CEQA review requirements. Specifically, SB 288 amends PRC Section 21080.20, which exempts bicycle transportation plans (including those with pedestrian improvements) for urbanized areas, to extend exemption eligibility through the end of 2029. SB 288 also repeals the requirement for lead agencies to conduct traffic and safety impact assessments. Lead agencies must file a notice of exemption when pursuing the exemption for one of these project types.

SB 288 also added CEQA exemptions under PRC Section 21080.25 for the following project types: pedestrian and bicycle facilities, transit prioritization, conversion of roadways to bus-only lanes, expansion of bus or light rail service, charging stations for zero-emission transit buses, or projects that reduce minimum parking requirements. This exemption expires at the end of 2022 but may be replaced by SB 922, which would extend CEQA exemptions under PRC Section 21080.25 until the end of 2029. SB 922 was enrolled in August 2022 but has not yet been signed into law. PRC Section

21080.25 specifically details exemptions for new pedestrian and bicycle facilities including, but not limited to, bicycle parking, bicycle sharing facilities, and bikeways, as long as certain conditions are met. Therefore, individual projects recommended within the Plan would be further eligible for statutory exemption from CEQA at the project level under PRC Section 21080.25, should SB 922 be signed into law.

# 4. Statutory Exemption Consistency Analysis

The Plan qualifies for the SB 288 exemption under PRC Section 21080.20 as a bicycle and pedestrian transportation plan for an urbanized area. A bicycle transportation plan exempt from CEQA must be in conformance with the requirements of SB 288, as articulated in PRC Section 21080.20. The following analysis assesses how the Plan meets each of the SB 288 stipulations.

*(1) The plan is located in an urbanized area.*

The term "urbanized area," as defined by the general CEQA classification in PRC Section 21071, is an incorporated City that either has a population of at least 100,000 persons or has a population of less than 100,000 persons if the population of that city and not more than two contiguous incorporated cities combined equals at least 100,000 persons. The City of Dublin is an incorporated city with a population of 72,932 in 2022 (California Department of Finance 2022). The City of Pleasanton is also an incorporated city, is contiguous with the City of Dublin, and has a population of 77,609 in 2022. The City of Dublin and the City of Pleasanton are two contiguous incorporated cities with a combined population of approximately 150,541 in 2022. Therefore, the Plan meets this requirement.

*(2) The plan consists of restriping of streets and highways, bicycle parking and storage, signal timing to improve street and highway intersection operations, and related signage for bicycles, pedestrians, and vehicles.*

The Plan contains approximately 125 recommended projects that primarily focus on the restriping of streets and highways; signage for bicycles, pedestrians, and vehicles; and signal timing to improve intersection operations. Therefore, the Plan meets this requirement.

*(3) The lead agency shall hold one noticed public hearing in the area affected by the bicycle transportation plan to hear and respond to public comments prior to determining that a project is exempt. The notice must be published in a newspaper of general circulation in the area affected by the proposed project.*

The Draft Plan, the Plan's Design Guidelines, and the Staff Report were made available to the public through the City of Dublin website when the Draft Plan was taken to the Dublin City Council as an informational item on August 16, 2022. Furthermore, the Draft Plan was sent via email on September 8, 2022, to parties who signed up for notification through the Dublin Outreach website (dublinbikeped.org) and the City's Notifyme system. The Draft Plan was posted on the City of Dublin's social media channels (NextDoor, Facebook, Instagram, and Twitter) on September 12, 2022. The Draft Plan was also presented to Parks and Community Services Commission on September 19, 2022. In addition, the Plan will be considered at a noticed public hearing by both the Planning Commission and the Dublin City Council, where members of the public will have an opportunity to comment. Therefore, the Plan meets this requirement.

# 5. Additional Exemption Eligibility

Some trail and trail connection projects recommended in the Plan may not fall within the project types described under PRC Section 21080.20. However, most of these projects are located within existing paved areas and rights-of-way, would be built out with other proposed development projects requiring independent environmental review, and/or would be undertaken by a different lead agency., Many of these projects would be eligible for a categorical exemption at the project level, as described below. In addition, two projects (bicycle and pedestrian bridge over the Alamo Canal at Civic Plaza and bicycle and pedestrian connection to Alamo Canal and Iron Horse Trail at Sierra Court Cul-de-sac (T-8 and C-3)) recommended in the Plan identify specific projects for future study. These projects are unfunded, are not included in the City's current Capital Improvement Program (CIP) and would require independent environmental review after future study and project design, prior to implementation. Furthermore, Project C-2 (Iron Horse Trail Dublin Boulevard Overcrossing Project) is not listed in the exemption criteria but was previously approved following CEQA review (State Clearinghouse No. 2012062009) and is currently under construction.

## CEQA Guidelines Section 15301 Existing Facilities

CEQA Guidelines Section 15301 details Class 1 exemptions that consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features. These projects must involve negligible or no expansion of existing or former use. Examples of projects eligible for a Class 1 exemption under subsection (c) include, but are not limited to, existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and other similar alterations that do not create additional automobile lanes. The addition of trails and trail connections to existing roadways, trails, and paths would be eligible for exemption under CEQA Section 15301(c), as such projects would constitute negligible expansion of existing use and would not create additional automobile lanes.

## CEQA Guidelines Section 15303 New Construction or Conversion of Small Structures

CEQA Guidelines Section 15303 details Class 3 exemptions for projects that consist of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure. Examples of projects eligible for a Class 3 exemption under subsection (d) include, but are not limited to, water main, sewage, electrical, gas, and other utility extensions, including street improvements, of a reasonable length to serve such construction. The addition of some trail connections would be eligible for exemption under CEQA Section 15301(d), as they would consist of the construction of a limited number of new small street improvements.

## CEQA Guidelines Section 15304 Minor Alterations to Land

CEQA Guidelines Section 15304 details Class 4 exemptions that consist of minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes. Examples of projects eligible for a Class 4 exemption under subsection (h) include, but are not limited to, the creation of bicycle lanes on existing rights-of-way. Many of the trail projects recommended in the Plan would

take place within existing rights-of-way and would therefore be eligible for exemption under CEQA Section 15304(h).

# 6. Conclusion

Based on the analysis documented in this memorandum, the proposed Citywide Bicycle and Pedestrian Plan Update would meet the requirements for an exemption from CEQA. Therefore, it is concluded that the Plan is statutorily exempt from CEQA pursuant to PRC Section 21080.20. Recommended projects within the Plan that do not fall strictly within the project types described under PRC Section 21080.20 include feasibility studies, a project previously approved following CEQA review, projects that would be statutorily exempt from CEQA pursuant to PRC Section 21080.25, and projects that would be categorically exempt from CEQA pursuant to CEQA Guidelines Section 15301, Existing Facilities, CEQA Guidelines Section 15303, New Construction or Conversion of Small Structures, and CEQA Guidelines Section 15304, Minor Alterations to Land. Such projects would be subject to independent environmental review prior to implementation.

# 7. References

California Department of Finance (DOF). 2022. "Population Estimates for Cities, Counties, and the State - January 1, 2021 and 2022" https://dof.ca.gov/forecasting/demographics/estimates/estimates-e4-2010-2020/ (accessed September 2022).

California Legislative Information. 2020. SB-288 California Environmental Quality Act: exemptions: transportation-related projects. Published September 30, 2020. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200SB288 (accessed September 2022).



DRAFT

# DUBLIN BICYCLE AND PEDESTRIAN PLAN

OCTOBER 2022

# ACKNOWLEDGMENTS

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Sherry Hu (Councilmember)

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Appendix



# EXECUTIVE SUMMARY

## THE NEED FOR A BICYCLE AND PEDESTRIAN PLAN

In Dublin, residents and visitors walk and bike for transportation and recreation. People walking and biking are vulnerable road users, and the City needs a connected network of quality infrastructure and amenities to support safe travel by these sustainable modes. Walking and biking for transportation improves health and well-being and provides numerous environmental and economic benefits.

The City of Dublin's Bicycle and Pedestrian Plan (Plan) is a critical planning, policy, and implementation document that supports City efforts to improve safety and attractiveness of biking and walking as a means of transportation and recreation. This Plan builds on, updates, and replaces the 2014 Dublin Bicycle and Pedestrian Plan (2014 Plan) and makes recommendations for infrastructure, programs, and policies that support walking and biking in Dublin.

## VISION STATEMENT

**The City of Dublin is a vibrant place where walking and biking are safe, comfortable, and convenient ways to travel. In Dublin, walking and biking connects individuals, inclusive of all ages and abilities, to local and regional destinations.**



## GOAL 1

### Enhance Safety

Prioritize safety in design and implementation of walking and biking facilities.

## GOAL 2

### Increase Walking and Biking

Support biking and walking as attractive modes of transportation.

## GOAL 3

### Improve Connectivity

Develop a bicycle and pedestrian network that provides well-connected facilities for users of all ages and abilities.

## GOAL 4

### Enhance Accessibility

Utilize principles of universal design to make biking and walking a viable transportation option for all, including people with disabilities.

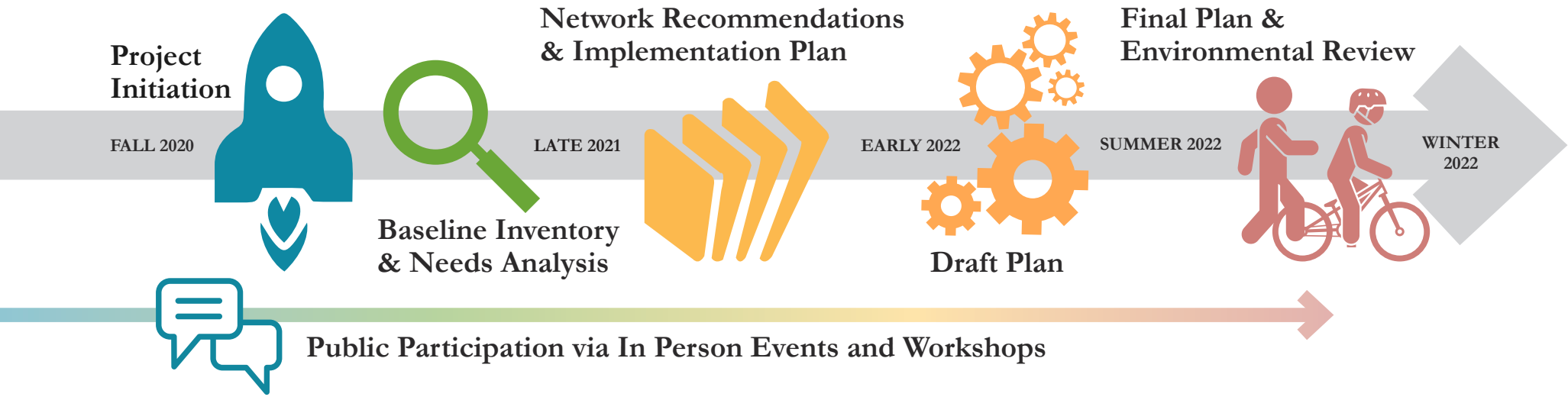
## GOAL 5

### Prioritize Investments

Maintain sufficient funding to provide for existing and future bicycle and pedestrian needs, including supporting programs and operation and maintenance. Leverage biking and walking projects to promote economic activity and social equity outcomes among people of all ages and abilities.



# PROCESS




# ORGANIZATION

The Plan document is organized in the following chapters:

**1. INTRODUCTION**—Outlines the project's background, vision, planning process, timeline, and goals.

**2. COMMUNITY & STAKEHOLDER ENGAGEMENT**—Summarizes the approach to, and findings from, community and stakeholder engagement activities.

**3. WALKING & BIKING IN DUBLIN TODAY**—Maps and analyzes physical and socioeconomic conditions applicable to improving walking and biking in Dublin. Evaluates bicycle level of traffic stress, collision history, high injury streets, and other barriers to walking and biking.

**4. RECOMMENDED BICYCLE & PEDESTRIAN NETWORK**—Summarizes the approach to developing network recommendations and presents the recommended citywide bicycle and pedestrian network.

**5. RECOMMENDED PROGRAMS, POLICIES, & PRACTICES**—Summarizes the approach to developing non-infrastructure recommendations and presents the program and policy recommendations.

**6. IMPLEMENTATION STRATEGY**—Summarizes the prioritization framework and presents a tiered list of projects for implementation that considers resource availability and funding opportunities. Presents cost estimates and identifies potential funding sources for these recommendations.

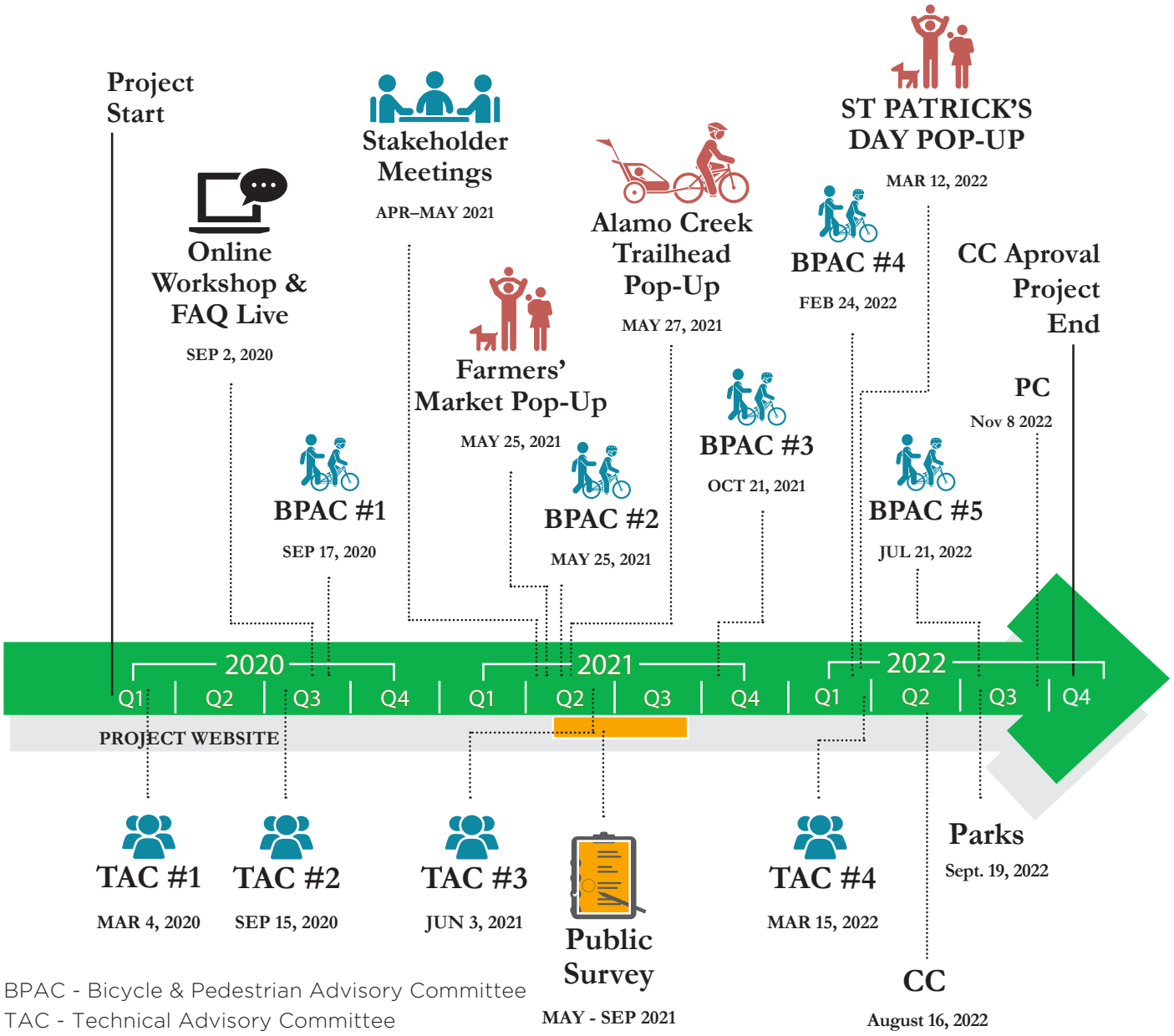
**7. LOOKING AHEAD**—Recaps key findings from prior chapters and discusses next steps for Plan implementation.

**8. TECHNICAL APPENDIX**—Includes bicycle and pedestrian facility design guidelines and provides memorandums documenting technical analysis and engagement activities.

# COMMUNITY & STAKEHOLDER ENGAGEMENT

At the outset of the planning process, a community engagement plan was created to outline activities, methods, and tools that would be used for public and stakeholder engagement. Due to the outbreak of the coronavirus pandemic and subsequent stay-at-home orders, the community and stakeholder engagement effort included digital outreach. In-person events were held when it was safe to do so.

For more, see Chapter 2.



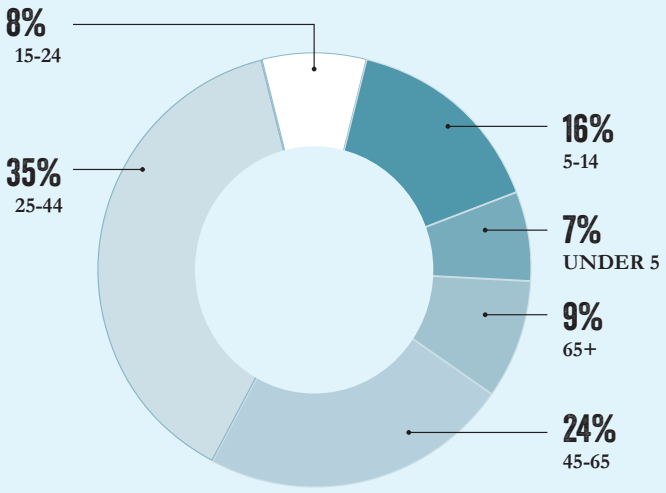

BPAC - Bicycle & Pedestrian Advisory Committee
TAC - Technical Advisory Committee
CC - City Council
PC - Planning Commission
Parks - Parks Commission

## DUBLIN DEMOGRAPHIC SNAPSHOT

### Dublin Population

**61,240**

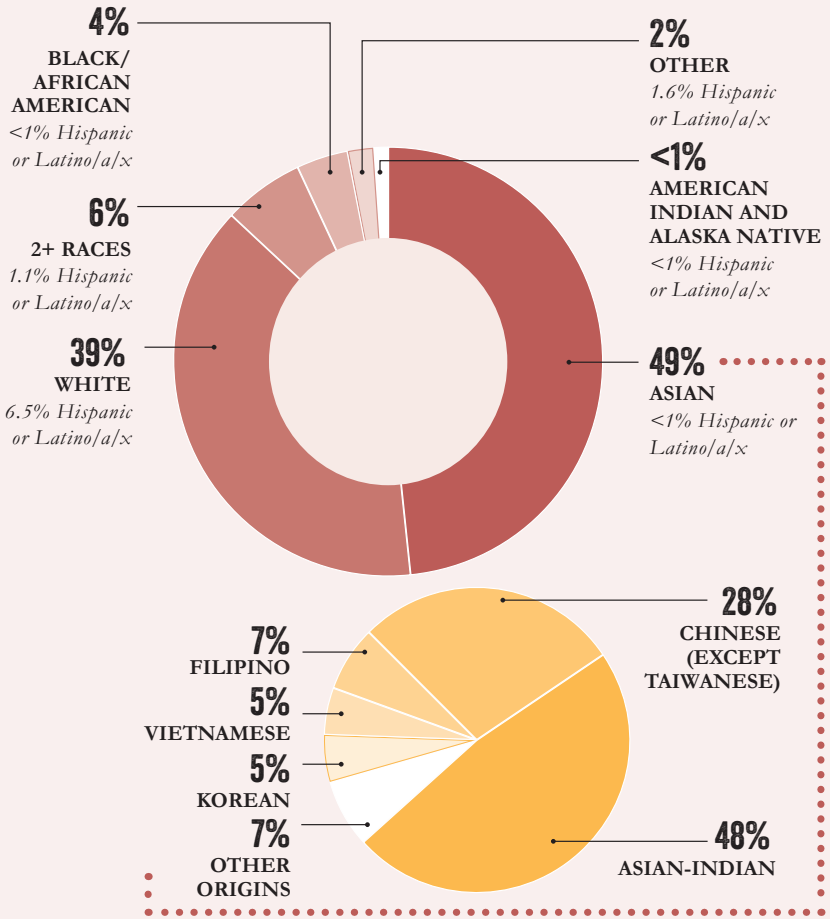
### Dublin Population by Age



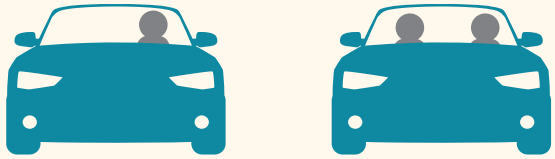

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*Source: US Census American Community Survey 5-year Estimates (2015-2019)*

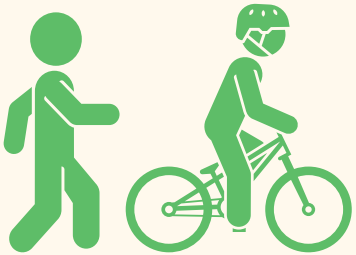
### Dublin Population by Race/Ethnicity



# Commute Snapshot



**67%** DRIVE ALONE & **9%** CARPOOL



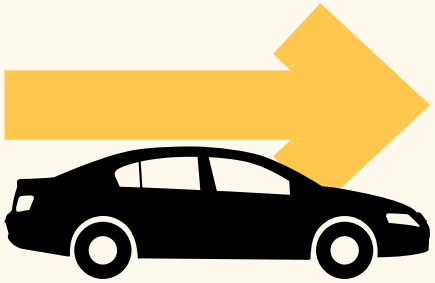
**2%**
EITHER WALK OR BIKE

*2015-2019 American Community Survey data*

**15%**
TAKE PUBLIC TRANSIT, CAR SHARE (E.G., GETAROUND, TURO), TRANSPORTATION NETWORK COMPANY (E.G., LYFT, UBER), OR A TAXI



MORE THAN
**23,000**
DUBLINERS COMMUTE OUTSIDE THE CITY FOR WORK





**3%**
OF HOUSEHOLDS IN DUBLIN DO NOT OWN A VEHICLE

*Others worked from home or took other modes to work*

# PROGRAM AND POLICY NEEDS

- Additional resources, including staff dedicated to active transportation.
- Updated design guidance and standards to incorporate the innovations and changes since the 2014 Plan.
- Enhanced coordination across departments.
- Clearer processes and stronger policies related to pedestrian and bicycle project maintenance, design review, and implementation.

# SAFETY AND COMFORT

## COLLISION ANALYSIS FINDINGS

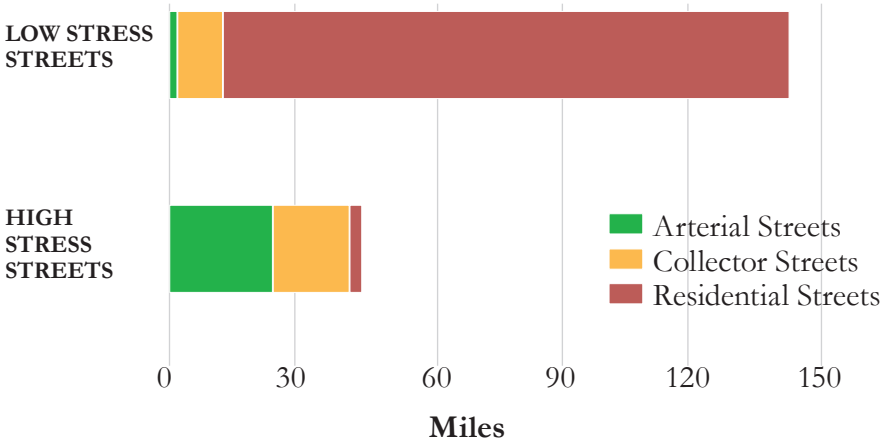
- 68 bicycle-involved collisions over the 6-year period; 3 fatal and severe injury collisions.
- 81 pedestrian-involved collisions over the 6-year period; 12 fatal and severe injury collisions.
- People 15–24 years old are overrepresented in pedestrian and bicycle collisions. They represent 25% and 18% of pedestrians and bicyclists involved in collisions, but make up just 8% of the city's population
- 62% of the pedestrian collisions occurred on just 8.4 miles of roadway that comprise the pedestrian high injury network (see Figure 25)
- 62% of the bicycle collisions occurred on just 6.7 miles of roadway that comprise the bicycle high injury network (see Figure 26).

## BICYCLE LEVEL OF STRESS ANALYSIS

- Low-stress on-street facilities are typically local residential streets without dedicated bicycle facilities.
- Arterial streets, such as Dublin Boulevard, are typically higher-stress due to high vehicular speeds, high traffic volumes, or multiple travel lanes.
- Sidepaths can be high stress or low stress, depending on path width, shoulder width, and presence of wayfinding.
- Only 37 percent of collectors and 7 percent of arterials in Dublin are low stress. Many businesses and services are located on or near collectors, and these desintations can only be accessed with some travel along or across the collectors or arterials.

**For more, see Chapter 3.**

**Figure 1. Miles of Bikeway Stress by Functional Classification**




**Miles do not include paths.*

# WALKING AND BIKING ACCESS

## SCHOOLS

Cottonwood Creek School, Dougherty Elementary, and Kolb Elementary exhibit the highest estimated walk access with around 36 percent of students living within a 10-minute walk.

Access points on high-stress streets create a barrier and reduce the likelihood of students to bike to school.

- Dublin High,
- Frederiksen Elementary,
- Murray Elementary, and
- Wells Middle School.

## BART

Approximately 11 percent of Dublin residents are within a 15-minute walk of either the Dublin/ Pleasanton or West Dublin BART stations.

Less than one percent of "interested and concerned" bicyclists have a low-stress bicycle route to BART.

## JOB CENTERS

Access to job centers is limited by the distance between employment and residential uses.

Job centers are located on high-stress streets, which currently limit safe and comfortable bicycle access to these sites.

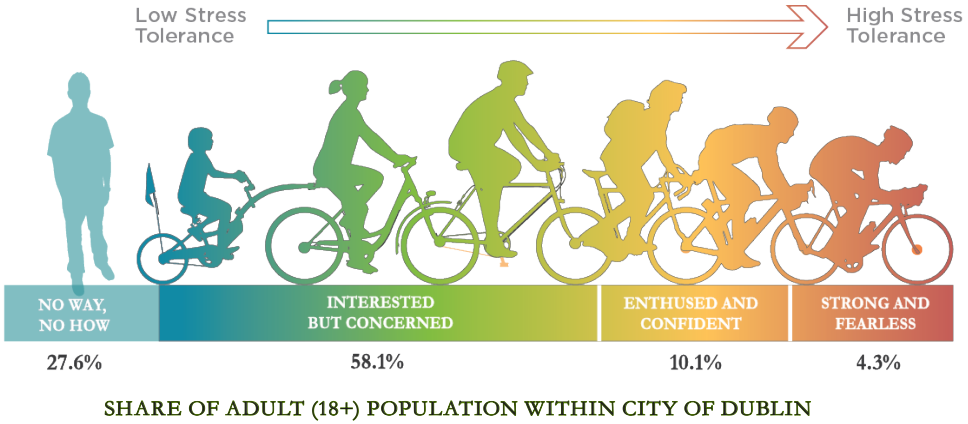
## PARKS

Almost 62 percent of residents live within a 15-minute walk of a park.

Table 18. Pedestrian Typology

| Age | Typology | Walking Characteristics |
|---|---|---|
| Under 14 | Youth | Limited by multilane crossings |
| 14 to 55 | Teenage and Working Age Adults | Strong and capable, but still limited by sidewalk gaps, unsignalized crossings at major roads, and absence of midblock crossings |
| Over 55 | Aging | The limits experienced by young adults and adults and further limited by the absence of curb ramps or long multilane crossings |

Figure 2. Bicyclist Typology




Nearly 42 percent of residents have a low-stress bicycle route to a park.

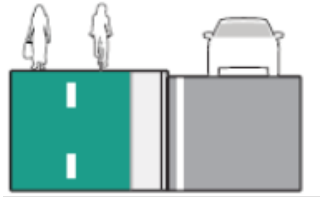
For more, see Chapter 3.

# NETWORK RECOMMENDATIONS

## BICYCLE FACILITIES

The recommended new facilities include the following:

**Shared Lane (Class I): 12.8 miles**

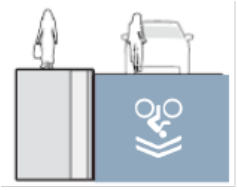


**Standard or Buffered Bicycle Lane (Class II): 19.9 miles**

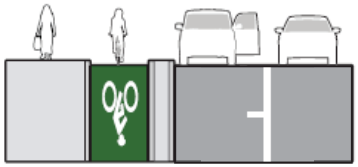




**With Shared Lane (Class III): 12.4 miles**



**Separated Bicycle Lane (Class IV): 10.4 miles**



For more, see Chapter 4.

## PEDESTRIAN FACILITIES

The recommended pedestrian and bicycle networks were developed in tandem using a complete street approach. A suite of pedestrian treatments is recommended along project corridors so that when concept designs are developed, bicycle and pedestrian improvements can be planned, designed, and implemented at the same time.

Pedestrian improvements include:

- consistent sidewalk
- buffers with street trees and green stormwater infrastructure
- high-visibility crosswalks
- accessible curb ramps
- curb extensions
- reduced corner radii
- signal improvements

## SPOT IMPROVEMENTS

Intersections and mid-block locations in the city with relatively high collision frequency and severity relative to the rest of the network have been prioritized for safety enhancements. The recommendations for this Plan include 16 freeway modernization improvements, 33 intersection improvements, and 5 crossing improvements.

For more, see Chapter 4.

# PROGRAM AND POLICY RECOMMENDATIONS

- Coordination and Collaboration
- Emerging Technologies
- Promotion and Encouragement
- Data Collection
- Funding and Implementation
- Supporting Infrastructure and Amenities
- Design
- Operations and Maintenance

For more, see Chapter 5



# IMPLEMENTATION STRATEGY

## PRIORITIZATION FACTORS

Table 1. Prioritization Factors and Variables

| FACTOR | VARIABLE |
|---|---|
| Safety | High-Injury Corridors |
| Social Equity | Youth and Senior Population |
| Connectivity | Demand Analysis |
| | Proximity to Schools |
| Quality of Service | Bicycle Level of Traffic Stress |
| | Sidewalk Gaps |
| Major Barriers | Freeway Crossings |
| Consistency with Past Planning | Previously Identified Projects |

## COST ESTIMATES

### TIER I
**Near-Term Project Cost**

**$21,085,000 - $27,589,000**

### TIER II AND TIER III
**Long-Term Investment Cost**

**$82,250,000- $186,580,000**

For more, see Chapter 6.

## PRIMARY FUNDING SOURCES

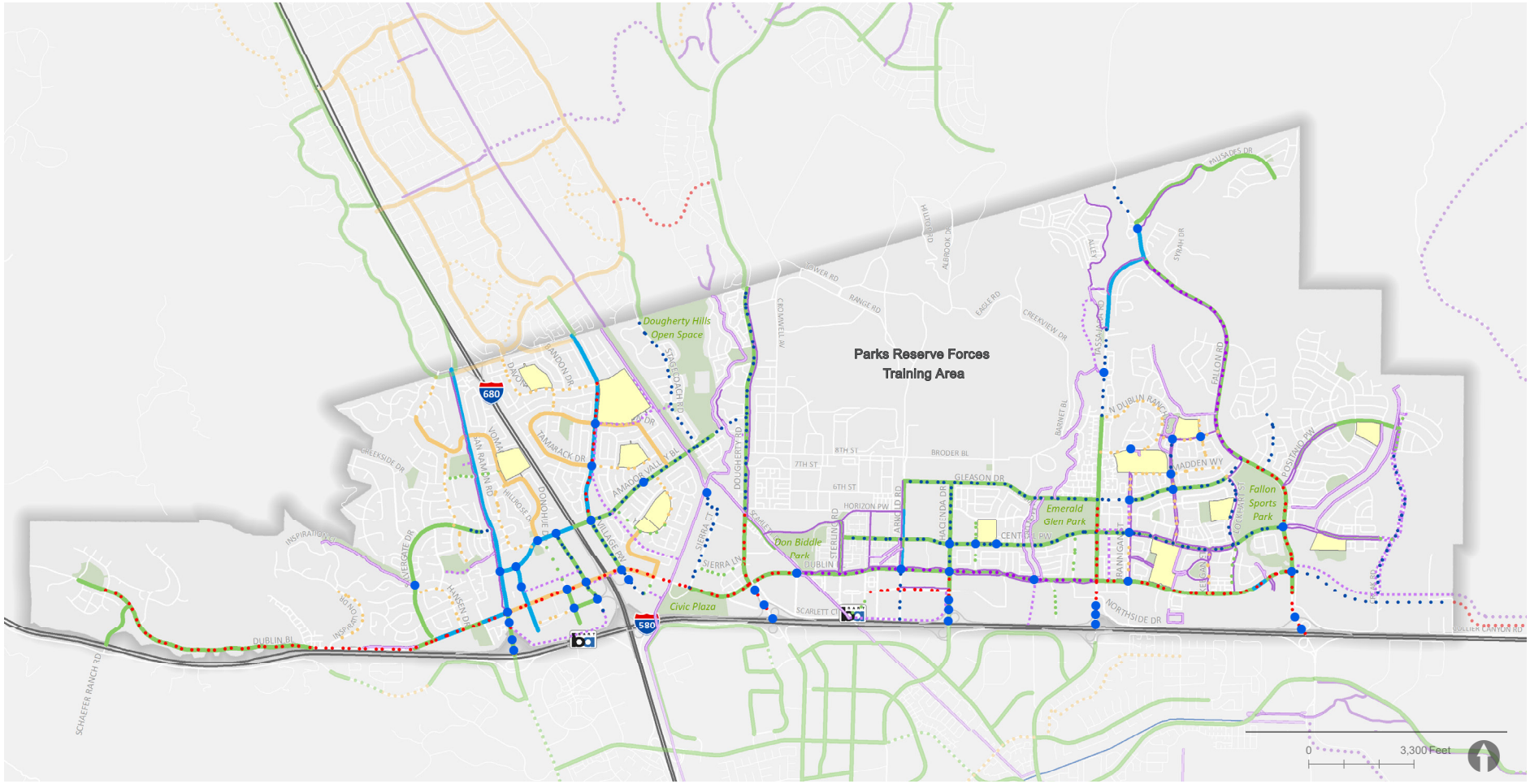
Active transportation projects in Dublin have typically been funded through a combination of ballot measure monies (e.g., Alameda County Measure B, BB, and Measure RR), the City General Fund, the Road Maintenance and Rehabilitation Account, developer-funded projects, and transportation impact fees, with some funding from state, regional, and federal grants. The Bipartisan Infrastructure Law (BIL) or Infrastructure Investment and Jobs Act (IIJA), signed into law in November 2021, established more than two dozen competitive grant programs for infrastructure initiatives. These discretionary grants and other funding sources are described in Chapter 6.

### FUNDING IDENTIFIED IN CAPITAL IMPROVEMENT PROGRAM (2022-2027)

**$1,879,684**
for citywide bicycle and pedestrian projects.

**$12,147,565**
for street resurfacing.

Figure 3. Recommended Projects and Existing Facilities




*Locations with identified proposed segment projects may also include pedestrian improvements such as consistent sidewalks, buffers with street trees and/or green stormwater infrastructure, high-visibility crosswalks, accessible curb ramps, curb extensions, reduced corner radii, and signal improvements.*

*Refer to Table 6 for detailed project descriptions.*

**Proposed Point Project**
- Spot Improvement

**Proposed Segment Project**
- Shared Lane (Class III)
- Bike Lane (Class IIA)
- Buffered Bike Lane (Class IIB)
- Complete Streets Study: Separated Facility (Class I or Class IV)
- Complete Streets Study: Consider Improvements to Existing Sidepaths
- Class I Path Project

**Existing Facility**
- Shared Lane (Class III)
- Bike Lane (Class IIA)
- Buffered Bike Lane (Class IIB)
- Existing Class IA Shared Use Path
- Existing Class IB Sidepath

- Schools
- BART Stations
- Parks




# 1

# 1. INTRODUCTION

This chapter introduces the project, including its background and need, and sets the stage for the analysis, findings, and recommendations detailed in subsequent chapters.

## ABOUT THE PLAN

The City of Dublin's Bicycle and Pedestrian Plan is a critical planning, policy, and implementation document that supports the City's efforts to improve the safety and attractiveness of biking and walking as a means of transportation and recreation. This Plan updates and replaces the City's 2014 Plan by building upon the 2014 Plan's goals and recommendations and by using new guidance documents. The update will result in infrastructure and program and policy recommendations that support walking and biking in Dublin.

## THE 2014 BICYCLE AND PEDESTRIAN MASTER PLAN

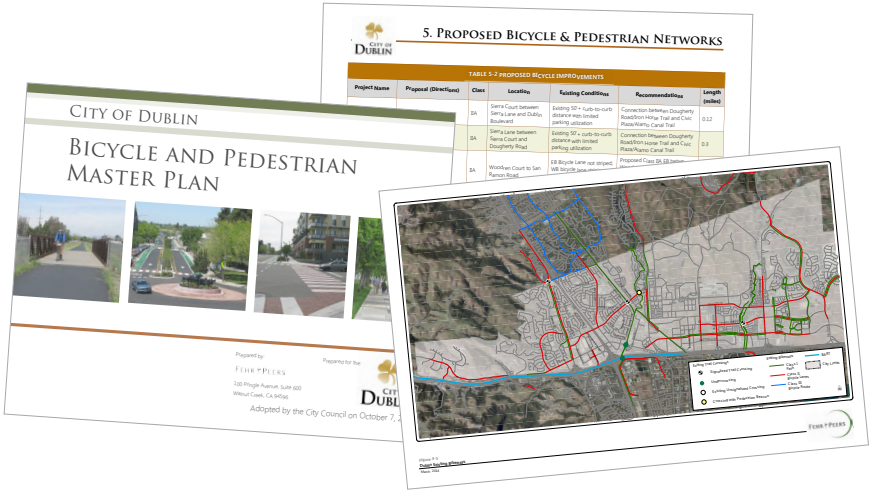
The 2014 Bicycle and Pedestrian Plan, and the following six goals included in the 2014 Plan, provides a baseline for the updated Plan.

### 2014 GOALS

**Goal 1:** Support bicycling and walking as practical, healthy, and convenient alternatives to automobile use in Dublin.

**Goal 2:** Implement a well-connected active transportation system to attract users of all ages and abilities.

**Goal 3:** Incorporate the needs and concerns of bicyclists and pedestrians in all transportation and development projects.




**Goal 4:** Support infrastructure investments with targeted bicycle and pedestrian education, encouragement, enforcement, and evaluation programs.

**Goal 5:** Maximize multi-modal connections in the transportation network.

**Goal 6:** Improve bicycle and pedestrian safety citywide.

## NEW GUIDANCE

Since the 2014 Plan was adopted, bicycle and pedestrian planning and design guidance and standards have evolved to include innovative treatments and guidance from local and national agencies. Best-practice documents should be considered when implementing any bicycle and pedestrian facility. The latest versions of best-practice design guides developed by outside sources should be

consulted regularly to ensure information is up to date. Relevant guidance includes:

- California Manual on Uniform Traffic Control Devices (2018)
- Federal Highway Administration (FHWA) Bikeway Selection Guide (2019)
- FHWA Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts (2016)
- AC Transit Multimodal Corridor Design Guidelines (2019)
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide (2014)
- NACTO Transit Street Design Guide (2016)
- NACTO Urban Street Stormwater Guide (2016)

Relevant documents and additional guidance is presented in the Design Guide (appendix D).

## PROGRESS SINCE THE 2014 PLAN

Since the 2014 Plan's adoption, the City and developers have built 10.8 miles of the 2014 proposal of 35.3 miles of bikeways. They have built seven of the 25 recommended pedestrian projects, and two more are in progress. The infrastructure inventory is presented in Figure 4. This Plan update reevaluates recommendations and carries forward relevant projects from the 2014 Plan.

## RELATIONSHIP TO OTHER PLANS

Federal, state, and local agencies develop policies and publish plans to guide investment and set transportation priorities. Understanding how these plans and policies relate and fit together helps ensure recommendations are consistent with and build on prior planning efforts. This section describes relevant plans and policies. Table 2 presents what aspects of the most relevant existing policy and planning documents were used to guide this Plan's policies and projects.

### FEDERAL POLICIES

**USDOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations**. In 2010, the United States Department of Transportation (USDOT) issued a policy directive in support of walking and bicycling. The policy encouraged transportation agencies to go beyond minimum standards and fully-integrate active transportation into projects. As part of the statement, the USDOT encouraged agencies to adopt similar policy statements in support of walking and bicycling considerations.

**Americans with Disabilities Act**—The Americans with Disabilities Act (ADA) Title III is legislation enacted in 1990 that provides thorough civil liberties protections to individuals with disabilities with regards to employment, state and local government services, and access to public accommodations, transportation, and telecommunications. Title III of the Act requires places of public accommodation to be accessible and usable to all people, including people with disabilities.

Figure 4. Infrastructure Inventory

# INFRASTRUCTURE INVENTORY

DUBLIN CALIFORNIA

The 2014 Dublin Bicycle and Pedestrian Plan produced a suite of infrastructure recommendations, including the following:

## WALKING NETWORK PROJECT TYPES

**A recommended walking network consisting of five main improvement types:**

- INTERSECTION CROSSING TREATMENTS
- SIGNAL MODIFICATIONS
- SIDEWALK IMPROVEMENTS
- REMOVE BARRIERS
- ADA IMPROVEMENTS

Signalized Tassajara Creek trail crossing at Central Parkway. The 2014 Plan recommended Tassajara Creek crossing locations at Dublin Boulevard which have not yet been built.



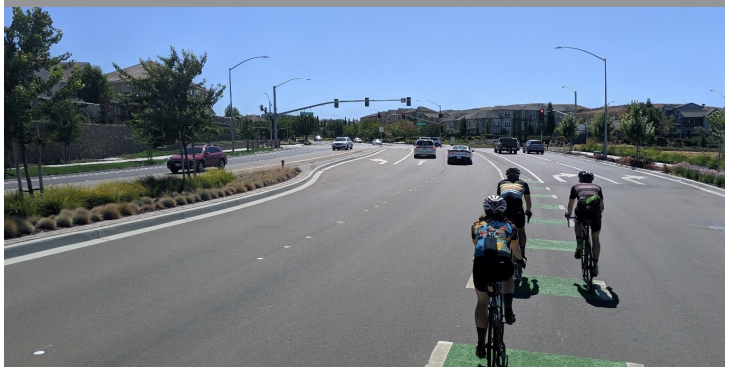

**24** pedestrian infrastructure projects

## BIKEWAY NETWORK PROJECT TYPES

**A recommended bikeway network with the following intended focus:**

- CONNECTIONS TO KEY ACTIVITY CENTERS
- COMFORT AND LOW LEVEL OF STRESS
- CONNECTIONS TO REGIONAL TRAIL SYSTEM
- CONNECTIONS TO ADJACENT CITIES

Class IIA bike lane along Tassajara Road, which was proposed in the 2014 Plan.



**83** bikeway infrastructure projects, **totaling 35.3 miles**

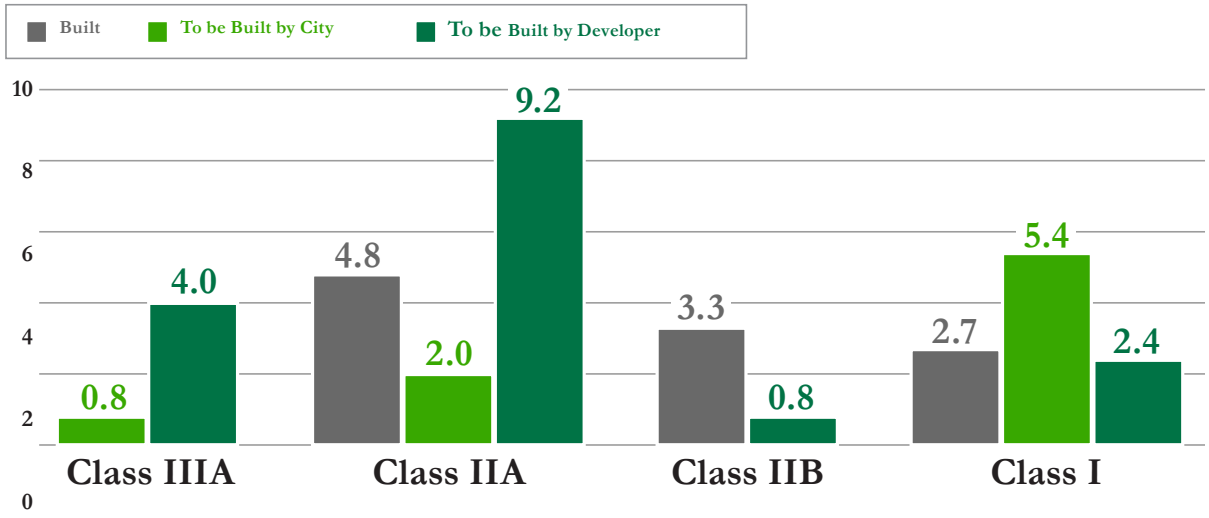
## PROGRESS:

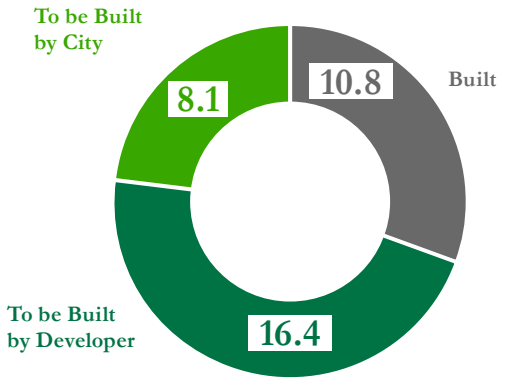
### Pedestrian projects proposed and built, by project type

| PEDESTRIAN IMPROVEMENT TYPE | PROPOSED | BUILT | IN PROGRESS |
|---|---|---|---|
| Intersection crossing treatments | 12 | 2 | 0 |
| Sidewalk improvements | 2 | 0 | 1 |
| ADA improvements | 6 | 1 | 0 |
| Signal modifications | 4 | 1 | 0 |
| Remove Barriers | 3 | 3 | 1 |
| Wayfinding signage | 1 | 0 | 0 |
| **Total** | **28** | **7** | **2** |

*Some projects included multiple types and are double or triple counted into all relevant categories.*

### Bicycle facilities proposed and built, by mileage




*Proposed mixed facilities are listed by their highest proposed class (e.g., Class IIA/IIIA is listed as Class IIA)*

## Figure 5. 2014 Plan Proposed Bikeway Facilities

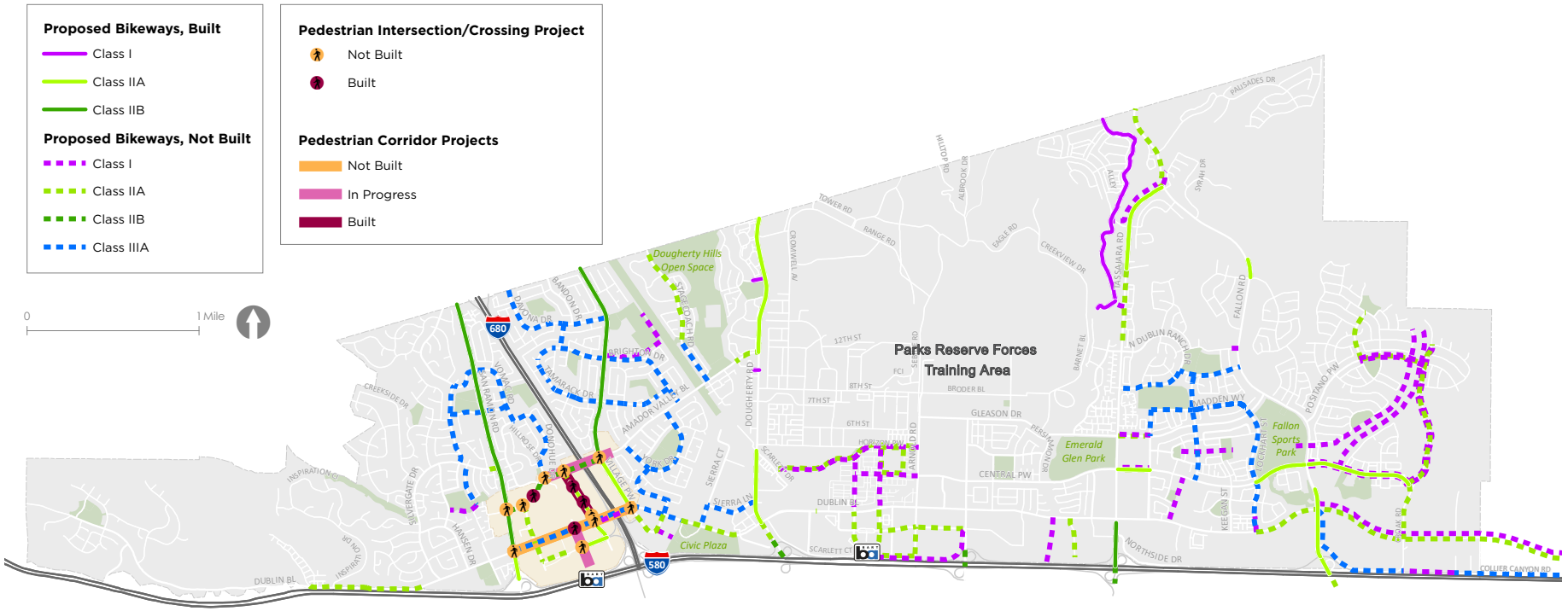


Table 2. Relevant Plans and Policies

| Plan | Relevance to Current Plan | | | | | |
|---|---|---|---|---|---|---|
| | Bicycle Policies | Pedestrian Policies | Facility/ Network Maps | Design Guidelines | Project Recommendations or Concept Designs | Program Recommendations |
| **STATE AND REGIONAL PLANS AND POLICIES** | | | | | | |
| California Green Building Code | ● | | | | | |
| Caltrans Toward an Active California (2017) | ● | ● | ● | | ● | ● |
| Caltrans District 4 Bike Plan (2018) | | | ● | | ● | |
| Caltrans District 4 Pedestrian Plan (2020) | | | ● | | ● | |
| Alameda Countywide Active Transportation Plan (2019) | ● | ● | | | | |
| Metropolitan Transportation Commission (MTC) Plan Bay Area 2050 (2021) | ● | ● | ● | | ● | ● |
| MTC Active Transportation Plan (in progress, anticipated 2022) | ● | ● | ● | ● | ● | ● |
| East Bay Regional Parks District Master Plan (2013) | ● | ● | ● | | | |
| **LOCAL CITY PLANS AND POLICIES** | | | | | | |
| Local Roadway Safety Plan (in progress, anticipated 2022) | | | | | ● | |
| Americans with Disabilities Act Transition Plan (in progress, anticipated 2022) | | | ● | | ● | |

| Plan | | Relevance to Current Plan | | | | | |
|---|---|---|---|---|---|---|---|
| | | Bicycle Policies | Pedestrian Policies | Facility/ Network Maps | Design Guidelines | Project Recommendations or Concept Designs | Program Recommendations |
| **LOCAL CITY PLANS AND POLICIES CONTINUED** | | | | | | | |
| **Streetscape Master Plan (2009)** | | | | | ● | | |
| **Complete Streets Policy (City Council Resolution 199-12) (2012)** | | ● | ● | | | | |
| **Dublin Boulevard Bikeway Corridor and Connectivity Studies (2013)** | | ● | | | | ● | |
| **Pedestrian Safety Assessment (2014)** | | | | | | | ● |
| **Bicycle and Pedestrian Plan (2014)** | | ● | ● | ● | ● | ● | ● |
| **General Plan Land Use & Circulation (2014)** | Circulation & Scenic Highways Element | ● | ● | | | | |
| | Schools, Public Lands, & Utilities Element | ● | ● | | | | |
| **Parks and Recreation Master Plan (2022)** | | | | | ● | | |
| **Iron Horse Regional Trail Feasibility Study (2017)** | | | | | | ● | |
| **Traffic Safety Study Update (2018)** | | | | | | ● | |
| **Climate Action Plan 2030 and Beyond (2020)** | | ● | ● | | | | ● |
| **Downtown Streetscape Master Plan (2020)** | | | | ● | ● | ● | |

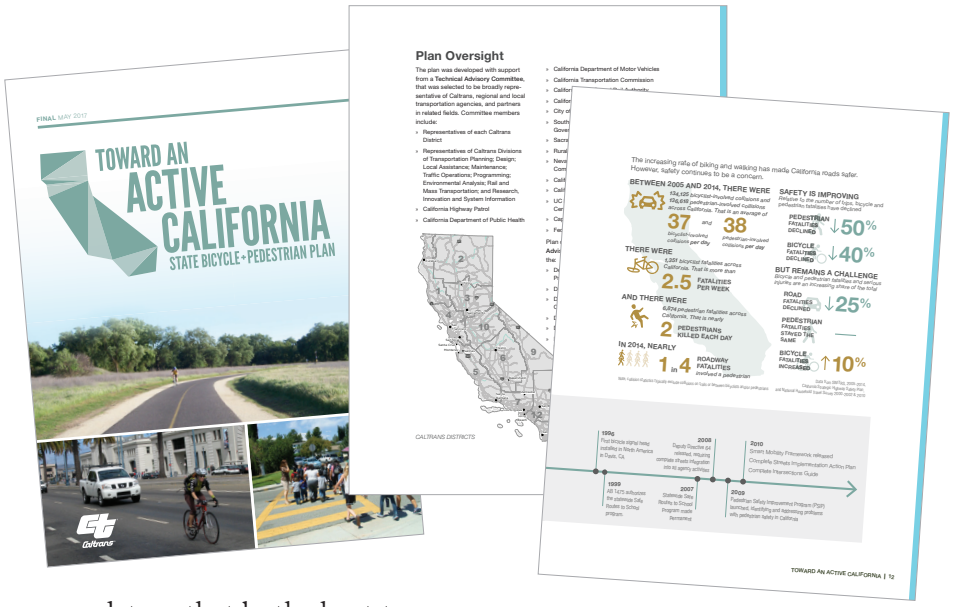
| Plan | | Relevance to Current Plan | | | | | |
|---|---|---|---|---|---|---|---|
| | | Bicycle Policies | Pedestrian Policies | Facility/ Network Maps | Design Guidelines | Project Recommendations or Concept Designs | Program Recommendations |
| **Green Stormwater Infrastructure Plan (2019)** | | | | | ● | ● | |
| **Specific Plans** | Dublin Crossing (2013) | | | ● | ● | ● | |
| | Downtown (2014) | | | | ● | ● | |
| | Dublin Village Historic Area (2014) | | | ● | | | |
| | Eastern Dublin (2016) | ● | ● | | | ● | |
| **FEDERAL PLANS AND POLICIES** | | | | | | | |
| **USDOT Policy Statement on Bicycle and Pedestrian Accomodation Regulations and Recommendations** | | ● | ● | | | | ● |
| **Americans with Disabilities Act** | | | ● | | ● | | ● |

## STATE AND REGIONAL PLANS AND POLICIES

**Complete Streets Act of 2008:** California's Complete Streets Act of 2008 (Assembly bill 1358) requires all cities to modify the circulation element of their general plan to "plan for a balanced, multimodal transportation network that meets the needs of all users" when a substantive revision of the circulation element occurs. The law went into effect on January 1, 2011. The law also directs the Governor's Office of Planning and Research to amend its guidelines for the development of circulation elements to aid cities and counties in meeting the requirements of the Complete Streets Act.

**Senate Bill 375/Assembly Bill 32:** California Assembly Bill 32 requires greenhouse gas emissions to be reduced by 28 percent by the year 2020 and by 50 percent by the year 2050. Senate Bill 375 provides the implementation mechanisms for Assembly Bill 32. Senate Bill 375 requires metropolitan planning organizations and regional planning agencies to plan for these reductions by developing sustainable community strategies (SCS), which will be a regional guide for housing, land uses, and transportation and will incorporate the Regional Transportation Plan (RTP). A key component of SCS is the reduction of automobile trips and vehicle miles traveled. Planning for increases in walking, bicycling, and transit use as viable alternatives to automobile travel are important components of these SCS/RTP plans.

**California Green Building Standards Code:** According to Chapter 7.94 of the City of Dublin's Municipal Code, bicycle parking and support facilities in both residential and non-residential development shall conform to the California Green Building Standards Code (CALGreen). The CALGreen Code includes both mandatory and voluntary measures. For non-residential buildings, it is mandatory that both short-term and long-term bicycle parking is provided and secure. Generally, the number of long-term bicycle parking spaces must be at least 5 percent of the number of vehicle parking spaces. Schools have additional requirements so both students and staff have access to sufficient bicycle parking.




**Caltrans Toward an Active California (2017)**: Toward an Active California is Caltrans's first statewide policy and plan to support bicyclists and pedestrians through objectives, strategies, and actions. Toward an Active California introduces 4 new objectives, 15 strategies, and 60 actions that are specific to active transportation and serve as the basis for Plan implementation.

**Caltrans District 4 Bike Plan (2018)**: This plan evaluates bicycle needs on and across the State transportation network and identifies priority bicycle projects. Projects are prioritized as top tier, mid tier, and low tier. The following projects are recommended for Dublin:

- **Top Tier Project**: Santa Rita Road and I-580 interchange reconstruction (ramps only); Class IIB facility
- **Mid Tier Project:** Tassajara Creek and I-580 new separated crossing; Alcosta Boulevard and I-680 minor interchange improvements (signage and striping); Class II facility
- **Low Tier Project:** Demarcus Boulevard and I-580 new separated crossing

**Caltrans District 4 Pedestrian Plan (2020)**: This plan identifies and prioritizes pedestrian needs along and across the State Highway System to inform future investments. The plan's main output is a prioritized list and map of location-based pedestrian needs and a toolkit with strategies to address those needs.

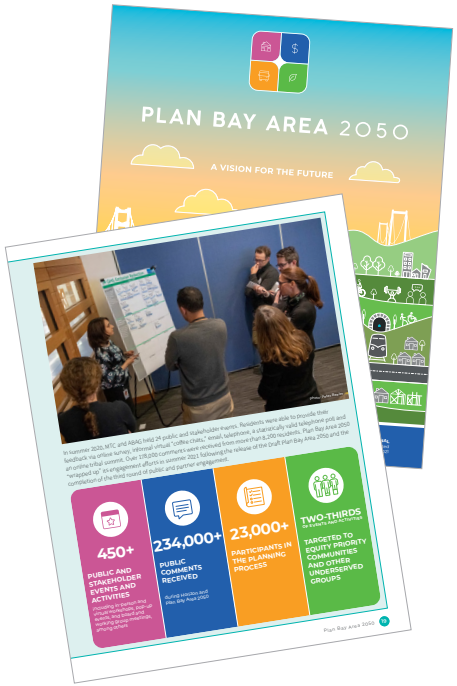
**Alameda Countywide Active Transportation Plan (2019)**: The 2019 Countywide Active Transportation Plan (CATP) updates and combines the Countywide Bicycle Plan and the Countywide Pedestrian Plan. The CATP analyzes low-stress bike networks, identifies a countywide high injury pedestrian and bicycle network, evaluates major barriers to the bicycle and pedestrian network, and establishes a framework for prioritizing projects of countywide significance to inform decision-making about active transportation funding at the Alameda County Transportation Commission. At the local level, the CATP provides resources to member agencies to help advance projects that provide complete, safe, and connected networks for biking and walking, including better connections to the regional transit network.

Connectivity analysis presented in the CATP indicate that the east planning area, which includes the City of Dublin, generally has poor low-stress connectivity in the rural and outlying suburban areas and in the business park portions of Dublin and Pleasanton. Based on the high-injury network analysis completed in the CATP, the combined bicycle and pedestrian high-injury network miles represent less than one percent of the total countywide high-injury network.

In the east planning area, Dublin Boulevard from Arnold Road to Hacienda Drive and Village Parkway from Davona Drive to Tamarack Drive have the highest bicycle collision severity scores. Dublin Boulevard was identified as the street with the most miles on the pedestrian high-injury network.

**The 2020 Countywide Transportation Plan (2020):** The 2020 Countywide Transportation Plan (2020 CTP) was adopted along with the Community-Based Transportation Plan and the New Mobility Roadmap. The 2020 CTP covers transportation projects, policies, and programs out to the year 2050 for Alameda County. The Community-Based Transportation Plan is an assessment of transportation needs in the county's low-income communities and communities of color with a focus on input collected via community engagement activities. The New Mobility Roadmap provides a foundation for agency policy, advocacy, and funding decisions to advance new mobility technologies and services for the Alameda CTC and partner agencies, as well as the private sector. The 2020 CTP 10-year priority project list includes the following projects in the City of Dublin: Iron Horse Trail Crossing at Dublin Boulevard, Downtown Dublin Streetscape Plan Implementation, West Dublin/ Pleasanton BART Station Active Access Improvements, Safe Routes to School Improvements, Interchange modernizations at I-580/I-680, I-580/Fallon/El Charro, and I-580/Hacienda, widening of Dougherty Road, Dublin Boulevard, and Tassajara Road and the extension of Dublin Boulevard




North Canyons Parkway. To complement these projects, the 10-Year Priority Projects and Programs, the 2020 CTP includes a series of Strategies that reflect guiding principles, industry best practices, and a gaps analysis of areas that aren't fully covered by projects: safe system approach, complete corridors approach, partnerships to address regional and megaregional issues, transit accessibility and transportation demand management, and new mobility and an automated, low-emission and shared future.

**MTC Plan Bay Area 2050 (2021)**: This plan from the Metropolitan Transportation Commission (MTC) is the region's long-range strategic plan. It is focused on the interrelated elements of housing, the economy, transportation, and the environment.

**MTC Active Transportation Plan (in progress, anticipated 2022)**: This forthcoming plan will guide investments in infrastructure and the development and implementation of regional policy. The plan supports the Plan Bay Area 2050 strategy to build a complete streets network and helps to meet goals to improve safety, equity, health, resilience, and climate change.

**East Bay Regional Parks District Master Plan (2013)**: This policy document guides future development of parks, trails, and services.

## LOCAL CITY PLANS AND POLICIES

**Streetscape Master Plan (2009)**: This master plan maximizes opportunities to craft an urban image unique to Dublin and opportunities to maintain existing amenities like street trees. Among other goals, the plan aims to coordinate improvements and responsibilities for Dublin's streets and to strengthening Dublin Boulevard's streetscape.

In the context of active transportation, this plan is a valuable resource for identifying and implementing street improvements that contribute to Dublin's image.

**Complete Streets Policy (City Council Resolution No. 199-12) (2012)**: The City of Dublin's Complete Streets Policy identifies complete streets planning as a critical contributor to:

- Increase walking, biking, and taking transit
- Reduce vehicle miles traveled
- Meet greenhouse gas reduction goals

Together, these targets aim to benefit public health. The policy emphasizes community engagement, sensitivity to land use and context, and coordination with nearby jurisdictions to connect infrastructure across city boundaries. The policy names several improvements

that should be considered to benefit all users of the street, including sidewalks, shared use paths, bike lanes and routes, and accessible curb ramps.

**Dublin Boulevard Bikeway Corridor and Connectivity Studies (2013)**: Completed in 2013, these two studies evaluated options for improving bicycling conditions on Dublin Boulevard, particularly in Downtown Dublin. A traffic analysis determined that removing a vehicle travel lane on Dublin Boulevard would delay transit service and worsen traffic during peak periods. Community members and local business owners expressed concern that this change would be a barrier to visiting Downtown Dublin by car. Ultimately, a shared-use path running alongside Dublin Boulevard and connecting to the Alamo Canal Trail became the long-term vision for bicycling in Dublin. In the interim, the City added sharrows (a Class III facility) to Dublin Boulevard between Dublin Court and Tassajara Road and permitted riding on sidewalks to make bicycling a more comfortable experience for all skill levels.




*Entrance to Iron Horse Trail*

**Pedestrian Safety Assessment (2014)**: The University of California, Berkeley Institute of Transportation Studies Technology Transfer Program prepared this assessment for the City of Dublin in 2014. The assessment authors compared different types of collisions that occurred in Dublin with other cities in California and found that Dublin has a relatively high number of collisions involving pedestrians—particularly young and old pedestrians—and collisions involving high vehicle speeds. Opportunities to improve walking conditions in Dublin include traffic calming programs, transportation demand management policies and programs, and coordination with health agencies. This assessment also included specific areas of Dublin where improvements could benefit pedestrian conditions. The updated bicycle and pedestrian plan reviewed these key areas.

**Dublin Bicycle and Pedestrian Plan (2014)**: Adopted in 2014, Dublin's 2014 Plan established key goals and policies to maintain and improve biking and walking infrastructure. The plan's goals and policies support its vision for Dublin

The 2014 Plan inventoried the bicycle and pedestrian network and documented potential improvements to specific facilities. The plan organized infrastructure projects at key locations into four tiers by priority and intended to actualize the proposed biking and walking network. Programming opportunities to attract biking and walking trips are also identified in the 2014 Plan. In addition to listing potential funding sources for

project implementation, the 2014 Plan includes bicycle and pedestrian design guidelines that apply national resources and best practices to project implementation in Dublin.

**General Plan Circulation & Scenic Highways Element and Schools, Public Lands, & Utilities Element (2014)**: The General Plan's Land Use & Circulation elements focus on meeting the mobility needs of all roadway users by any mode and aligns with two key documents: the City of Dublin's Complete Streets Policy and the Tri-Valley Transportation Plan (a regional plan). The element promotes the use of local and regional trails and emphasize improving experiences walking and taking transit. The elements prioritize two areas for active transportation investments: the Eastern Extended Planning Area and Downtown Dublin.

The elements' guiding policies that are the most relevant to the Plan include:

- 5.3.1.A.3—Encourage improvements in the Enhanced Pedestrian Areas to improve the walkability of these areas.
- 5.5.1.A.1—Provide safe, continuous, comfortable, and convenient bikeways throughout the city.
- 5.5.1.A.2—Improve and maintain bikeways and pedestrian facilities and support facilities in conformance with the recommendations in the Dublin Bicycle and Pedestrian Plan.
- 5.5.1.A.3—Enhance the multimodal circulation network to better accommodate alternative transportation choices including BART, bus, bicycle, and pedestrian transportation.
- 5.5.1.A.4—Provide comfortable, safe, and convenient walking routes throughout the city and, in particular, to key destinations such as Downtown Dublin, BART stations, schools, parks, and commercial centers.

**Parks and Recreation Master Plan (2022)**: The Parks and Recreation Master Plan (PRMP) establishes goals, standards, guiding policies, and an action plan to guide the City of Dublin in the acquisition, development, and management (operations and maintenance) of Dublin's park and recreation facilities through the ultimate build-out of the City in accordance with the General Plan. This PRMP update addresses the program and facility needs of the anticipated future population growth. The development standards for new parks and facilities are intended to provide for quality parks, trails, sports fields and recreation and cultural facilities needed at build-out in a manner that is fiscally sustainable to operate and maintain. Relevant goals and objectives include exploring improving/adding bike paths and walking trails, and continuing to maintain and improve existing facilities, parks, trails, and open spaces. The standards and criteria for the City's parks and recreation facilities include requirements for bicycle parking, paving, and width.

**Iron Horse Regional Trail Feasibility Study (2017)**: Based on a multimodal assessment and community outreach processes, this Feasibility Study arrives at several key preferred alternatives for the Iron Horse Regional Trail and its crossings on Dougherty Road, Dublin Boulevard, and the West Dublin/Pleasanton BART Station. A multi-use trail separating people walking and biking was preferred; a bicycle/pedestrian bridge was preferred for crossing Dublin Boulevard,

while an at-grade crossing was preferred for Dougherty Road. Improvements near the BART station are intended to both enhance access to transit and improve experiences for trail users passing through the station area. Improvements to the Iron Horse Regional Trail contribute to this Plan by making use of the Trail easier and more convenient.

**Traffic Safety Study Update (2018)**: Collisions were studied in the 2018 Traffic Safety Study Update (Safety Study) to evaluate safety performance on specific street sections and intersections. Overall, collisions had increased at the time of the Safety Study, likely as a result of population increases and people living and driving in Dublin, particularly East Dublin. Recommendations in the Update include continuous bicycle lanes at Central Parkway and Tassajara Road. The collision analysis included in this Plan supplements the findings and recommendations of the Safety Study.

**Climate Action Plan 2030 and Beyond (2020)**: The Climate Action Plan 2030 and Beyond, establishes the City's vision for reducing greenhouse gas (GHG) emissions by 2045. The CAP names transportation as the largest source of emissions in Dublin and lays a plan for Dublin to become carbon neutral by 2045. Zero-emission vehicles and mode shift to biking, walking, and transit trips are key strategies to reduce Dublin's GHG emissions and meet citywide targets. The CAP sets measures to develop plans and programs around transportation demand management, transit-oriented development, parking management, and electric vehicle infrastructure planning to support mode shift and electrification of Dublin's vehicle fleet. A shift to alternative, active, shared, and electric mobility will provide safer routes between home, transit stops, and other community amenities, reduce GHG emissions, reduce traffic congestion, improve public health outcomes, and have economic benefits.




**City of Dublin Streetscape Master Plan (2020)**: The Downtown Streetscape Master Plan provides direction for public and private investment, specifically in regard to the development of the public realm and Downtown's identity. One of the plan's key goals is to develop pedestrian-oriented environments on Commercial Throughways and on Downtown Local Streets. On these roadways as well as on Crosstown Boulevards and Parkways, the plan also emphasizes providing safe and comfortable facilities and crossings for people walking and biking. Recommended improvements within the Downtown area are prioritized into four tiers that can be matched to project scale, budget, funding source, and other opportunities. Tier 1 and Tier 2 street and pedestrian enhancements are illustrated on Figures 24, 25, and 27 and include restriping/road diet evaluation, sidewalk widening, intersection and mid-block crossing treatments, as well as art and wayfinding opportunities. Notable guidelines include widening sidewalks to provide a minimum 12-foot sidewalk with minimum five- to six-foot clear throughway zone for walking.

## Specific Plans

Four areas of Dublin have specific plans that outline guiding principles, policies, and design guidance related to active transportation: Dublin Crossing, Downtown, the Dublin Village Historic Area, and Eastern Dublin.

**Dublin Crossing (2013):** This Specific Plan focuses on improving east-west connectivity in the Dublin Crossing, particularly between transit stops, destinations, and trails. A relevant guiding principle in this Specific Plan is to make it easier and more convenient for people to access and use the Iron Horse Regional Trail, the West Dublin/ Pleasanton BART Station, and retail destinations without a car.

**Downtown Specific Plan (2014)**: Guiding principles, pertinent to biking and walking in Downtown, aim to create pedestrian-friendly streets, enhance multimodal travel options, and cultivate pedestrian connections to retail destinations. Transit-oriented development and lighting should be scaled to people walking in Downtown. Pedestrian connectivity between buildings, parking, and sidewalks should be maintained throughout Downtown, and pedestrian amenities like street furniture are encouraged.

**Dublin Village Historic Area (2014)**: Placemaking, creating a positive experience for people walking, and attracting people to this area are key goals of this Specific Plan. Creating positive experiences for people walking includes providing more crosswalks and median refuges, calming vehicle traffic, adding pedestrian amenities or a plaza, and implementing pedestrian-scale lighting and wayfinding.

**Eastern Dublin (2016)**: A key goal in the Eastern Dublin Specific Plan is to reduce reliance on single-occupancy vehicles by planning the area's land uses to naturally promote walking, biking, taking transit, and ridesharing. Notably, development with a higher intensity is encouraged near transit corridors in Eastern Dublin. Relevant policies in this Specific Plan include:

- Providing sidewalks in the Town Center and Village Center
- Requiring development to balance pedestrian, bicycle, and automobile circulation
- Creating a north-south trail along Tassajara Creek and other streams
- Establishing a bike network that meets both travel needs and recreational opportunities
- Providing bicycle parking at key destinations

**Green Stormwater Infrastructure Plan (2019)**: The purpose of the City's Green Stormwater Infrastructure Plan (GSI) is to describe how the City will meet requirements specified in the Municipal Regional Stormwater National Pollutant Discharge Elimination System Permit (MRP), Order No. R2-2015- 0049, NPDES Permit No. CAS612008 issued on November 19, 2015. This GSI Plan demonstrates how the City is meeting MRP requirements and intends to use GSI to enhance the urban environment.

**Local Roadway Safety Plan (anticipated 2022)**. The Local Roadway Safety Plan (LRSP) provides a framework to identify, analyze, and prioritize roadway safety improvements on local roads.

**Americans with Disabilities Act Transition Plan (anticipated 2022)**. The ADA Transition Plan is a formal document outlining the City's compliance with ADA.

# VISION, GOALS, & PERFORMANCE MEASURES

To set a clear path forward, City staff and the Technical Advisory Committee (TAC) members outlined the City's purpose, vision, and goals for this Plan.

## PROJECT VISION

This Plan sets forth the following vision:

### VISION STATEMENT

*The City of Dublin is a vibrant place where walking and biking are safe, comfortable, and convenient ways to travel. In Dublin, walking and biking connects individuals, inclusive of all ages and abilities, to local and regional destinations.*

## GOALS

This Plan establishes the following five overarching goals related to the vision that guide recommendations:

1. **Enhance Safety**
   Prioritize safety in design and implementation of walking and biking facilities.

2. **Increase Walking and Biking**
   Support biking and walking as attractive modes of transportation.

3. **Improve Connectivity**
   Develop a bicycle and pedestrian network that provides well-connected facilities for users of all ages and abilities.

4. **Enhance Accessibility**
   Utilize principles of universal design to make biking and walking a viable transportation option for all, including people with disabilities.

5. **Prioritize Investments**
   Maintain sufficient funding to provide for existing and future bicycle and pedestrian needs, including program support, operation, and maintenance. Leverage biking and walking projects to promote economic activity and social equity in the community.

## PERFORMANCE MEASURES

Setting performance measures helps track progress toward goals and document the results of investments in biking, walking, and rolling. The following performance measures and desired trends have been established to track progress towards achieving the goals of this Plan:

| Goal | Performance Measure (Desired Trend)* |
|---|---|
| **Enhance Safety** | • Decrease vehicle travel speed measured at specific locations<br>• Decrease number of pedestrian and bicycle collisions<br>• Reduce severity of pedestrian and bicycle collisions<br>• Increase users' perception of safety<br>• Decrease average crossing distances |
| **Increase Walking and Biking** | • Increase walk/bike/roll to school mode share<br>• Increase walk/bike/roll to work mode share<br>• Increase walk/bike/roll to transit mode share<br>• Increase walk/bike/roll to recreational facilities |
| **Improve Connectivity** | • Reduce bicycle level of traffic stress<br>• Decrease number and length of sidewalk gaps<br>• Increase number of crossing opportunities<br>• Increase length of sidewalks that exceed minimum width requirements<br>• Increase the number of secure bike parking spaces |
| **Enhance Accessibility** | • Increase the number of traffic signals with audible cues<br>• Increase the number of intersections with directional curb ramps and detectable warning surfaces<br>• Decrease number and length of sidewalk gaps<br>• Increase length of sidewalks that exceed minimum width requirements<br>• Decrease length of sidewalks that are broken or in disrepair |
| **Prioritize Investments** | • Maintain and increase sustainable funding mechanisms and a dedicated funding source to build a complete streets network<br>• Maintain a maintenance plan for bicycle and pedestrian facilities<br>• Increase funding for bicycle and pedestrian projects as a percentage of total transportation infrastructure spending |

**not in order of importance*



# 2

# 2. COMMUNITY & STAKEHOLDER ENGAGEMENT

Inclusive and meaningful community and stakeholder engagement is necessary to create a Bicycle and Pedestrian Plan that is community-suported and implementable. A community and stakeholder engagement plan was developed at the outset of the planning process to outline the activities, methods, and tools that would be used to engage the Dublin residents and key stakeholders. The community and stakeholder engagement plan established a framework and identified opportunities and specific milestones for sharing information, soliciting feedback, and collaborating with agency stakeholders and Dublin community members.

## ENGAGEMENT AND COVID-19

Due to the outbreak of Coronavirus disease (COVID-19) and the resulting stay-at-home order initiated on March 17, 2020 in Alameda County that affected the ability to conduct in-person engagement, a hybrid approach was used. Primarily digital outreach methods were used with in-person engagement when possible to safely and effectively reach a broad audience.

## ENGAGEMENT ACTIVITIES

To better understand Dublin's walking and bicycling issues and opportunities, stakeholders and community members were engaged through the following methods:

The engagement timeline is shown in Figure 5, and specific activities are described in this section.

- Project website
- Interactive map
- Public survey
- Public workshop
- Pop-up events
- Stakeholder meetings
- Technical Advisory Committee meetings
- Bicycle and Pedestrian Advisory Committee meetings

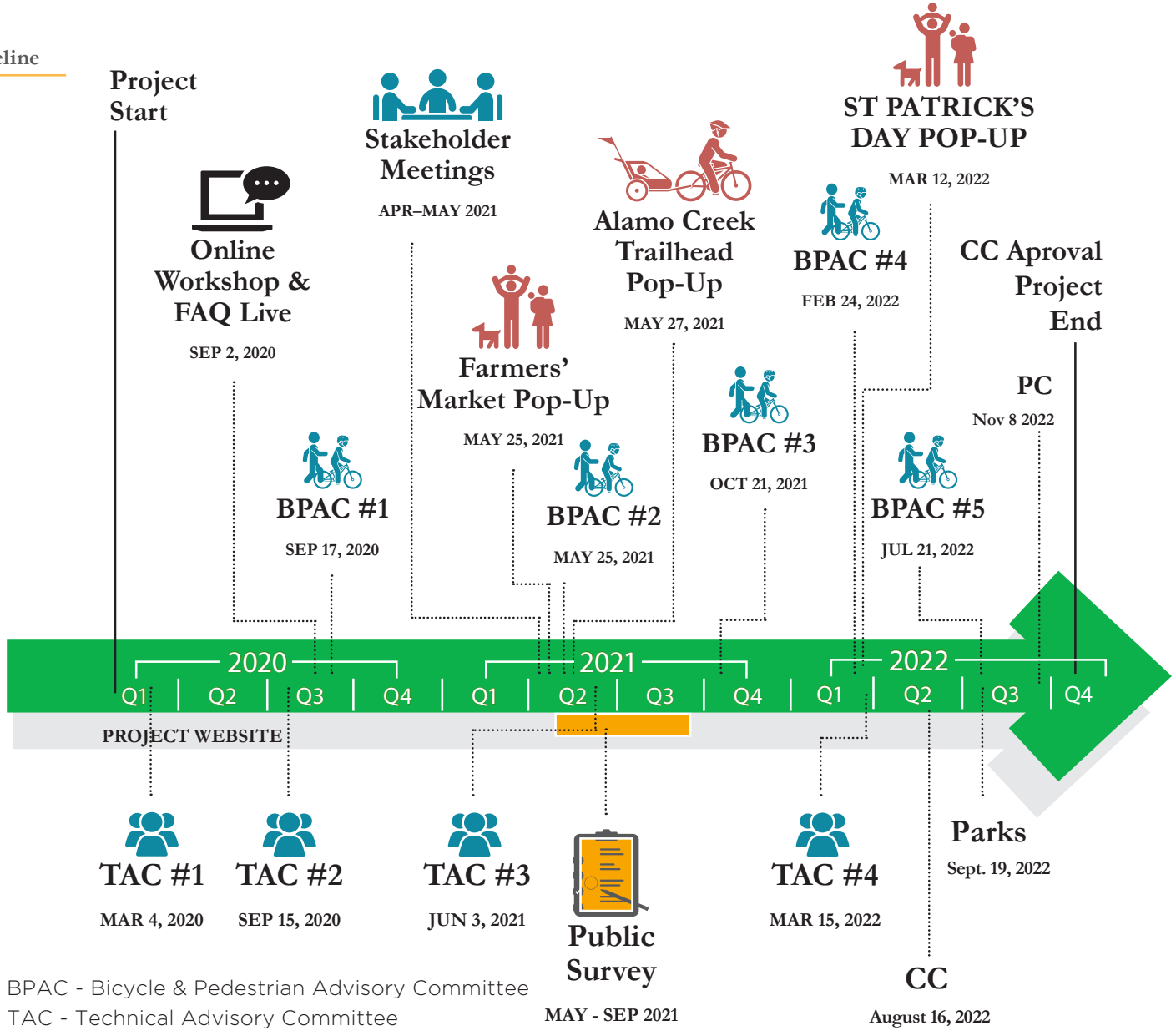






*Photos from pop-up events at the St Patrick's Day Festival and Alamo Creek Trailhead*

Figure 6. Public Engagement Timeline




BPAC - Bicycle & Pedestrian Advisory Committee
TAC - Technical Advisory Committee
CC - City Council
PC - Planning Commission
Parks - Parks Commission



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# COMMUNITY FEEDBACK AND FINDINGS

Community feedback and findings are presented in this section. Select quotes from community members are presented throughout the Plan document. Supporting materials are included in appendix A.

## PROJECT WEBSITE AND INTERACTIVE MAP

An interactive website was created to share key project milestones and provide information about the Plan development and events. Since going live in March 2020, the project website has received approximately 1,500 visits (with 2.7 actions per visit), 3,700 page views, and 123 data downloads.

The website also included an interactive online map on which the public could identify desired improvements, gaps, and key destinations in the existing bicycle and pedestrian network. The online map received a total of 208 comments.

Map feedback was classified into four categories: barriers, ideas, praise, and questions (Figure 7). Nearly half of responses indicated a **barrier** to walking or biking, and another third offered an **idea** to improve walking and biking conditions. The remaining responses were either **praise** for actions the City has taken to create a safe and connected active transportation network and promote sustainable transportation options or **questions** about the Plan or planning process. Responses were analyzed to identify central themes for each of the four categories.

### BARRIERS

Themes for each of the response categories were generated from the subject matter of received comments to summarize the most common kinds of community input. The top five themes in the barriers category are shown in Figure 8 and listed in ranked order below.

Figure 7. Web Map Comments by Category

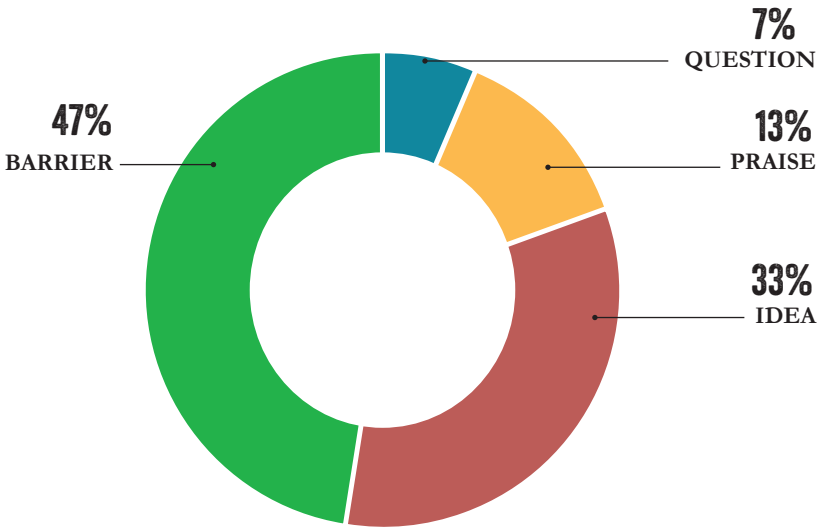
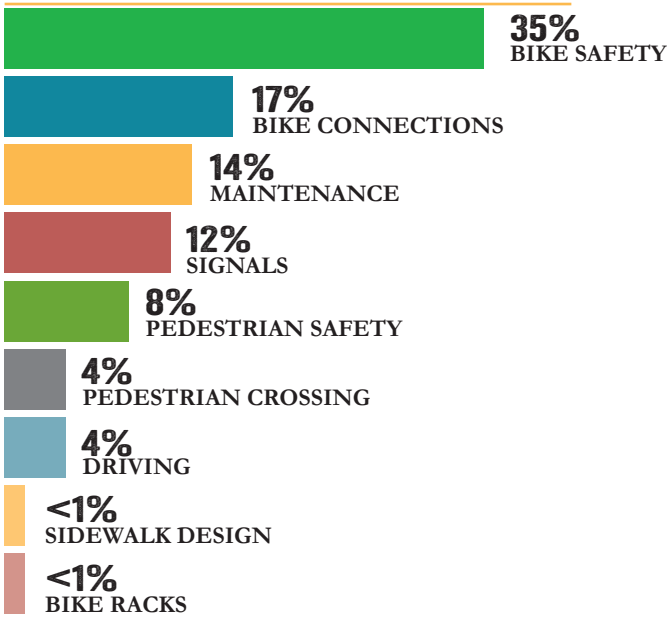
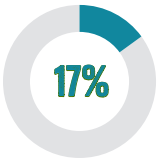



Figure 8. Barrier Themes in Comments






**Bike Safety.** Comments that discussed bike safety largely focused on a need for greater separation between bikes and vehicles, traffic calming, lack of bike lanes, and concerns about biking near on- and off-ramps.




**Bike Connections.** Comments that discussed bike connections largely focused on consistent connections to paths, across over and under passes, and main bike routes.




**Maintenance.** Comments that discussed maintenance largely focused on poor road conditions, debris in the road, and broken sidewalk.




**Signals.** Comments that discussed signals largely focused on issues with signal bike detection at intersections.




**Pedestrian Safety.** Comments that discussed pedestrian safety largely focused on dangerous crossings.



## IDEAS

Community members also offered ideas. The top four themes of these ideas are shown in Figure 9 and are listed in ranked order:

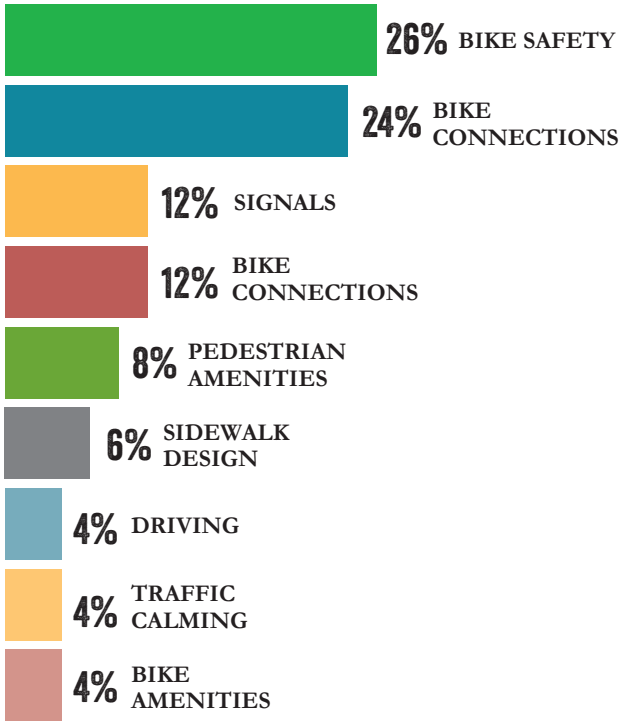



**Bike Lanes.** Comments that discussed bike lanes largely focused on a need for greater connections between important destinations and along major roads and trails.




**Pedestrian Connections.** Comments that discussed pedestrian connections largely focused on improving specific sidewalk connections and creating walking paths.

Figure 9. Idea Themes in Comments




## MOST COMMON BARRIER LOCATIONS MENTIONED

In addition to the most common themes, there were also common locations identified by community comments. The top five locations for comments noted as barriers were:



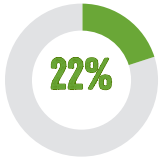
1. DUBLIN BOULEVARD
2. TASSAJARA ROAD
3. FALLON ROAD
4. AMADOR VALLEY BOULEVARD
5. DOUGHERTY ROAD




**Signals**. Comments which discussed signals largely focused on safer intersections through changes to signals timing.




**Bike Connections** Comments that discussed bike connections largely focused on connecting bike trails and lanes to key destinations and each other.




**Other** The remaining in the ideas category covered pedestrian amenities, sidewalk design, driving, traffic calming, and bike amenities.

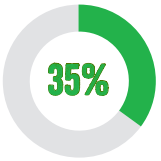


## PRAISE

Respondents praised several key features of Dublin's existing walking and biking network as well as the City's ongoing efforts to improve it. The top three themes in the praise category are shown and listed in rank order in Figure 10.



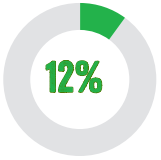

**General.** Comments that were general were focused on appreciation for the City's efforts to improve bike and pedestrian facilities.




**Bike Lanes.** Comments that discussed bike lanes were focused on effective plastic barriers, separated bike paths, and green paint.




**Signals.** Comments that discussed signals were focused on flashing lights at intersections and well-placed crossing buttons.




**Other** The remaining comments in the praise category covered existing amenities and connections.

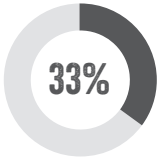


## QUESTIONS

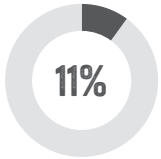
Three key question themes emerged from the online map responses; they are listed below and illustrated in Figure 11.




**Planning Process.** Questions about the planning process had to do with the reach of the survey, how funding is being used efficiently, and how the City plans to finish certain projects.




**Connections.** Comments which discussed bike and walk connections asked about projects at specific locations, including whether they were planned or if they can be added to the City's efforts.




**Micromobility.** Questions about micromobility focused on legal operating requirements, including whether electric scooters are allowed on bike paths about whether electric scooters are allowed on bike paths.

Figure 10. Praise Themes in Comments

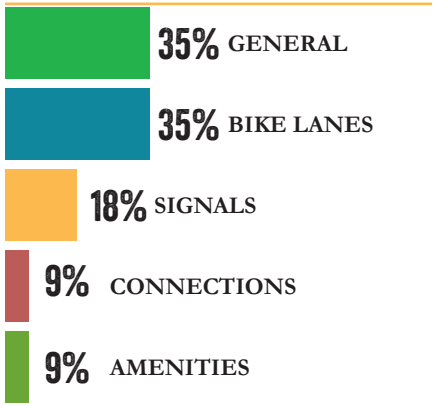
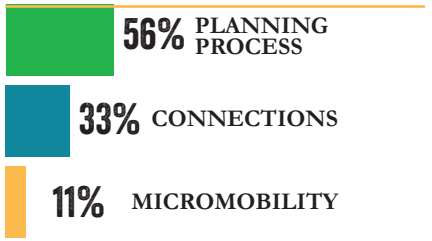



Figure 11. Question Themes in Comments



# PUBLIC SURVEY

A public survey was used to collect information from the public about their personal transportation preferences, travel habits, and issues and opportunities related to walking and biking in Dublin. The public survey was distributed in Summer 2020 and was promoted on social media and posted to the website. A fact sheet with the survey link and QR code was provided at the Alamo Creek Trailhead and Farmers' Market pop-up events. Approximately 200 responses were received to the 17-question survey, which covered travel behavior and mode preference; travel to school; challenges and barriers to moving around Dublin; and priorities for investments related to walking and biking.



**200**
**RESPONSES**
were received to the 17-question survey

## SURVEY RESULTS

### General Travel Behavior and Mode Preferences

When asked about modes taken to work and school prior to the COVID-19 pandemic, 33 percent of respondents said they drove alone, 17 percent used a bike or scooter, and 17 percent walked. These numbers stayed relatively constant when respondents were asked about the same behaviors during COVID. The top reason (22 percent) respondents gave when asked why driving to work was the best option was that driving alone was the quickest and most convenient option. Around 10 percent of respondents indicated safety, irregular work schedules, and the need to make additional stops as reasons they chose to drive alone to work. Of respondents who use a combination of travel modes, there were a similar number of respondents across modes.

### Travel to School

Approximately 38 percent of respondents had school-age children. Of those respondents, approximately 40 percent indicated that they used a personal vehicle for school drop-off/pick-up. Another 26 percent walked to school while 14 percent biked. Respondents indicated the top three factors discouraging walking or biking to school were safety concerns (35 percent), distance or travel time (18 percent), and lack of sidewalks or curb ramps (13 percent).

### Barriers to Walking and Biking

When asked about barriers to walking and biking, respondents indicated that safety was a primary consideration, followed by vehicle speed. Responses were mixed on the topics of street lighting and maintenance, with a fairly even split of people indicating it was either not important, somewhat important, or very important. Most respondents were less concerned with distance to their destinations or available shade.

### Investment Priorities

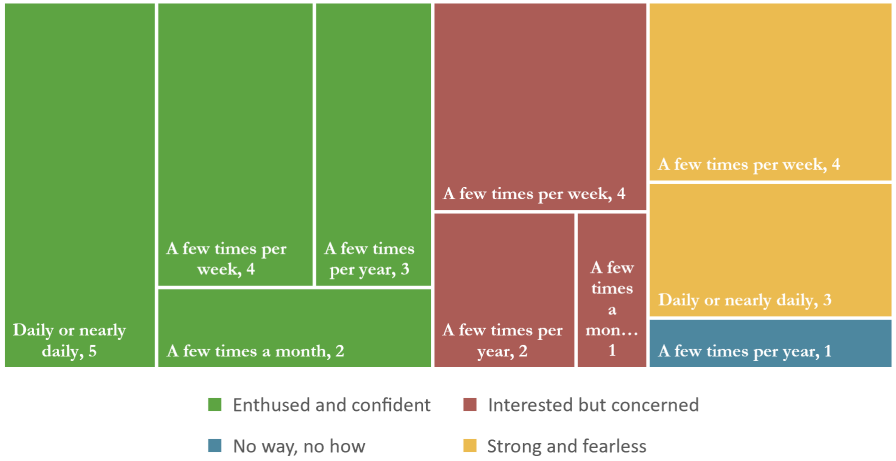
When asked what types of improvements would encourage walking or biking, 22 percent of respondents indicated better/more sidewalks and trails, 14 percent indicated better/more bicycle facilities, 11 percent indicated slower vehicles and more traffic calming, and 10 percent indicated better maintenance of existing facilities. When asked where the City should prioritize walking and biking improvements, the top three responses (about 20 percent each) were high collision locations; routes connecting people to schools, libraries, parks, and other key destinations; and, along and across busy streets.

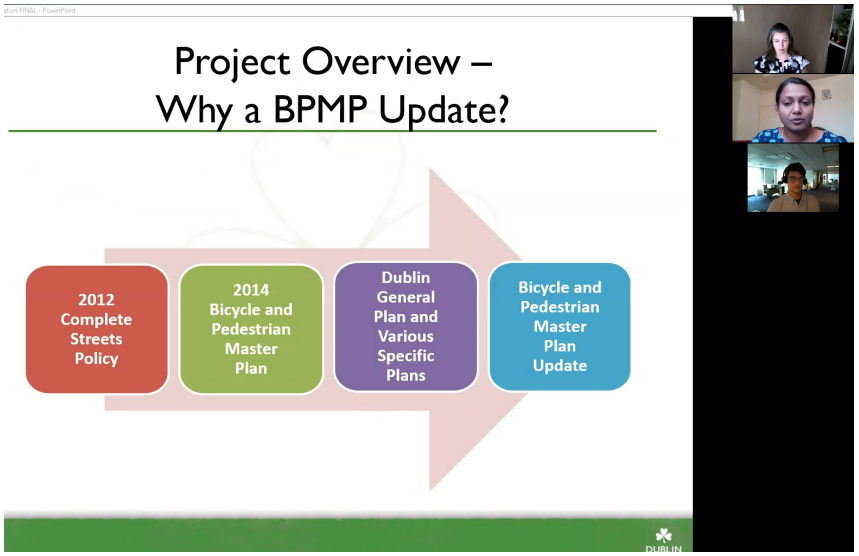
# PUBLIC WORKSHOP

On September 2, 2020 a digital workshop was held via Zoom to inform the public about the Plan and gather broad community feedback. Forty-two people attended the hour-long Zoom workshop, which included a presentation and a question-and-answer period.

This workshop aimed to establish a community understanding of the planning process and to obtain feedback on the project's vision and goals. The workshop also included a poll, which asked

Figure 12. Poll Responses to Classification of Bicyclist Types by Frequency of Bicycle Use




participants questions about their experiences on public streets, their comfort with various modes of micromobility, and their demographic information.

The workshop also included a poll asking participants about their experiences walking, biking, and using micromobility on public streets, whether they feel comfortable using these modes in Dublin, and whether they would want to see bike and scooter share programs in Dublin. The poll received 30 responses. Participants of the poll were also asked how they classify themselves in terms of confidence using a bike in Dublin, as well as how often they ride a bike. Of the responses, the most common confidence level was Enthused and Confident (47 percent), followed by Interested but Concerned (27 percent), Strong and Fearless (23 percent), and No Way, No How (3 percent) (see Figure 12).

## POP UP EVENTS

Feedback was gathered at three in-person events to understand where people walk and bike and what issues, concerns, ideas, and priorities they have related to walking and biking in Dublin.

### FARMERS' MARKET—25 MAY, 2021

Feedback was gathered on existing conditions and needs. Approximately 40 people provided input, and participants were rewarded with Carrot Cash and giveaways.

### ALAMO CREEK TRAILHEAD—27 MAY, 2021

Dublin partnered with Bike East Bay in an effort to hear from trail users at the Alamo Creek Trailhead as part of National Bike Month Activities. Feedback was gathered in real time and flyers with the public survey link were handed out.

### ST. PATRICK'S DAY FESTIVAL—12 MARCH, 2022

Feedback was gathered on the draft network recommendations and additional comments on program and policy priorities for walking and biking in Dublin. The St. Patrick's Day Festival in Dublin is one of the biggest local community events of the year. This two-

day celebration brings out thousands of engaged residents and visitors per day, making it an important opportunity for the City of Dublin to communicate its plans and receive feedback. The celebration had an added importance this year as this would be the first in-person public event of this scale in Dublin since 2019, making for an excited and engaged audience. Approximately 136 community members provided feedback on possible infrastructure improvements for pedestrians and bicyclists in Dublin, and this pop-up resulted in 231 unique data points.



*Alamo Creek Pop Up Event*

## BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE MEETINGS

The Alameda County Transportation Commission (Alameda CTC) Bicycle and Pedestrian Advisory Committee (BPAC) involves interested community members in Alameda CTC's policy, planning, and implementation efforts related to bicycling and walking. The Alameda CTC BPAC includes representatives from cities in Alameda County, including Castro Valley, Dublin, Fremont, San Leandro, Berkeley, Hayward, Oakland, Albany, and Alameda and serves as Dublin's advisory body as Dublin does not currently have a local BPAC.

The Dublin Bicycle and Pedestrian Plan Update was brought to the Alameda CTC BPAC five times during the project. The group provided feedback on key items throughout the planning process, including the technical analysis approach and findings and program, policy, and project recommendations. Comments were addressed and incorporated into the Plan document. Meeting summaries and supporting materials are included in appendix A.

## TECHNICAL ADVISORY COMMITTEE MEETINGS

A Technical Advisory Committee (TAC) was formed to provide key guidance on the Plan. The TAC included staff from City departments, including Planning, Economic Development, and Parks & Community Service and other agency representatives from Dublin Unified School District, Dublin Police Services, Alameda County Fire Department, San Ramon, Pleasanton, Livermore, Alameda CTC, Caltrans, BART, and LAVTA.

The team hosted five TAC meetings over the course of the project. The Plan process, community engagement, existing conditions and needs analysis, prioritization framework, and program, policy, and project recommendations were discussed during these meetings. Comments were addressed and incorporated into the Plan document. Meeting summaries and supporting materials are included in appendix B.



# 3

# 3. WALKING & BIKING IN DUBLIN TODAY

This chapter provides an overview of walking and biking in Dublin and presents results of the existing conditions and needs assessment, which includes relevant demographic data, existing walking and biking infrastructure, high injury bicycle and pedestrian network, and bicycle level of traffic stress analysis. This inventory and analysis of existing citywide conditions sets the stage for identifying strategic pedestrian and bicycle investments and informs the prioritization process and network recommendations presented in chapter 4.

**Dublin Population: 61,240**

*Source: US Census American Community Survey Five-Year Estimates (2015-2019)*

## LIVING AND WORKING IN DUBLIN

This section discusses demographics and transportation data including race/ethnicity, age, gender, mode share, and worker inflow and outflow patterns. The purpose of this information is to provide background and context describing people living and working in Dublin as it relates to walking and biking.

The data presented is obtained from the California Communities Environmental Health Screening Tool (CalEnviroScreen), Longitudinal Employer-Household Data (LEHD) from 2017, and the American Community Survey five-year estimates (2015–2019) from the US Census.

## RACE & ETHNICITY

The most common racial background of Dublin residents is Asian alone (49 percent) and White alone (39 percent). Approximately 6 percent of Dublin residents identify as being two or more races, and 4 percent of residents identify as Black/African American alone. Approximately 10% of Dublin residents identify as hispanic or latino/a/x. Dublin's population by race & ethnicity is illustrated in Figure 13.

## GENDER

Dublin has an almost 50/50 split of people self reporting as females vs males. Note that American Community Survey data is not available for gender identity for the years covered by this Plan.

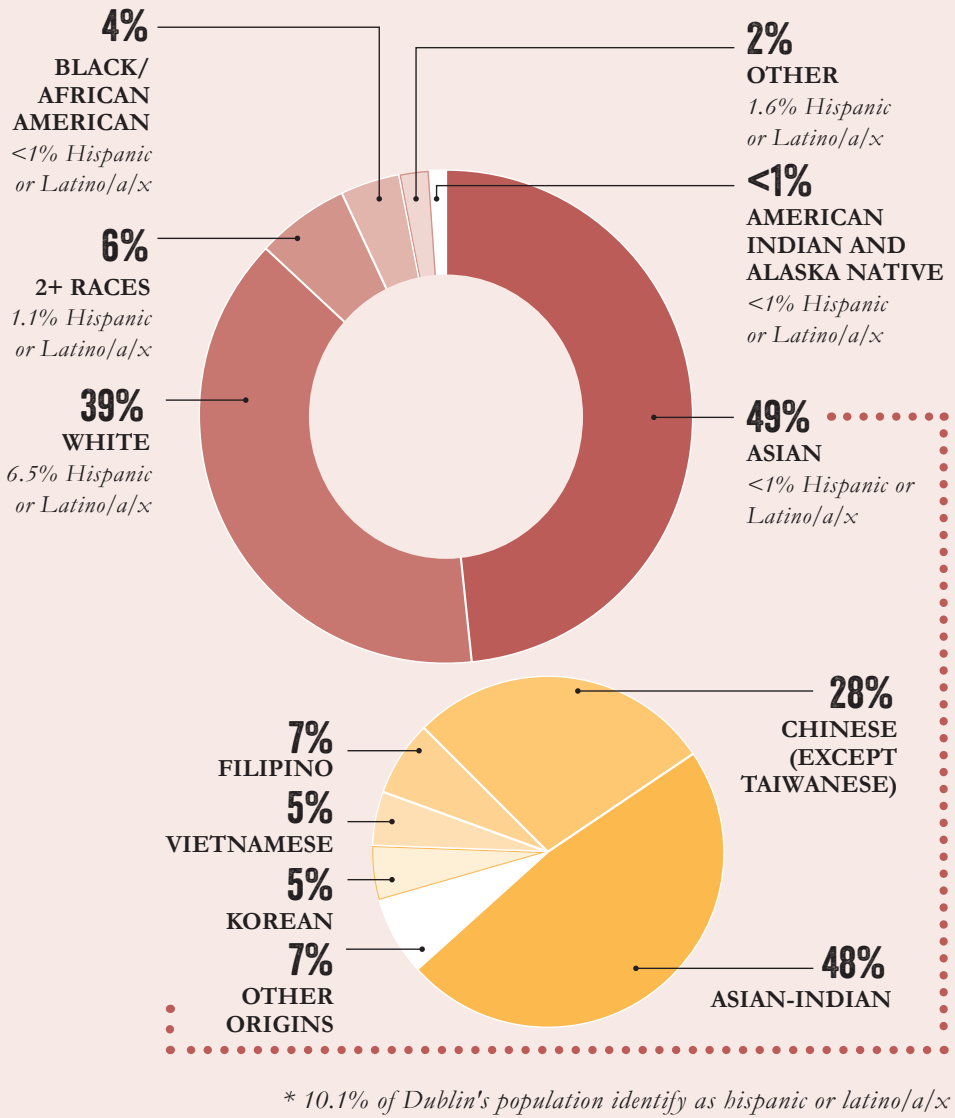
## AGE

The most common ages of Dublin residents are 25–44 (40 percent) and 45–64 (24 percent). Combined, ages 25–64 make up 64 percent of the population. The Dublin population younger than 15 accounts for 24 percent of the total population, while the population over 65 makes up 9 percent. Figure 13 illustrates Dublin's population by age.

## ZERO-VEHICLE HOUSEHOLDS

When compared with the surrounding Alameda County, Dublin has a lower proportion of households without vehicles. Overall in Alameda County, 10 percent of households do not have a vehicle; in Dublin, 3 percent of households do not have a vehicle.

Figure 13. Dublin Population by Race & Ethnicity




** 10.1% of Dublin's population identify as hispanic or latino/a/x*

Figure 14. Dublin Rounded Population by Age

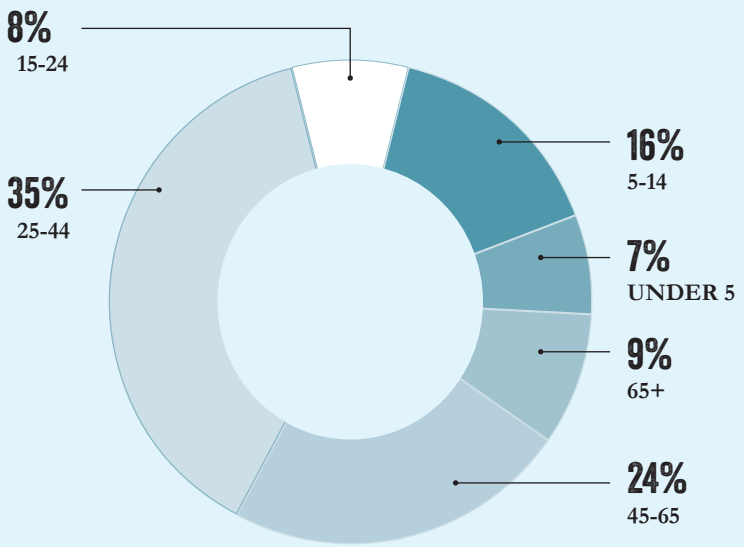



Figure 15. Dublin Population by Gender



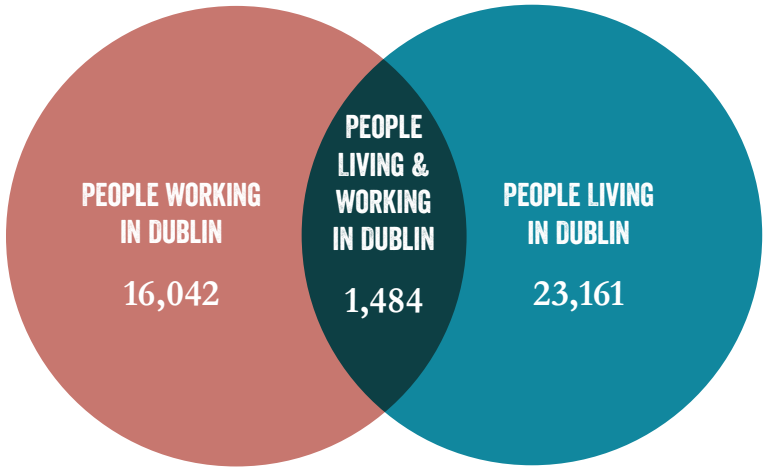
**50/50***

OF RESIDENTS

FEMALE AND MALE

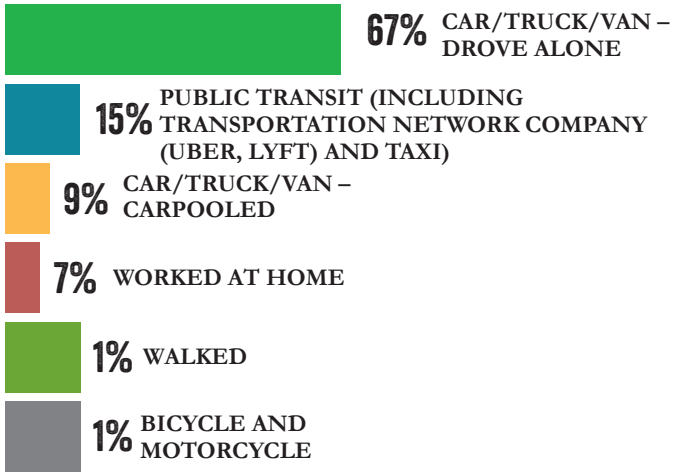
**gender identity data is not available*

Figure 16. Workers by Residence and Job Location




*Source: Longitudinal Employer-Household Dynamic (LEHD), 2017.*

Figure 17. Commute Mode




*Source: US Census American Community Survey Five-Year Estimates (2015–2019).*

## WORKERS

Based on the most recent LEHD data available (2017), the net inflow and outflow of Dublin workers is the following:

- 16,042 people live elsewhere and commute into Dublin
- 23,161 people live in Dublin and commute elsewhere
- 1,484 people live and work in Dublin

Only about 6 percent of workers living in Dublin also work in Dublin.

## COMMUTE MODE SHARE

Working Dublin residents use various modes to travel to work (see Figure 17). The commute data shown below provides a basic understanding of how people travel to and from work. However, because the data comes from the US Census—which only provides journey-to-work data for the primary mode of transportation—information on other trips, such as walking or biking to connect to public transit, are not represented.

Approximately 76 percent of Dublin residents commute to work by car, either alone (67 percent) or in a carpool (9 percent). Public transportation is the second most popular way to commute at 15 percent. Walking represents approximately 1 percent of commute modes. Biking and riding a motorcycle each represent less than 1 percent of all commute modes. Additionally, about 7 percent of working Dublin residents worked from home.

## COMMUTING & COVID-19

The COVID-19 pandemic has drastically transformed the commuting and transportation landscape as restrictions on non-essential travel forced everyone into unplanned lifestyle changes. As we look to the future, it is unclear how COVID-19 will change commuting and teleworking patterns. Findings

from current research indicate that teleworking will increase relative to pre-COVID-19 conditions and people will be more likely to walk/bike/drive and less likely to take transit.[1]

## BART STATION ACCESS

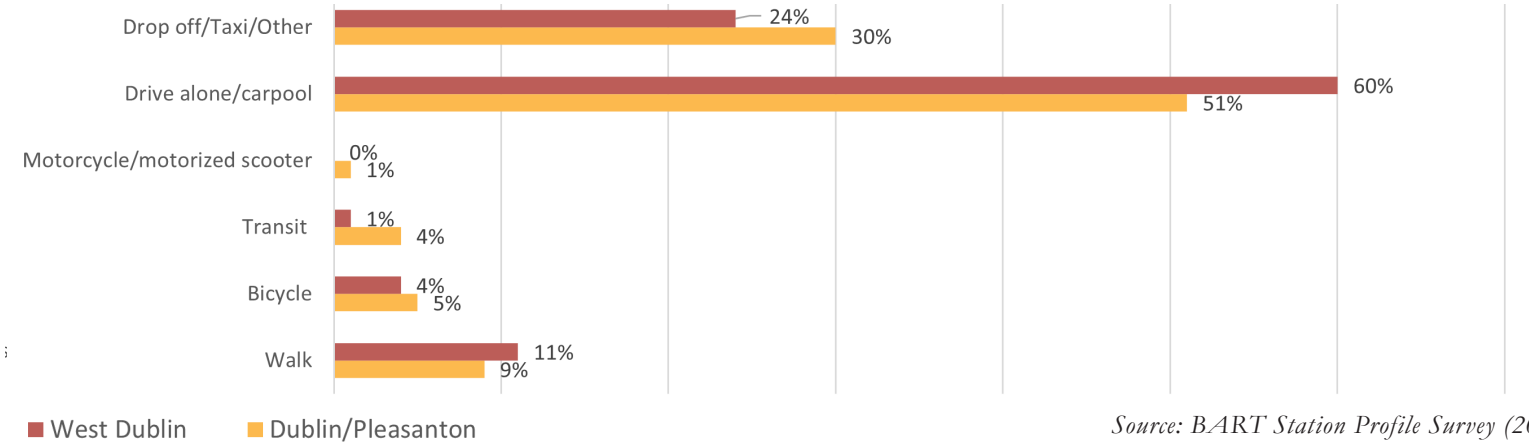
There are two BART stations in Dublin: the West Dublin/ Pleasanton BART Station and the West Dublin BART Station. Based on the ridership data presented in BART's Station Profile Survey (2015), there were approximately 8,000 daily station entries at the West Dublin/Pleasanton BART Station and 3,700 daily station entries at the West Dublin BART Station. As shown in Figure 18, 9 percent of riders walk and 5 percent of riders bicycle to the West Dublin/ Pleasanton BART Station; 11 percent of riders walk and 4 percent of riders bicycle to the West Dublin BART Station. A total of 68 shared-use electronic lockers operated by BikeLink are provided at the West Dublin/ Pleasanton BART Station, and 56 lockers are provided at the West Dublin BART Station.

With almost 15 percent of residents using public transportation to get to work, there is an opportunity to encourage more people to walk and bike to BART. This can be accomplished by focusing on convenient, safe first-mile and last-mile connections to these stations and secure end-of-trip facilities.

## PEDESTRIAN AND BICYCLIST TYPOLOGIES

People have varying abilities and tendencies to walk or bike and different sensitivities to the presence and quality of transportation infrastructure based on age, gender, physical mobility, and other factors. A person's income level, race, and availability of parking can help explain their tendency to walk or bike.

**Figure 18. Mode Split for BART Station Access in Dublin**




*Source: BART Station Profile Survey (2015)*

1 https://www.kittelson.com/ideas/will-covid-19-permanently-alter-teleworking-and-commuting-patterns-heres-what-1000-commuters-told-us/)

Pedestrian and bicyclist typologies were developed to understand the ability and propensity of people living within Dublin to walk or bike. These typologies are used to estimate the population of each walker and bicyclist type within the city's census block groups and more accurately estimate the potential for bicycle and pedestrian investments because they account for neighborhood populations rather than uniform citywide demographics.

## PEDESTRIAN TYPOLOGY

The walking typology presented in Table 3 was determined based on travel behavior research and experience working on walking infrastructure. As shown in Table 3, the typology assigns walking characteristics based on age (under 14, 14–55, and over 55). For many people with disabilities and people over 55, the absence of curb ramps and presence of multi-lane crossings can be barriers to walking.

## BICYCLIST TYPOLOGY

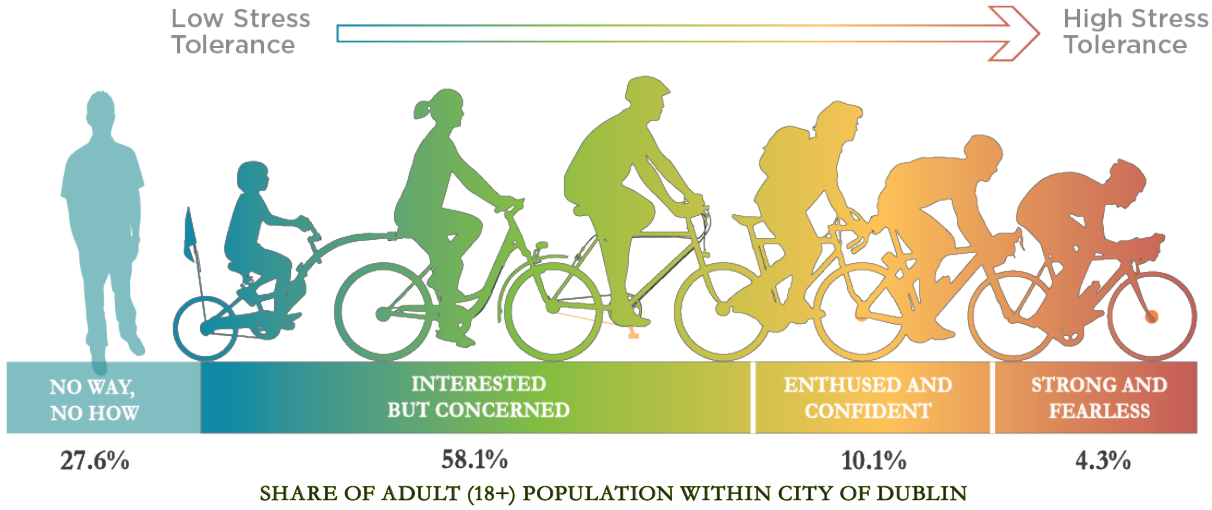
The bicyclist typology, or "four types" categorization, was developed in Portland, Oregon in 2005 as an organizing principle for understanding people's relationship to bicycling for transportation as well as their concerns and needs related to bicycling.[2] Based on this research, bicyclists can be placed into one of four groups based on their relationship to bicycle transportation:

- **No Way, No How, or Non-Bicyclists.** People unwilling or unable to bicycle even if high-quality bicycle infrastructure is in place.
- **Interested but Concerned.** People willing to bicycle if high-quality bicycle infrastructure is in place. People in this type tend to prefer off-street, separated bicycle facilities or quiet residential streets; they may not bike at all if facilities do not meet their needs for perceived safety and comfort.

**Table 3. Pedestrian Typology**

| Age | Typology | Walking Characteristics |
|---|---|---|
| Under 14 | Youth | Limited by multilane crossings |
| 14 to 55 | Teenage and Working Age Adults | Strong and capable, but still limited by sidewalk gaps, unsignalized crossings at major roads, and absence of midblock crossings |
| Over 55 | Aging | The limits experienced by young adults and adults and further limited by the absence of curb ramps or long multilane crossings |

**Figure 19. Bicyclist Typology**




2 Roger Geller, "Four Types of Cyclists," Portland Office of Transportation (2005), https://www.portlandoregon.gov/transportation/44597?a=237507.

Table 4. Bike Group Typology— City of Dublin Population Share of Bicyclist Type by Age

| Bicyclist Type | Share of Age Group | | | | | |
|---|---|---|---|---|---|---|
| | Under 5 | 6–18 | 18–34 | 35–54 | 55+ | Dublin adult (18+) |
| Strong and Fearless | 0% | 0% | 11% | 2% | 0% | 4.1% |
| Enthused and Confident | 0% | 0% | 7% | 12% | 7% | 10.3% |
| Interested but Concerned | 0% | 100% | 61% | 59% | 46% | 58.1% |
| No Way, No How | 100% | 0% | 21% | 27% | 47% | 27.6% |
| **Total** | **100%** | **100%** | **100%** | **100%** | **100%** | |

*Source: Table developed by Kittelson & Associates, Inc. from data presented by Dill and McNeil*

- **Enthused and Confident.** People willing to bicycle if some bicycle-specific infrastructure is in place. People in this type generally prefer separated facilities and are also comfortable riding in bicycle lanes or on paved shoulders, if necessary.
- **Strong and Fearless, or Highly Confident.** People who are willing to bicycle alongside vehicle traffic and on roads without bike lanes.

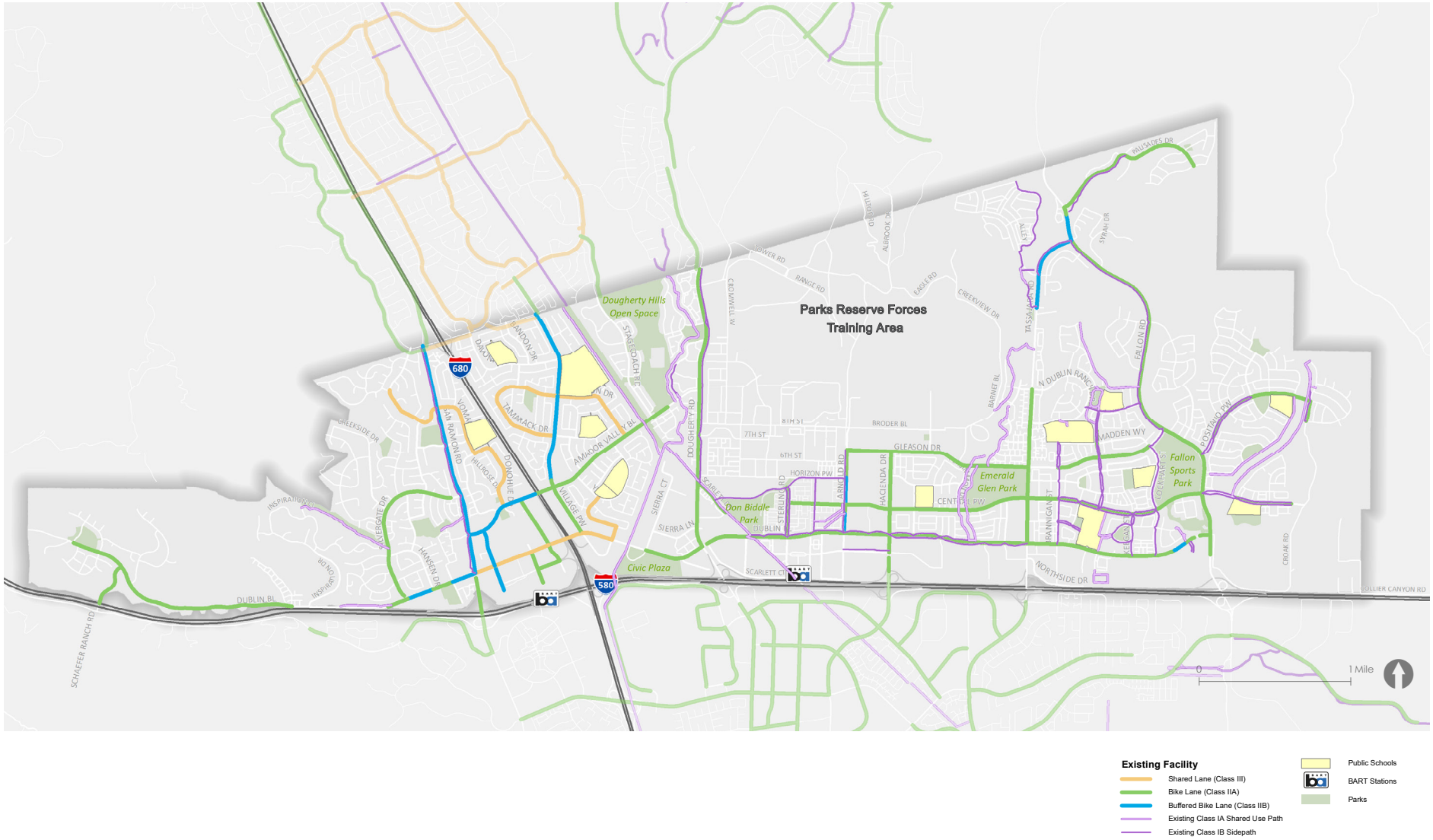
One end of the spectrum includes people who are comfortable riding with vehicle traffic, such as adult regular bike commuters. These highly confident bicyclists are willing to ride on roads with little or no bicycle infrastructure. The other end of the spectrum includes people who are not comfortable riding with or adjacent to traffic. This group often includes children, older adults, and adults who ride infrequently. Typically, these riders prefer off-street bicycle facilities or biking on low-speed, low-volume streets. If bicycle facilities do not meet their comfort preferences, they may not to bike at all. The middle of the spectrum includes bicyclists who prefer separated facilities but are willing to ride with or adjacent to traffic when vehicle volumes and speeds are low enough and separated facilities are not provided.

Table 4 shows the population share for each typology and age group. These population shares were extrapolated to the City of Dublin population to estimate the proportion of adults within the typologies illustrated in Figure 19.

## EXISTING WALKING AND BIKING NETWORKS

This section defines the features, conditions, and types of walking and biking facilities in Dublin (Figure 20). It includes and explains maps of existing on-street bikeways, off-street paths, sidewalks, crossings, and supportive amenities and infrastructure—like walking- and biking-oriented wayfinding, bike parking, drinking fountains, and sidewalk benches.

Figure 20. Existing Bicycle Network Map






DRAFT

# TYPES OF BIKEWAYS

Dublin's existing bikeway system consists of a network of bicycle paths, lanes, and routes. There are four types of bikeways as defined by chapter 1000 of the Caltrans Highway Design Manual (2017). In addition, the Alameda County Transportation Commission (CTC) has adopted a set of sub-classifications for each Caltrans classification. These sub-classifications were designed to correspond with the previously existing system and to incorporate emerging facility typologies.



*Dublin Boulevard east of Tassajara Road. Person riding a bike on a Class II facility separated from right-turning traffic.*

## MULTI USE PATHS (CLASS I)

Multi use paths provide a separate facility designed for the exclusive use of bicycles, pedestrians, and other non-motorized uses with minimal vehicle crossflows. Generally, bicycle paths serve corridors not served by streets or are parallel to roadways where right of way is available. These paths provide bicyclists both recreational and commute routes with minimal conflicts with other road users.

**Class IA Paths**—Multiuse paths along a separate alignment. In Dublin, this bikeway class exists on the Iron Horse Trail and the Martin Canyon Creek Trail.

**Class IB Sidepaths**—Sidepaths that double as sidewalks along the side of a roadway. Examples include segments along the north side of Dublin Boulevard and the west side of San Ramon Road.

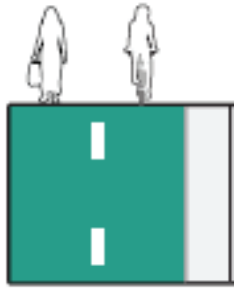


*Diagram of typical Class IB path configuration*



*Alamo Creek Trail, Dublin, CA. Source: City of Dublin*



*Class IB Path on San Ramon Road, Dublin, CA. Source: Kittelson & Associates, Inc*

## BICYCLE LANES (CLASS II)

Bicycle lanes are on-street bikeways that provide a dedicated space for the exclusive or semi-exclusive bicycle use. Through-travel by motor vehicles or pedestrians is prohibited; vehicle parking and pedestrian- and motorist-crossflows are permitted.

**Class IIA**—A conventional one-way striped bicycle lane.

**Class IIB**—Upgraded bicycle lane with a striped buffer or green conflict markings. In Dublin, this bikeway class exists on Dublin Boulevard from Silvergate Drive to San Ramon Road and on Tassajara Road from Rutherford Drive to Fallon Road.

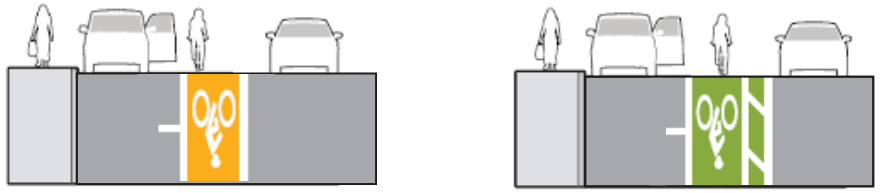


*Diagram of typical Class IIB bike lane configuration*



*Class IIB Facility on Amador Valley Boulevard, Dublin, CA. Source: City of Dublin.*

## BICYCLE ROUTES (CLASS III)

Bicycle routes do not provide a dedicated space for bicycles, but instead, bikes share the lane with motorists and signs or pavement markings indicate the bike route.

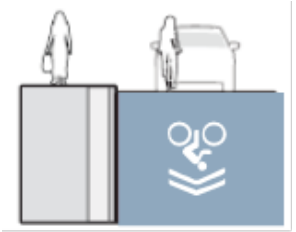


*Diagram of typical Class III bike lane configuration*

**Class IIIA**—Signage-only routes.

**Class IIIB**—Wide curb lane or shoulder that may include signage.

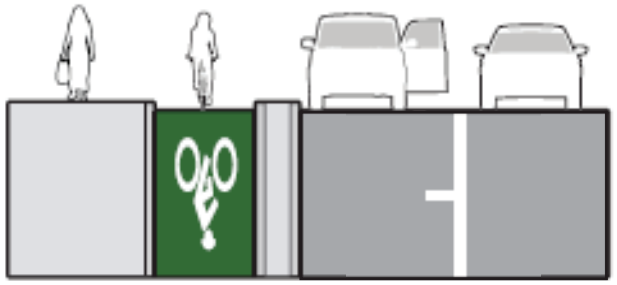
**Class IIIC**—Route with standard shared lane markings ("sharrows") that can be used to alert drivers of the shared roadway environment with bicyclists. This class of bikeway exists on Davona Drive.



*Class III Facility in Portland, OR. Source: Kittelson & Associates, Inc.*

## SEPARATED BICYCLE LANES (CLASS IV)

Separated bicycle lanes are bicycle lanes that provide vertical separation from motorists on roadways. The separation may include grade separation, flexible posts, planters, on-street parking, or other physical barriers. These bikeways provide a greater sense of comfort and security in comparison to standard Class II bike lanes. Class IV facilities are especially relevant for high-speed or high-volume roadways. Separated bike lanes can provide one-way or two-way travel.





*Class IV Facility, San Diego, CA Source: Kittelson and Associates, Inc.*

# SUPPORTING INFRASTRUCTURE

In addition to the on- and off-street facilities, supporting infrastructure is essential to promote walking and biking as viable modes of transportation. Critical elements include end-of-trip facilities, such as bicycle parking, showers, and lockers. Other critical infrastructure elements include wayfinding, drinking fountains, seating, and shade.

## BICYCLE PARKING

Secure short-term and long-term bicycle parking that can accommodate a wide range of bicycles including children's bicycles, electric bicycles, and cargo bicycles, for example, are necessary to support biking. Access to secure bicycle parking is one of the top factors determining whether someone chooses to ride a bike or not.

Bike parking should be added to new developments as well as key destinations like BART

New development provides key opportunities to ensure Dublin adequately provides both short- and long-term bicycle parking.



*Bike Parking at Dublin Library Source: City of Dublin*

Currently, Dublin follows parking requirements n Section 5.106.4 of the California Green Building Code. This code states that short-term parking must be provided for five percent of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack. The bicycle parking must be anchored within 200 feet of the visitors' entrance. Long-term bike parking must be provided for new buildings with tenant spaces with 10 or more tenant-occupants, also at a 5 percent of vehicle parking space rate with a minimum of one bicycle parking facility.

**Short-term bicycle parking** refers to traditional bike racks, which may be located on public or private property. Bike racks serve people who need to park their bikes for relatively short durations of about two hours or less. Because short-term bicycle parking does not provide additional security, locked bicycles and their accessories may be exposed to theft or vandalism. However, short-term bike racks are more numerous and conveniently located near destinations. To deter theft or vandalism, short-term parking should be within eyesight of a building or destination or located in well-traveled pedestrian areas. Dublin has short-term bicycle parking in the Downtown area as well as at many local parks and community centers.

**Long-term bicycle parking** is the most secure form of parking and and is necessary for most workplaces, residences, transit stations, park and ride lots, and other locations where individuals park their bikes for more than a few hours or overnight. Because long-term bike parking requires more space than short-term racks, facilities may be located farther away from the ultimate destination. Long-term parking is also often more expensive due to added security and space requirements. Long-term parking can consist of bike lockers, enclosed bike cages, bike rooms, and bike stations, each of which is discussed in the following bullets. Long term parking should also support charging for e-bikes.

- **Bike lockers** are fully enclosed and generally weather-resistant spaces where a single bicycle can be parked and secured by key or electronic lock. Shared-use electronic lockers operated by BikeLink are provided at the West Dublin/Pleasanton BART Station (68 lockers) and West Dublin BART Station (56 lockers). The BikeLink system allows users to pay by the hour for use of the lockers through a membership card.
- **Enclosed bike cages** are multiple bike racks contained by a fence. The enclosure entrance is secured with a lock or key code, but within the cage, bicycles are exposed and secured to racks with personal locks. Cages can be outdoors (ideally with a roof for weather resistance) or located in building parking garages or utility rooms. Because contents are visible through the cage and bikes inside are accessible, the security of a bike cage depends on good management of access keys or codes. Bike cages are most appropriate for closed environments such as businesses, office buildings, or multi-family developments with access limited to owners, tenants, or employees.
- **Bike rooms** are bicycle racks located within an interior locked room or a locked enclosure. Because they house bikes behind solid walls, bike rooms are more secure than bike cages, where bikes remain visible from the outside. As with bike cages, bike room security depends on access key and code management. Bike rooms are most appropriate where access is limited to owners, tenants, or employees.
- **Bike stations** are full-service bike parking facilities that offer controlled access and other supporting services like attended parking, repairs, and retail space. Bike stations can offer services such as free valet parking, 24-hour



*BikeLink lockers at the West Dublin/Pleasanton BART Station. Source: Kittelson * Associates. Inc.*



*Maintenance station on a trail. Source: Kittelson & Associates, Inc.*



*Wayfinding signage for West Dublin/ Pleasanton BART Station. Source: Kittelson & Associates, Inc.*

access-controlled parking, sales of bike accessories, bike rentals, and classes.

## Other Infrastructure and Amenities

**Skateboard and Scooter Lockers should be provided at key destinations** with high levels of skateboard and scooter activity like schools, transit stations, parks, and trailheads.

**Showers, Lockers, and Changing Rooms** are important end-of-trip amenities that encourage bicycle commuting. Some places of employment in Dublin may provide showers, lockers, and changing rooms. However, the City does not inventory such facilities. The Shannon Community Center, Dublin Civic Center, and the high school and middle schools all provide showers and lockers.

**Maintenance Station**s for bicycles should be provided throughout the city at key destinations with high levels of bicycle activity like trailheads, employment centers, transit stations, parks, and schools. Maintenance stations may include a repair stand with tools, such as screwdrivers, flat wrenches, pressure gauges, tire pumps, and other equipment, to allow people biking the opportunity to make on-the-go repairs.

**Wayfinding** helps a high-quality bicycling and pedestrian network be easily navigable. Bicycle and pedestrian wayfinding helps residents, tourists, and visitors find key destinations. Modern, cohesive, multimodal sign plans and designs distinguish walking and bicycling routes, highlight specific destinations, and facilitate connections to and from public transit stops. Wayfinding can also define connections with popular hiking trails and regional trails. There is a need for a comprehensive wayfinding signage program in Dublin.

**Lighting** improves safety and visibility for pedestrians and bicyclists. Some routes that are convenient during the day are unusable in the dark, limiting their utility and effectiveness.

Illuminating trails and sidewalks reduces the possibility of user collisions with objects or each other and makes deformities or unevenness in the surface more visible which can also prevent falls and crashes. For example, pedestrian-scale lighting improvements on Dublin Boulevard under the I-680 overpass are needed to improve visibility of people walking along the corridor.

**Pedestrian amenities** are a critical part of pedestrian-focused design, which prioritizes safety, comfort, and quality of service. Amenities like planters, benches, drinking fountains, restrooms, and sidewalk trees all enhance a walking environment.

**Shared mobility** allows for flexible transportation options and provides bicycles and scooters to community members who would otherwise lack access to these modes. Dublin does not currently offer shared mobility options.

# KEY WALKING AND BIKING DESTINATIONS

The choice and ability to walk and bike to essential destinations greatly benefits community members through increased activity and improved health. Walking and biking also benefits the broader community by reducing in greenhouse gas emissions and vehicle congestion. People have varying abilities and tendencies to walk or bike based on infrastructure presence and quality. Land-use patterns that determine the distance between origins and destinations as well as the density, diversity, and intensity of uses also shape people's walking and biking habits.

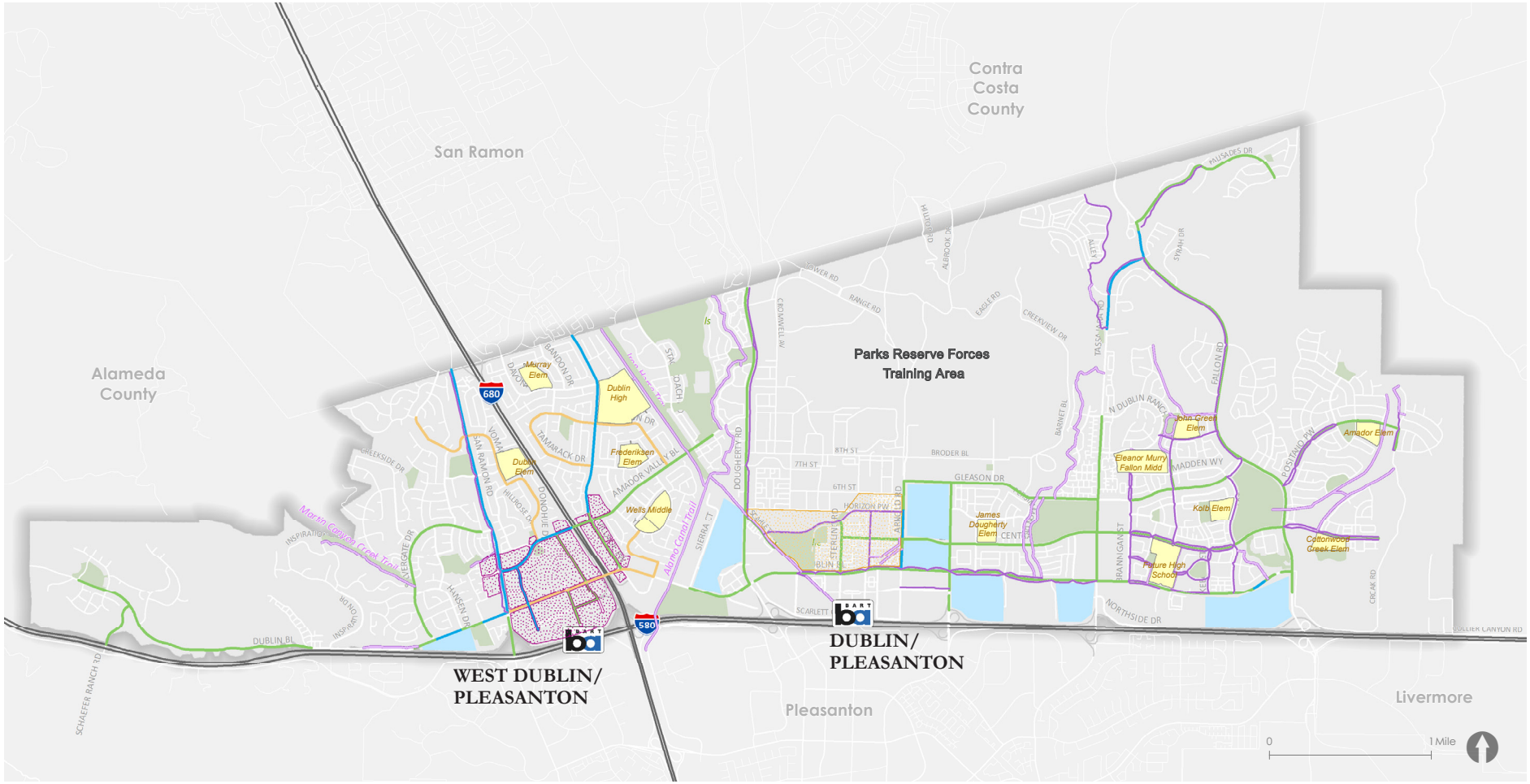
Key walking and biking destinations were mapped. Specific points of interest were selected for consistency with the Plan's goals to increase walking and biking mode share to school, transit, trailheads and parks, and work. These activity centers are shown in Figure 21 and include:

- **Schools:** All public K–12 schools within Dublin Unified School District
- **BART:** West Dublin/ Pleasanton station and Dublin/Pleasanton station
- **Job Centers:** Seven job centers that include Dublin's largest employers and concentrations of employment
- **Parks:** Neighborhood and community parks in Dublin



*Person with an e-scooter waiting to cross at Dougherty Road and Amador Valley Road. Source: Kittelson & Associates. Inc.*

Figure 21. Land Use, Key Destinations, and Existing Facilities Map



# EXISTING PROGRAMS

As shown in Table 5, the City, the school district, the Police Services, Alameda CTC, and nonprofit organizations provide numerous programs that support walking and biking in Dublin. These programs play an important role in promoting active transportation and fostering safe walking and biking in the city. The City of Dublin recognizes the critical role that programs and policies play in complementing physical infrastructure to promote walking and biking and will continue to support and broaden the reach of these existing programs.

**Table 5. Existing Bicycle and Pedestrian Programs**

| Program | Description | Managing Department / Organization Offering Services |
|---|---|---|
| Bicycle and Pedestrian Counts | Bicycle and pedestrian counts are included in the City's turning movement counts. Bike counters collect data on the Iron Horse and Alamo Canal trails. Bicycle and pedestrian count data is also provided in environmental documents and traffic studies. | Traffic and Planning |
| Safe Routes to School (SRTS) | SRTS establishes routes which maximize safety for travel to and from schools as well as educates school administrators, parents, and children about vehicle, bike, and pedestrian safety. | Dublin Unified School District (DUSD) with support from Alameda CTC; several City departments, including Police, Planning, and Traffic |
| Bicycle Rodeo and Safety Program | Dublin Police Services has a Bicycle Safety Program, which is offered to elementary schools in Dublin. The program supports safe bicycle riding and challenges students' riding abilities in a safe and controlled environment. Dublin Police Services promotes bicycling by educating students about riding safely and properly. | Police |
| Adult School Crossing Guards | Crossing guards help children safely cross the street at key locations on the way to school. Crossing guards set an example of how to safely cross the street, and they may help parents feel more comfortable allowing their children to walk or bike to school. | Police and Traffic |

| Program | Description | Managing Department / Organization Offering Services |
|---|---|---|
| National Bike Month Activities | Sponsored by the City, National Bike Month activities encourage people to bike during the month of May. Promoted events include cycling workshops, classes, and giveaways. The City also sponsors Bike to Work (or Wherever) Day, which provides energizer stations and self-guided rides, and Bike to Market Day, which rewards bicyclists with "carrot cash" to use at the Dublin Farmers' Market. | Traffic and Environmental Programs |
| Walk and Roll to School Week | During October, Walk and Roll to School Week encourages the Dublin community to walk, bike, skate, and ride scooters to school. Dublin schools celebrate walking and bicycling with promotional assemblies, walking school buses and bike trains, giveaways, and prizes. Dublin's participation is partially funded by Measure B/BB. | DUSD, Traffic |
| Bicycle and Pedestrian Projects Workshops | The City hosts biannual bicycle and pedestrian workshops to share information about new bicycle and pedestrian projects and solicit feedback on current and future pedestrian and bicycle infrastructure. | Traffic |
| Traffic Safety Committee | The City's Traffic Safety Committee—comprised of representatives from Dublin Police Services' traffic unit, Public Works' transportation staff, and City maintenance staff—meets monthly to discuss public comments on potential traffic safety issues and to recommend appropriate actions. Common inquiries include requests for traffic calming devices to reduce vehicle speeds, stop sign installations, and new signs and pavement markings. | Police, Traffic, Maintenance |

| Program | Description | Managing Department / Organization Offering Services |
|---|---|---|
| Community Rides and Bike Clubs | Community rides help build both community and physical skills among new and continuing riders. They provide a guided pathway for new bicyclists to gain confidence riding and navigating the city on a bike. Regular rides foster community among riders, especially for youth looking for physical and creative outlets outside of school. During school, nonprofit organizations also lead bike clubs at middle and high schools, where staff provide bikes and safety gear and take students on group adventure rides. Community rides can be offered to the entire community or geared to women, queer-identifying, or other less-likely-to-ride demographics that are better served by a safe space that celebrates and empowers rider identity. | Cycles of Change, Bay Area Outreach and Recreation Program, Bike East Bay |
| Bike Education Classes | One or more sessions, bike education classes teach riders bike safety, bike mechanics, theft prevention, and other useful skills. Youth Bike Rodeos, Bike Mechanics Classes, Adult Bike Safety Classes, and Family Biking Workshops are a few examples of the variety of different bicycle classes offered by nonprofit organizations. | Cycles of Change, Bike East Bay |

# BARRIERS TO WALKING AND BIKING

Barriers to a safe and comfortable walking and biking network in Dublin take many forms, including

- High-stress streets with multiple vehicle travel lanes, high vehicle volumes, high vehicle speeds, and lack of separation between vehicles and other modes.
- Conflicts between bicyclists and turning or merging vehicles at intersections and interchanges.
- Linear barriers such as the two major state highway system facilities (Interstate 680 and Interstate 580) that have limited and poorly-designed crossings for people walking and biking.
- Long crossing distances and limited street connectivity (e.g., cul-de-sacs and long block lengths) for people walking.
- Lack of east-west connectivity that limits route options for people walking and biking and forces travel along high-stress arterials like Dublin Boulevard and Amador Valley Boulevard.

> **"This stretch is scary for bicycling when the lane disappears with lots of traffic." — community member**

> **"A person in a wheel chair or a parent with a stroller can't safety navigate the sidewalk." — community member**

- Incomplete or broken sidewalks, inadequate sidewalk widths, missing or outdated curb ramp designs, and a limited number of accessible pedestrian signals.

These conditions discourage walking and biking and can increase stress and discomfort for those who choose to walk and roll.

This discussion of barriers has two key parts: first, a discussion of safety barriers based on bicyclist and pedestrian collision statistics and citywide high-injury networks; and second, a discussion of pedestrian and bicycle connectivity based on the bicycle level of traffic stress (LTS) analysis and pedestrian crossing opportunities analysis.

## VEHICLE SPEED & SAFETY

As vehicle speeds increase, the risk of serious injury or fatality also increase. Increased speeds also reduce the driver's visual field and peripheral vision. Managing and reducing vehicle speeds is imperative to achieving safer streets.

Figure 22. Influence of Vehicle Speed on Driver's Cone of Vision & Pedestrian Survival Rates

**Higher speeds affect a driver's ability to perceive, focus on, and react to things in their line of vision.**



15 mph 20 mph 30 mph 40 mph

**Higher speeds decrease the chance that a pedestrian will survive a crash.**

*Souce: Tefft, 2013*



**75%** of pedestrians will SURVIVE a crash at **32 mph.**

**50%** of pedestrians will SURVIVE a crash at **42 mph.**

**25%** of pedestrians will SURVIVE a crash at **50 mph.**

Based on the Local Road Safety Analysis, which evaluates all collisions on local roads within the City of Dublin between 2016 and 2020:



**Pedestrian collisions account for 28 percent of all fatal and serious injury collisions in the City—that is more than 10 percent higher than the state average.**



**A disproportionate share of fatal and serious injury—including pedestrian collisions—occur in dusk/dawn or dark conditions.**

# COLLISION ANALYSIS

Pedestrian and bicyclist collision data from 2014 to 2019 from local police reports and the Statewide Integrated Traffic Records System capture safety trends citywide. This section describes the location, severity, circumstances, and timing of collisions involving people walking and biking. Findings from this analysis will help determine streets to prioritize to make it safer for people walking and biking.

## COLLISION TRENDS

Available variables in the collision data helped identify citywide trends. Pedestrian and bicycle collisions were analyzed separately based on the following characteristics:

- Lighting conditions
- Location characteristics (specifically intersection versus segment collisions)
- Primary collision factors cited by reporting officers
- Age and perceived gender of people walking and biking involved in collisions

The small size of each dataset—68 bicycle collisions and 81 pedestrian collisions over six years—limits the ability to find statistically valid trends. However, even with these limitations, the analysis revealed several patterns that reflect conditions in Dublin.

## LOCATION

Table 6 and Table 7 present pedestrian and bicycle collisions based on location and severity. Intersection collisions are those reported to have occurred within a 250-foot intersection influence area—all others are considered segment collisions. A majority of both pedestrian and bicycle collisions happened at intersections, where there are more conflicts with motor vehicle traffic than at other locations along roadways.

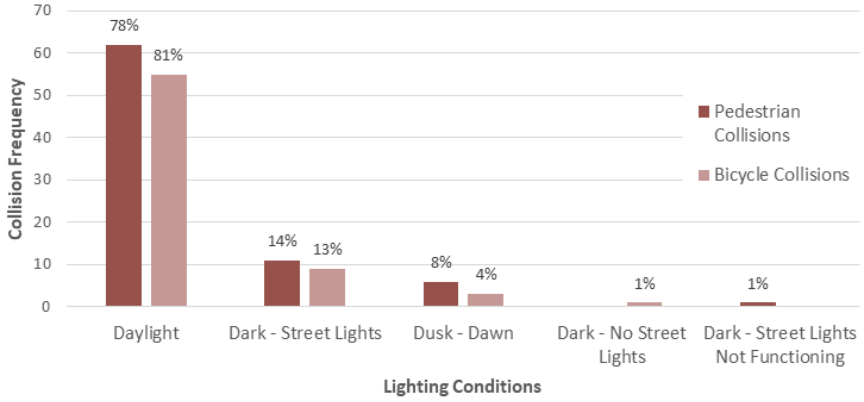
Table 6. Pedestrian Collisions by Location and Severity

| Location | Fatal and Severe Injury Collisions | Other Collisions | Total Reported Collisions | Share of Total Reported |
|---|---|---|---|---|
| Intersection | 11 | 63 | 74 | 91% |
| Segment | 1 | 6 | 7 | 9% |
| **Total Reported** | **12** | **69** | **81** | **100%** |

Table 7. Bicycle Collisions by Location and Severity

| Location | Fatal and Severe Injury Collisions | Other Collisions | Total Reported Collisions | Share of Total Reported |
|---|---|---|---|---|
| Intersection | 2 | 50 | 52 | 76% |
| Segment | 1 | 15 | 16 | 24% |
| **Total Reported** | **3** | **65** | **68** | **100%** |

Figure 23. Pedestrian and Bicycle Collisions by Lighting Conditions




*NOTE: totals may not sum to 100% due to rounding*

*Source: 2014-2019 Statewide Integrated Traffic Record Systems collision database.*

## Lighting

Lighting conditions are an important factor for pedestrian and bicyclist visibility and personal security by enabling people to see each other. Figure 23 presents pedestrian and bicycle collisions by lighting conditions. The majority of bicycle and pedestrian collisions occurred in daylight conditions. All reported fatal and severe-injury bicycle collisions occurred in daylight conditions. When collisions occurred in dark conditions, they happened primarily under streetlights.

## Primary Collision Factors

Primary collision factors (PCFs) are provided in the data and aggregated based on the section of the California Vehicle Code that the reporting officer records. For bicycle collisions, the PCFs were

- Automobile right of way violation (26 percent of collisions), which indicates one of several California Vehicle Violation codes regarding a failure to yield right-of-way to oncoming traffic. This action may come from either the bicyclist or motorist involved.
- Improper turning (16 percent of collisions), which indicates a motorist committed a hazardous violation while turning.
- Other hazardous movement (12 percent of collisions), an aggregated violation category that indicates a hazardous movement on the part of either the bicyclist or motorist involved.

The PCFs cited most frequently for pedestrian collisions were

- Pedestrian right of way violation (27 percent of collisions), which indicates a driver violated a pedestrian's right of way.
- Other improper driving (20 percent of collisions) represents an aggregation of motorist violations.
- Automobile right of way violation (14 percent of collisions), which indicates

one of several California Vehicle Violation codes regarding a failure to yield right of way to oncoming traffic. This action may come from either the pedestrian or motorist involved.

- Pedestrian violation (6 percent of collisions), which indicates a pedestrian violated laws regarding right of way.

## Age of Parties Involved

Figure 24 compares the ages of people walking or biking involved in collisions to Dublin's population. Age data was only available for 76 percent of pedestrians and for 63 percent of bicyclists involved in collisions. This comparison reveals that people aged 15–24 are overrepresented in bicycle and pedestrian collisions. Although they make up just eight percent of the city's population, people in this age group represent 25 percent and 18 percent of pedestrians and bicyclists involved in collisions. Similarly, people aged 45–64 are underrepresented among pedestrian and bicyclist collisions (at 12 percent each), despite making up 25 percent of Dublin's population.

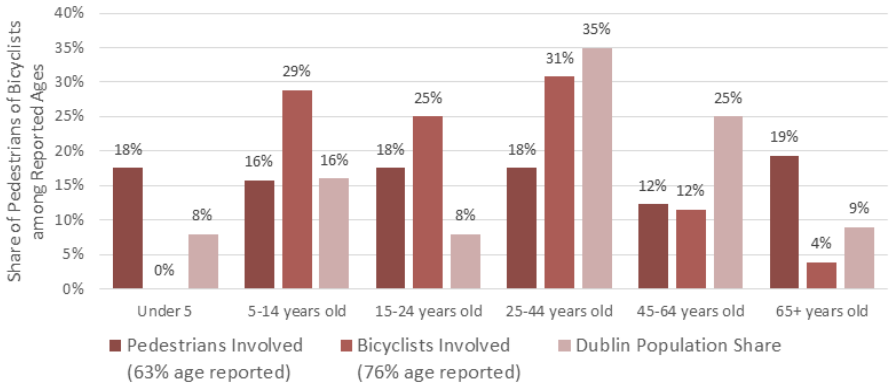
## Gender of Parties Involved

Additionally, gender was recorded by the reporting officer for 78 percent of bicyclists involved in collisions and for 59 percent of pedestrians. Available data reveals that men represented approximately 60 percent of pedestrians involved in collisions and 83 percent of bicyclists involved in collisions.

# HIGH-INJURY NETWORK

An analysis of the citywide roadway network was conducted to identify a set of bicycle and pedestrian high-injury streets, together called a high-injury network (HIN). This HIN constitutes the worst-performing segment locations based on collision severity and frequency of collisions involving people walking and biking.

**Figure 24. Age of Parties Involved in Collisions**

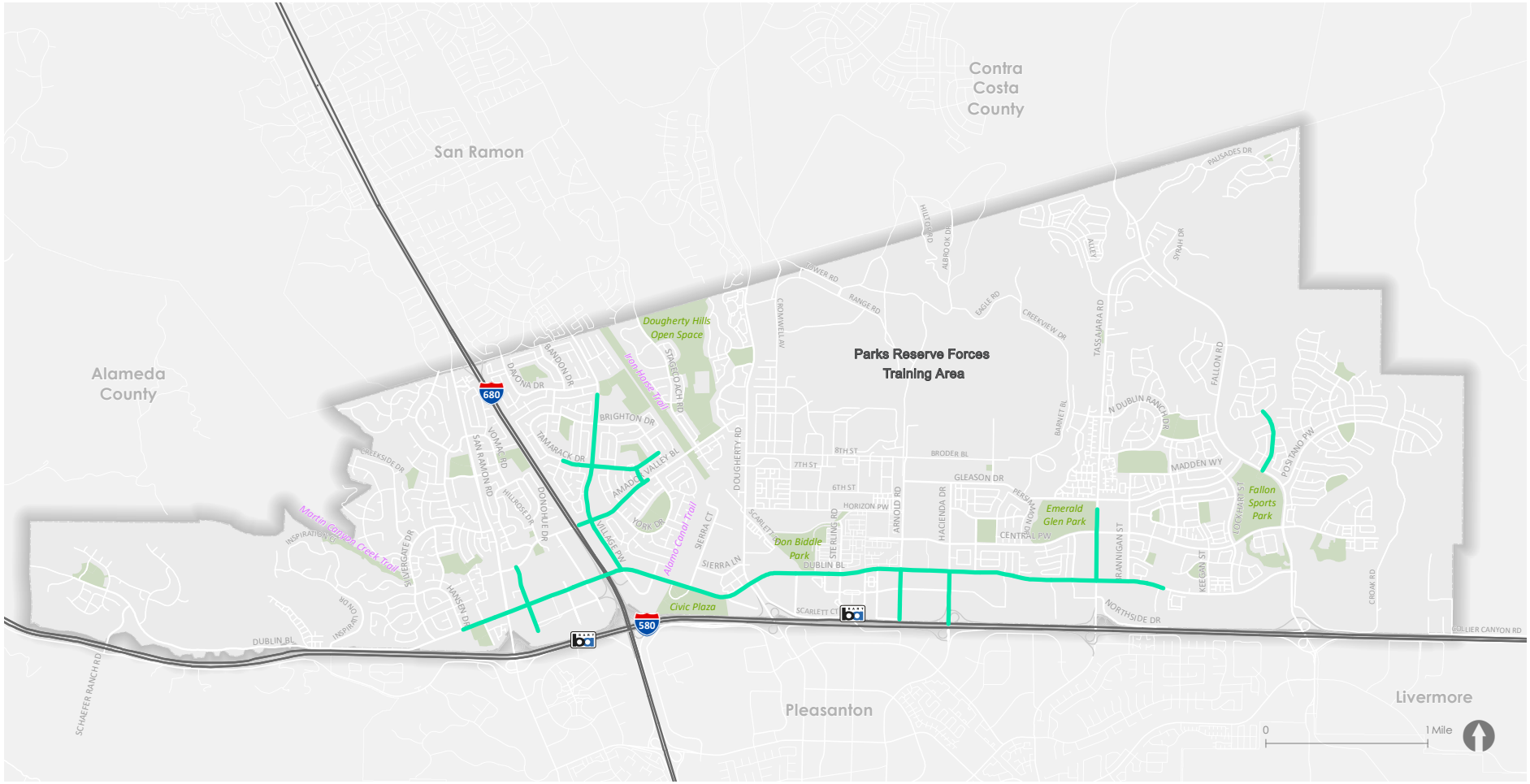



*NOTE: totals may not sum to 100% due to rounding*

*Source: 2014-2019 Statewide Integrated Traffic Record Systems collision database.*

> **"Every time I cross here, I almost get hit by a car trying to enter the freeway." — community member**

Figure 25. Pedestrian High-Injury Network Map



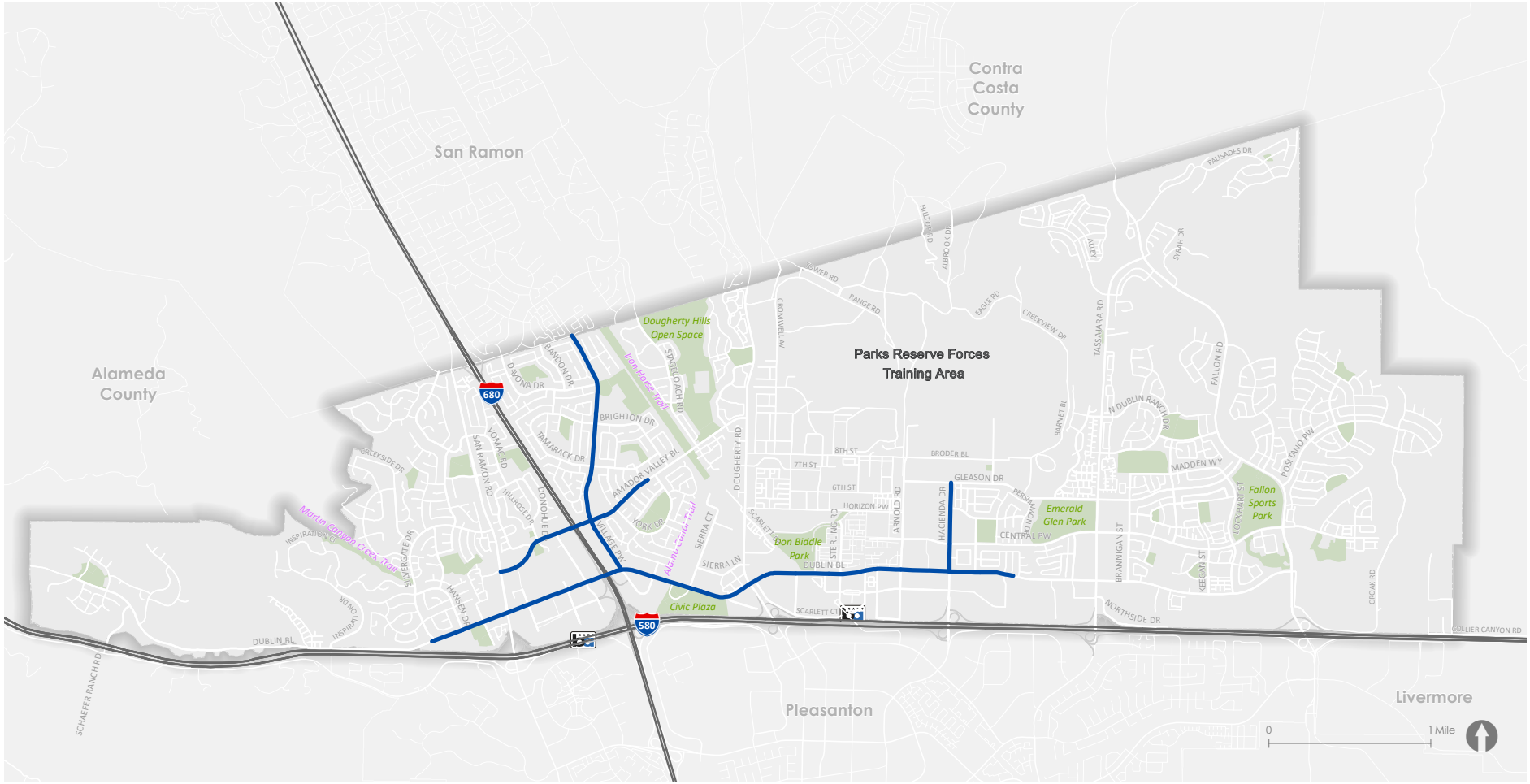

**62 percent of pedestrian collisions occurred on 4 percent of Dublin's roads (8.4 miles)**

**71 percent of the pedestrian high injury streets has four or more vehicle through lanes**



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Figure 26. Bicycle High-Injury Network Map




**62 percent of bicycle collisions occurred on 3.5 percent of Dublin's roads (6.7 miles)**

**88 percent of the bicycle high injury streets has four or more vehicle through lanes**

Bicycle High Injury Network

Table 8. High Injury Streets

| Roadway | Extents |
|---|---|
| **Pedestrian High Injury Streets** | |
| Amador Valley Boulevard | I-680 to Burton St. |
| Arnold Road | I-580 to Dublin Blvd. |
| Bent Tree Drive | Fallon Rd to Sugar Hill Terr. |
| Burton Street | Amador Valley Blvd. to Tamarack Dr. |
| Dublin Boulevard | Hansen Dr. to Grafton St. |
| Hacienda Drive | I-580 to Dublin Blvd. |
| Regional Street | Southern extents to Amador Valley Blvd. |
| Tamarack Drive | Canterbury Ln. to Brighton Dr. |
| Tassajara Road | Dublin Blvd. to Gleason Dr. |
| Village Parkway | Dublin Blvd. to Davona Dr. |
| **Total Mileage: 8.4 miles** | |
| **Bicycle High Injury Streets** | |
| Amador Valley Boulevard | San Ramon Rd. to Penn Dr. |
| Dublin Boulevard | Silvergate Dr. to Myrtle Dr. |
| Village Parkway | Dublin Blvd. to City Limits (N) |
| **Total Mileage: 6.7 miles** | |

**66 percent of bicycle collisions and 66 percent of pedestrian collisions occur on just 10 percent of streets in the City.**

## High Injury Streets

Table 8 provides the extents of each high injury street along with the total mileage (measured as centerline miles).

## HIGH INJURY NETWORK CHARACTERISTICS

- 62 percent of pedestrian collisions occurred on 4 percent (8.4 miles) of Dublin's roads.
- 62 percent of the city's bicycle collisions occurred on 3.5 percent (6.7 miles) of Dublin's roads.

Dublin's pedestrian and bicycle HINs overlap for many of their segments. About 10 miles or just over 5 percent of Dublin's roadways appear in either the bicycle HIN, pedestrian HIN, or both. This means that 66 percent of Dublin's bicycle collisions and 66 percent of its pedestrian collisions occur on just 10 percent of streets in the city.

## Key Characteristics of the Pedestrian HIN

- Approximately 40 percent of the pedestrian HIN has a speed limit of 35 miles per hour. Additionally, 32 percent of the HIN mileage consists of roads with speed limits of 40 or 45 miles per hour. The remainder of the HIN has speed limits of 25 or 30 miles per hour.
- Approximately 55 percent of the pedestrian HIN consists of roads classified as arterial roads; the remaining roads are collector or residential streets.
- Approximately 47 percent of the HIN has five or six vehicular through lanes. Another 24 percent of the network has four vehicular through lanes. The remainder of the HIN consists of roads with two or three lanes.

### Key Characteristics of the Bicycle HIN

- Approximately 78 percent of the bicycle HIN mileage consists of roads with speed limits of 35 or 45 miles per hour. The remainder of the HIN has a speed limit of 30 miles per hour.
- The bicycle HIN is nearly evenly divided between arterial and collector roadways, with 54 and 46 percent, respectively.
- Approximately 88 percent of the HIN has four or more vehicular through lanes.

# BICYCLE LEVEL OF TRAFFIC STRESS

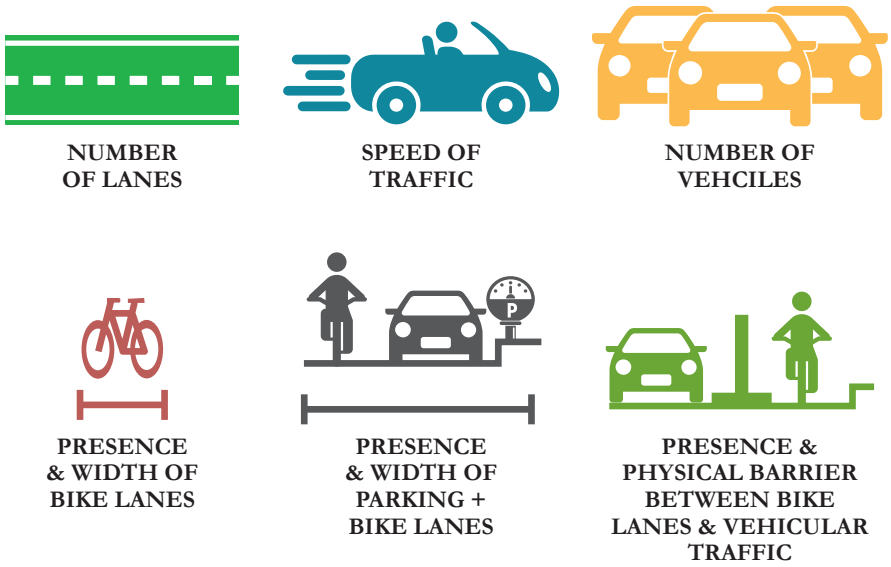
## LTS METHODOLOGY

People on bikes are vulnerable street users. The presence of any one of several factors can make people feel unsafe or uncomfortable. Bicycle level of traffic stress (LTS) measures the stress imposed on bicyclists by a road segment or crossing.[3] The LTS methodology was used to classify Dublin's intersections and on-street roadway and path segments as one of four levels of traffic stress. Classifications range from LTS 1 to LTS 4, with 1 being the most comfortable/least stressful and 4 being least comfortable/most stressful.

## ON-STREET ROADWAY SEGMENT LTS METHODOLOGY

The on-street roadway segment LTS methodology provides criteria for three bicycle facility types: bike lanes alongside a parking lane, bike lanes not alongside a parking lane, and mixed traffic (i.e., no bike lanes present). On-street roadway segment LTS analysis considers several factors that affect bicyclist comfort, including the number of vehicle travel lanes, vehicle volume, vehicle speed, presence and width of bike lanes, presence and width of parking lanes, and presence and type of separation between the bike lane and vehicle travel lanes (see Figure 27).

Figure 27. Roadway Characteristics Used to Calculate Bicycle LTS




### Path LTS Methodology

The path LTS methodology was created to account for the various design factors that affect quality of service and bicyclists' stress on the Class IA paths and Class IB sidepaths in Dublin. The analysis considers segment characteristics, including path width, shoulder width and separation, and wayfinding. The analysis also considers intersection/crossing elements, such as traffic control, crossing distance, geometric elements, pavement markings, and signage.

3 This report uses an on-street LTS methodology developed by the Mineta Transportation Institute (MTI) and documented in the Low-Stress Bicycling and Network Connectivity report published in 2012. This methodology was further refined by Dr. Peter Furth of Northeastern University in 2017. See Mekuria, Mazza C., "Low-Stress Bicycling and Network Connectivity" (2012), All Mineta Transportation Institute Publications., Book 4. http://scholarworks.sjsu.edu/mti_all/4 and http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/, specifically "Version 2.0," published in June 2017.

### Crossing LTS Methodology

A crossing LTS analysis was conducted for street and path intersections located along high-stress facilities (segments that scored LTS 3 or LTS 4) since it is likely that the characteristics of a high-stress segment can affect the bicyclist experience when crossing from a low-stress street. The crossing methodology analyzes intersections and crossings for the following situations:

- Intersection approaches for pocket bike lanes (bike lanes that are to the left of a dedicated right-turn vehicle lane)
- Intersection approaches for mixed traffic in the presence of right-turn lanes
- Intersection crossings for unsignalized crossings without a median refuge
- Intersection crossings for unsignalized crossings with a median refuge

These situations do not describe all crossing circumstances. For example, in Dublin, many Class I facilities cross at signalized intersections. These situations are covered in the path LTS methodology.

## LTS RESULTS

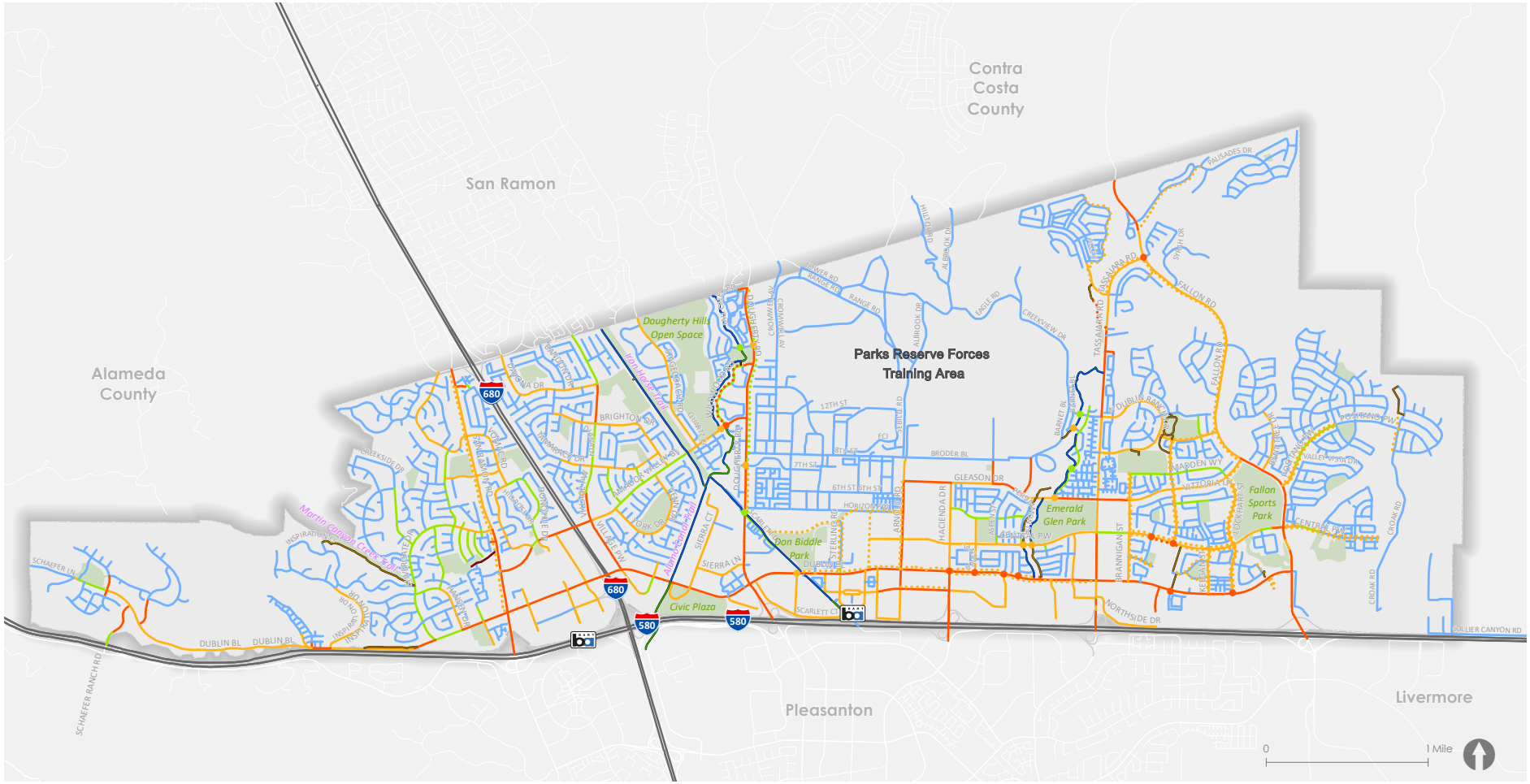
The LTS analysis was conducted using a spatial database with inputs obtained through a combination of field review, Google Earth aerial review, and City input. Assumptions were applied to fill data gaps where necessary.

The on-street and path LTS results, presented together on Figure 28, illustrate citywide bicycle level of traffic stress and network connectivity. To simplify the level of detail shown, the directionality of the on-street LTS has been suppressed. Each on-street segment is displaying its highest (i.e., worst) LTS value. Refer to appendix C for the full set of LTS maps, including directional LTS.

- **On-Street Level of Traffic Stress**. Low-stress streets in Dublin are typically local residential roads without dedicated bicycle facilities where vehicle speeds and volumes are low. Higher stress streets are often arterial roads like Dublin Boulevard, which are less comfortable for bicyclists, due to the relatively higher vehicular speeds, higher traffic volumes, and the number of vehicle travel lanes. These higher stress streets present barriers to low-stress travel where they intersect with low-stress facilities and create islands isolated by high-stress segments and crossings.
- **Path LTS**. Class IA multiuse paths most frequently score an LTS 2 given their width, shoulder, and wayfinding presence. Class IB side paths frequently score an LTS 3 with no wayfinding present along their segments. Path crossings vary, but they rarely exceed LTS 3 except at intersection crossings with high speeds, high volumes, and no crossing markings or signage. Although path LTS values were assessed for every path crossing location, only crossings with scores lower than their connecting path segments are mapped in the results. In other words, the mapped crossings are those which degrade the neighboring segment path LTS.
- **Low Stress Islands.** Figure 29 presents Dublin's network of low-stress facilities and highlights where gaps and islands exist. Fallon Road, Tassajara Road, San Ramon Road, and Dublin Boulevard are prime examples of low-stress gaps in the on-street network.

In Dublin, most streets are residential streets. Nearly all of those streets (98 percent) are low stress because of their low speeds and volumes. With generally higher speeds and volumes,

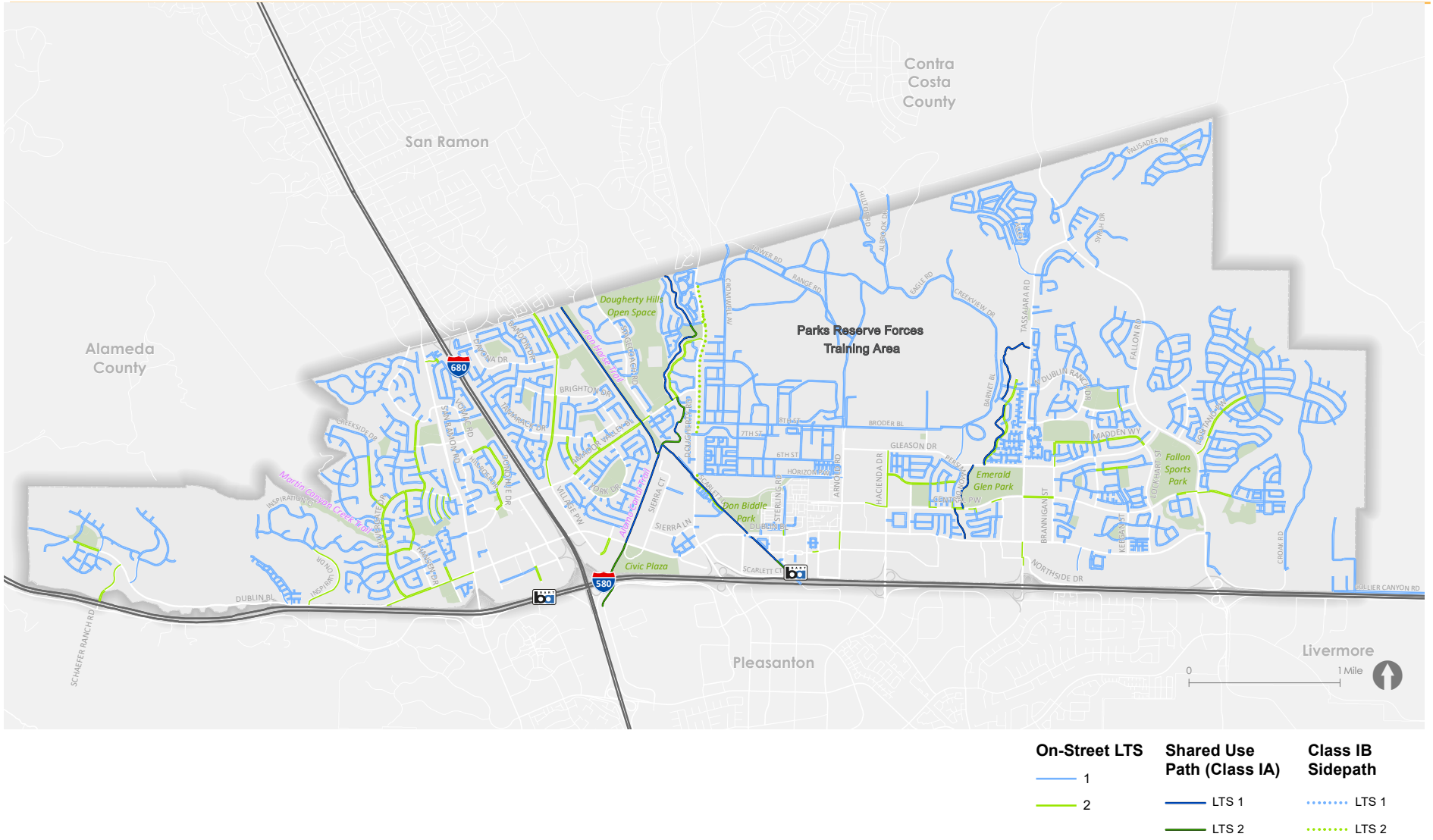
Figure 28. On Street and Path LTS Combined Map




**Path LTS Scores**

| On-Street LTS | Shared Use Path (Class IA) | Sidepaths (Class IB) | Path Crossings |
|---|---|---|---|
| LTS 1 | LTS 1 | LTS 1 | LTS 1 |
| LTS 2 | LTS 2 | LTS 2 | LTS 2 |
| LTS 3 | LTS 3 | LTS 3 | LTS 3 |
| LTS 4 | LTS 4 | LTS 4 | LTS 4 |

Figure 29. Low Stress Islands Map






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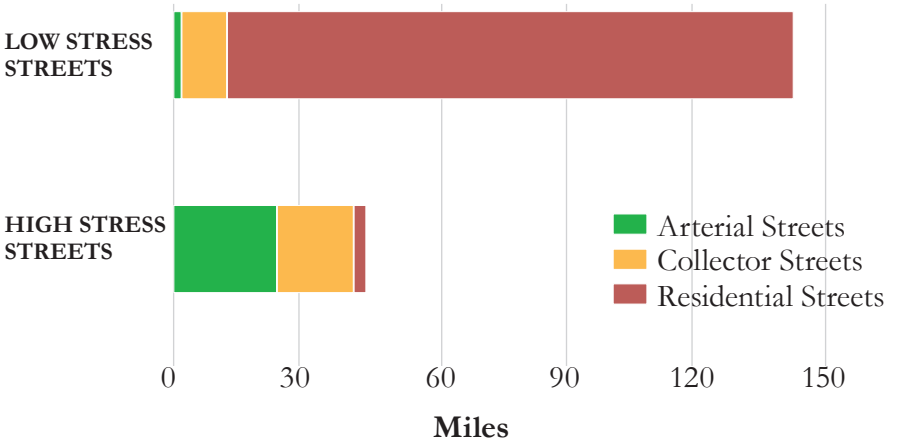
collector and arterial roadways are higher stress for bicyclists unless they have appropriate facilities. Only 37 percent of collectors and 7 percent of arterials in Dublin are low stress (see Figure 30). Many businesses and services are located on or near collectors, and these desintations can only be accessed with some travel along or across the collectors or arterials.

The goal of planning and designing a low-stress bicycle facility network is to enable people of all ages and abilities to feel safe and comfortable riding bicycles throughout the city. These LTS findings are useful for determining and locating appropriate low-stress bicycle facilities in the city. Dublin's extensive network of low-speed and low-volume local neighborhood streets already create a backbone for a low-stress biking network; however, these streets are isolated pockets throughout the city and remain separated by high-stress arterial and collector streets. By enhancing low-stress streets and adding separated bicycle facilities on targeted segments of higher-speed and higher-volume collectors and arterials, Dublin can support a more connected, low-stress bicycle network that better serves key destinations throughout the city.

## PEDESTRIAN CONNECTIVITY

Sidewalk gaps and lack of safe crossing opportunities can create barriers to walking by requiring people to go out of their way to avoid the gap or by forcing people to walk in the street and increase their exposure to vehicle traffic. The current barriers to walking are mapped in Figure 31.

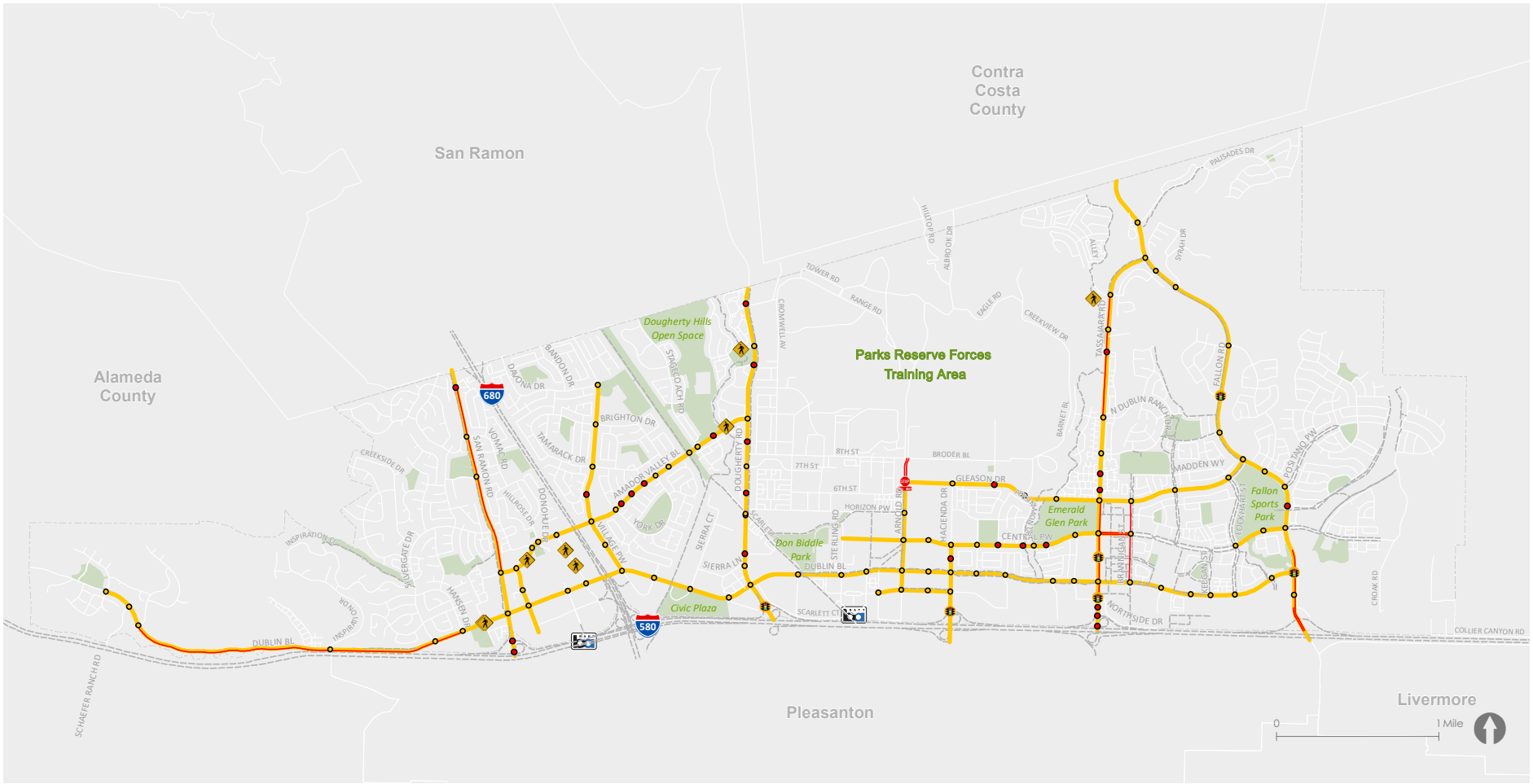
**Figure 30. Miles of Bikeway Stress by Functional Classification**




**Miles does not include paths.*

> "You can't use the sidewalk without tripping on a jagged piece of concrete."
> — community member

Figure 31. Pedestrian Crossing Barriers Map






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# WALKING AND BIKING ACCESS

The ability of people to walk or bike to key walking and biking destinations was analyzed to estimate existing access to key destinations. This analysis was used to identify barriers in the existing network and highlight locations where investments would have the greatest potential to close gaps in the network and increase access and mode share.

The share of the Dublin population that could be expected to walk or bike to each activity center was estimated based on pedestrian and bicyclist typology, distance to the destination, and the quality of available infrastructure. These estimates of walk and bike access were determined by four inputs:

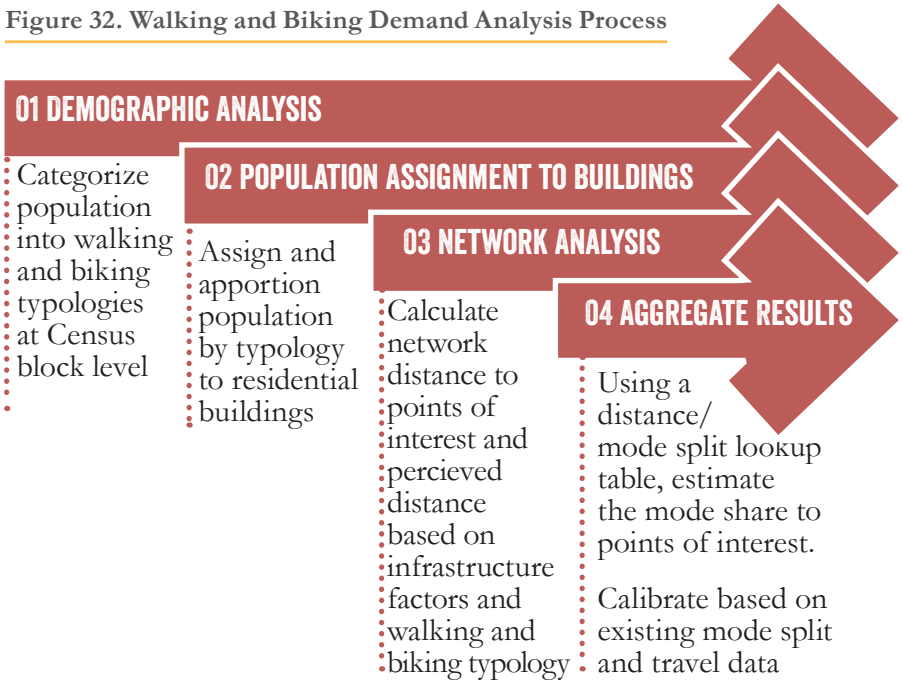
- **Demographic data:** Dublin residents were grouped into walking and biking typology groups based on age. Groups exhibit different propensities to walk or bike and respond differently to supportive infrastructure.
- **Network distance to destination:** The analysis assumed that people used the shortest available route to get to the destinations
- **Barriers and impediments:** For walking, uncontrolled crossings of major roads were identified as blocking or impeding an available walking route. For biking, a high LTS score (3 or 4) blocks or impedes available routes. Barriers block access and require a different route; impediments increase the perceived travel distance, which decreases the likelihood of walking or biking. Populations experience barriers and impediments differently. For example, uncontrolled crossings of major roads can create inaccessible routes for young children and older adults, but are merely inconvenient for teenagers and adults who are more likely to be able to cross. Pedestrian and bicyclist typologies were used to capture such differences in experiences.
- **Mode share data:** Kittelson used data from the National Household Travel Survey (NHTS), BART station profile surveys, the American Community Survey (ACS), and Safe Routes to School (SRTS) mode share surveys to estimate the percentage of people walking and biking and the relationship between mode share and destination distance. The percentage of the population estimated to walk or bike varies based on the perceived distance to the destination. For example, more people walk for a half-mile trip than a one-mile trip.

The analysis was conducted using a four-step process illustrated in Figure 32.

# WALKING AND BIKING DEMAND ANALYSIS PROCESS

The methodology analyzes existing walking and biking access to key destinations using historical travel pattern and count data, demographic data, and infrastructure data. This analysis did not consider other factors that influence mode choice decisions like access or ability to ride a bicycle, income and wealth, disability, and trip chaining characteristics. This analysis indicates the magnitude of existing and potential latent demand for walking and biking based on a set of informed assumptions about the known relationship between infrastructure and mode choice. Existing demand is summarized in this section, and the detailed methodology and outcomes are presented in appendix D.

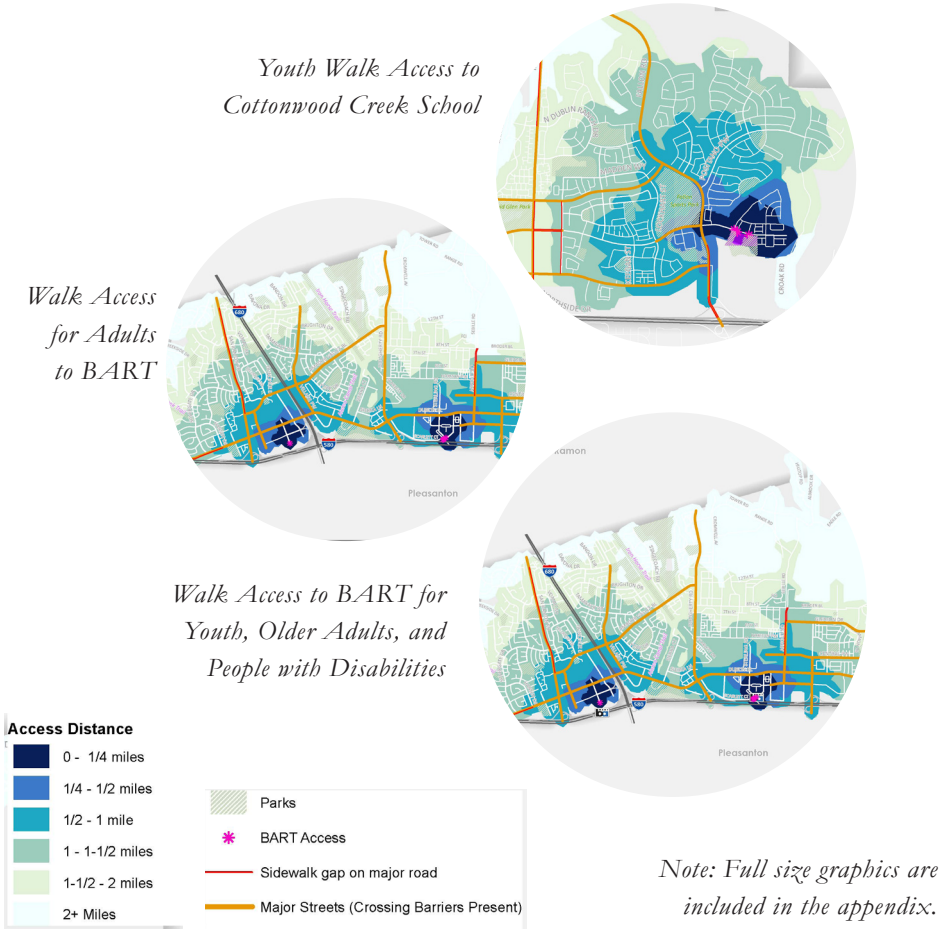
Figure 32. Walking and Biking Demand Analysis Process




## WALK ACCESS

- **Schools**: Cottonwood Creek School, Dougherty Elementary, and Kolb Elementary exhibit the highest estimated walk shares with around 36 percent of students living within walking distance. Other elementary schools similarly exhibit high estimated walk shares, due in part to the localized nature of their student population compared to middle and high schools.
- **Transit**: Approximately 11 percent of Dublin residents are within a 15-minute walk of either the Dublin/Pleasanton or West Dublin BART stations. Over 40 percent of Dublin residents live more than two miles from either BART station.
- **Job Centers**: The walk share estimates range from 4 to 9 percent for each job center. The limited walkability of these sites is largely the result of the distance between the employment and residential uses.
- **Parks and Open Space:** Access for each resident was determined by the nearest City park. The analysis measured perceived distance to any park for each resident rather than to a specific park. Almost 25 percent of Dublin residents live within one-eighth of a mile from a park, and 62 percent of residents live within a one-mile perceived walking distance of a park.

Figure 33. Walk Access




*Note: Full size graphics are included in the appendix.*



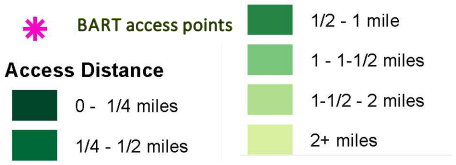
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## BIKE ACCESS

- **Schools:** Access points to Dublin High, Frederiksen Elementary, Murray Elementary, and Wells Middle School are provided on high-stress streets (streets with LTS scores of 3 or 4). High-stress streets create an access barrier and reduce the propensity of students to bike to school. Amador Elementary and Kolb Elementary exhibit the highest estimated bike share with 14 percent of students having low-stress bicycle access.
- **Transit**: Based on the bicyclist typology and available infrastructure, approximately 12 percent of Dublin residents have a bike route matching their stress tolerance and can access one of the two BART stations within an approximately 15-minute ride at a 10-mile per hour pace. Less than one percent of interested and concerned bicyclists have a low-stress bicycle route to BART.
- **Job Centers:** The share of population with an available and acceptable bicycle route varies from 18 percent to 37 percent; the resulting bike mode share estimates range between 1 and 3 percent for each job center. Limitations to bicycle access at these sites is primarily the result of being located on major arterials, which are typically high-stress streets.
- **Parks and Open Space:** Access for each resident was determined by the nearest City park. The analysis measured perceived distance to any park for each resident rather than to a specific park. In Dublin, 42 percent of Dublin residents have an acceptable bicycle route to a park. Nearly 40 percent have no available low-stress route, and the remaining residents would not choose to bike if a low-stress route were available.

**Figure 34. Bike Access to BART**

*Bike access to BART for (left to right) "interested but concerned", "enthused and confident", and "strong and fearless" riders. Illustrates the barriers to access for the "interested and concerned" group, Dublin's largest population of bicyclists. Note: Full size graphics are included in the appendix.*






*Bike access to BART for "interested but concerned"*




*Bike access to BART for "enthused and confident"*




*Bike access to BART for "strong and fearless"*




# 4

# 4. RECOMMENDED BICYCLE & PEDESTRIAN NETWORKS

This chapter presents the recommended citywide bicycle and pedestrian networks.

These networks represent the City's vision for walking and biking infrastructure in Dublin, with new and improved facilities to create safe and comfortable connections to key destinations for users of all ages and abilities. Public feedback and findings from the existing conditions assessment, high-injury network, bicycle level of traffic stress, pedestrian connectivity, and demand analysis contributed to developing the recommended network shown in Figure 35.

## NETWORK DEVELOPMENT

The network was developed in three phases:

- Phase 1: Network Framework
- Phase 2: Network Evaluation
- Phase 3: Network Refinement

The following sections describe the process and outputs of each phase.

### PHASE 1: NETWORK FRAMEWORK

The active transportation network framework includes a variety of sources of data and information including community feedback, related plans and projects, existing conditions and needs analysis, and evaluation of destinations and barriers documented in the preceding chapters.

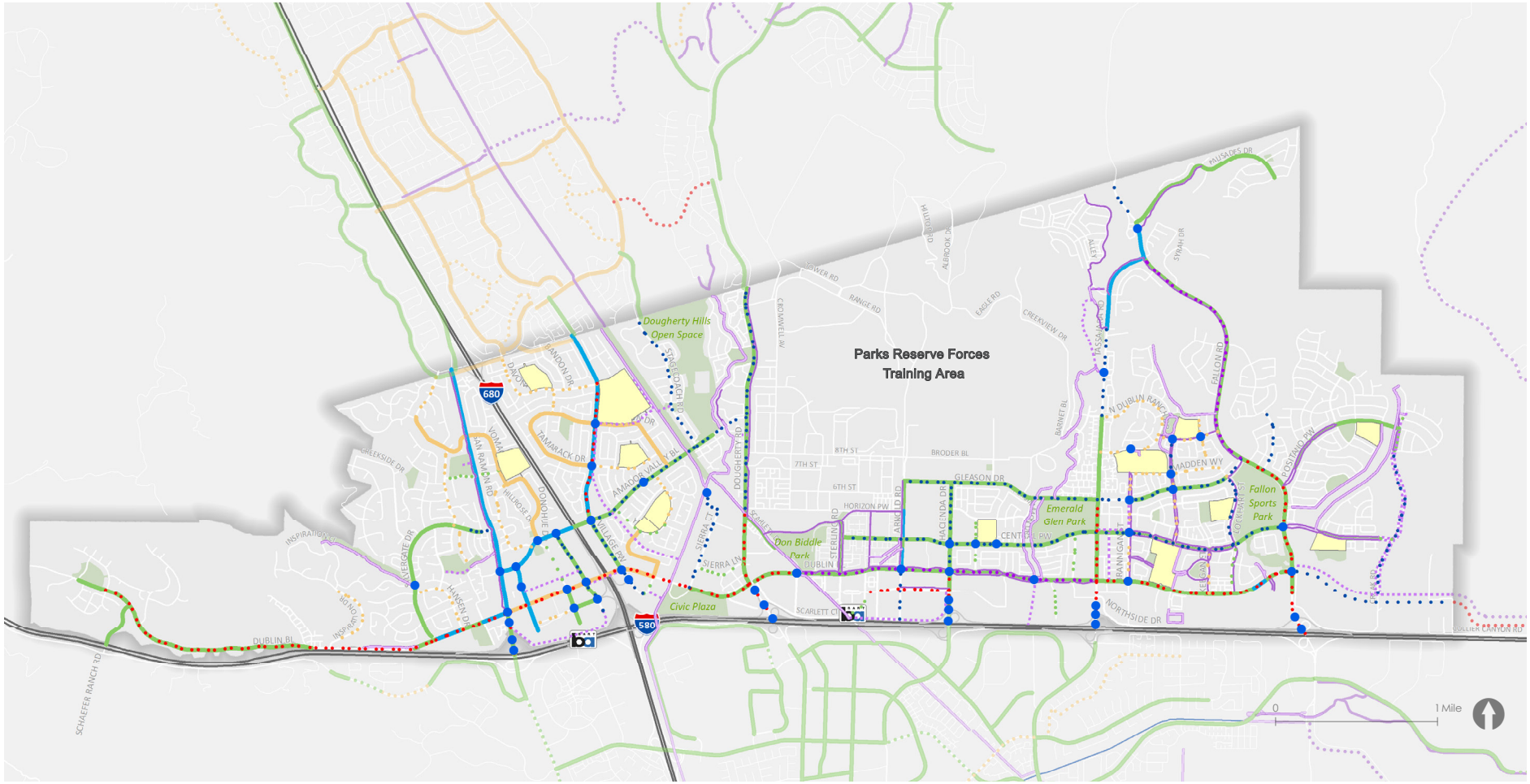
### PHASE 2: NETWORK EVALUATION

The Plan's vision includes creating a safe and comfortable walking and biking network that can be enjoyed by all. Ultimately, the goal of the low-stress network is to enable a wider cross section of the city's population to feel comfortable and safe while making trips by bike and on foot. With the vision of an all ages and abilities active transportation system in mind, criteria from the Federal Highway Administration's Bikeway Selection Guide were used to select initial low-stress facility recommendations for all streets in Dublin. These initial recommendations will help the largest segment of the population to feel comfortable while walking and biking (see Figure 35). Speed and volume roadway operational characteristics were used to determine the appropriate low-stress bicycle facility type.

The identified facility types should be considered a minimum. In cases where more space is available, the City will increase the level of separation between people driving and people biking.

> **"Bike lanes and separate pedestrian path are great" — community member**

Figure 35. Recommended Projects and Existing Facilities




*Locations with identified proposed segment projects may also include pedestrian improvements such as consistent sidewalks, buffers with street trees and/or green stormwater infrastructure, high-visibility crosswalks, accessible curb ramps, curb extensions, reduced corner radii, and signal improvements.*

*Refer to Table 6 for detailed project descriptions.*

**Proposed Point Project**
- Spot Improvement

**Proposed Segment Project**
- Shared Lane (Class III)
- Bike Lane (Class IIA)
- Buffered Bike Lane (Class IIB)
- Complete Streets Study: Separated Facility (Class I or Class IV)
- Complete Streets Study: Consider Improvements to Existing Sidepaths
- Class I Path Project

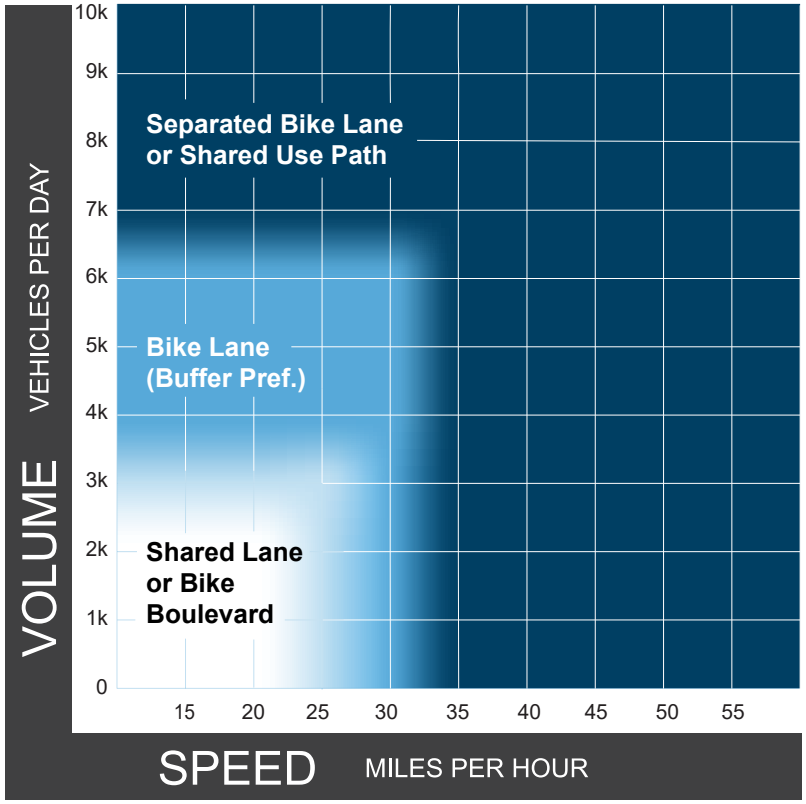
**Existing Facility**
- Shared Lane (Class III)
- Bike Lane (Class IIA)
- Buffered Bike Lane (Class IIB)
- Existing Class IA Shared Use Path
- Existing Class IB Sidepath

- Schools
- BART Stations
- Parks



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Figure 36. Preferred Bikeway Type




**Notes**

1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.

2 Advisory bike lanes may be an option where traffic volume is <3K ADT.

3 See page 32 for a discussion of alternatives if the preferred bikeway type is not feasible.

*Source: US Department of Transportation Federal Highway Administration, Bikeway Selection Guide, FHWA-SA-19-077, February 2019, https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf.*

> **"Would love to see separated bike lanes with street trees and widened sidewalks."**
> **— community member**

## PHASE 3: NETWORK REFINEMENT

Once the low-stress facility was determined, a high-level feasibility assessment of each corridor was conducted to evaluate the potential implications of installing the low-stress facility. For example, assessments considered whether vehicle parking or vehicle travel lanes would need to be removed to install a low-stress facility. For locations where implementation of the all ages and abilities low-stress facility would be more challenging, potential parallel routes were sought to provide similar quality of access as the constrained corridor. Constrained or challenging corridors were identified and recommended for further evaluation as part of a complete streets study. The resulting project list was refined to address feedback from City staff, TAC, BPAC, and community members.

# NETWORK RECOMMENDATIONS

## COMPLETE STREET APPROACH

A Complete Street approach was taken during the development of infrastructure recommendations. Bicycle-, and pedestrian-supportive investments are included in each corridor and crossing project and transit-supportive elements will be further considered along transit corridors as part of design development. The following list illustrates the range of treatments that may be applied to corridor and crossing projects:

- Advance yield markings
- Curb extensions
- Median refuges or crossing islands
- Centerline hardening[4]
- Intersection daylighting[5]
- Narrow vehicle travel lanes
- Traffic control modifications (e.g., stop sign, signal)
- Signal timing and phasing modifications (e.g., restrict right turn on red)
- Sidewalk widening
- Added or upgraded bike facility

The project recommendations are presented as a package, with concurrent improvements to support all three active and sustainable travel modes.

## CORRIDOR PROJECTS

Corridor projects were identified on high-stress roadways that represented barriers to walking and biking.

Recommended corridor projects are summarized in Table 9 and presented by location in Table 10.

**Table 9. Project Type by Length**

| Project Type | Miles |
|---|---|
| **Shared Lane (Class III)** | **12.4** |
| **Bike Lane (Class IIA)** | **3.1** |
| **Buffered Bike Lane (Class IIB)** | **17.0** |
| **Complete Streets Study: Separated Facility (Class I or Class IV)** | **10.4** |
| **Complete Streets Study: Consider Improvements to Existing Sidepaths (Class IB)** | **4.9** |
| **Path (Class IA)** | **7.9** |
| **Speed Reduction Evaluation** | **1.3** |
| **Total** | **56.8*** |

** Corridor projects are not double counted in this total if they represent multiple project types, like speed reduction and buffered bike lanes.*

4 Centerline Hardening. A left-turn traffic-calming treatment that features a vertical element, such as a bollard, rubber curb, or concrete curb installed along the centerline at intersection departures to force drivers to approach the turn at a steeper angle and slower speed.

5 Intersection Daylighting. A strategy to increase visibility at intersections by prohibiting parking (e.g., installing red painted curb) at least 20 feet in advance of a crossing.

Table 10. Recommend Projects by Location

| Project ID | Project Location | From | To | Project Description |
|---|---|---|---|---|
| **SEGMENT PROJECTS** | | | | |
| S-1 | Various locations for Class III facilities/neighborhood bikeways: Tamarack Drive, Davona Drive, St. Patrick Way, Lucania Street, Brighton Drive, Grafton Street, Antone Way, South Bridgepointe Lane, and Brannigan Street | | | Study opportunities and create designs for traffic calming, striping, and signs to create Class III bikeways |
| S-2 | Gleason Drive | Arnold Road | Brannigan Street | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) |
| S-3 | Hacienda Drive | Southern City Limits | Gleason Drive | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) |
| S-4 | Dublin Boulevard | Scarlett Drive | Tassajara Road | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) |
| S-5 | Arnold Road | Dublin Boulevard | Altamirano Ave | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future and evaluate opportunities to lower speed limit; if speeds are not lowered, as a future phase provide a separated facility (Class I or Class IV) |
| S-6 | Grafton Street | Kohnen Way | Antone Way | Convert to a Class IIB bikeway through restriping |
| S-7 | Tassajara Road, Dougherty Road, and Hacienda Drive | Southern City Limits | Dublin Boulveard | Convert to a Class IIB bikeway by restriping travel lanes on Tassajara, Dougherty, and Hacienda at the I-580 overcrossings |
| S-8 | Tassajara Road | North Dublin Ranch Drive | Rutherford Drive | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) |
| S-9 | Village Parkway | Amador Valley Boulevard | Northern City Limits | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-10 | Various locations for Class III facilities/neighborhood bikeways: Tamarack Drive, Davona Drive, St. Patrick Way, Lucania Street, Brighton Drive, Antone Way, South Bridgepointe Lane, and Brannigan Street | | | Implement the traffic calming, striping, and signs plans and designs created in project S-1 to create Class III bikeways |
| S-11 | Village Parkway | Dublin Boulevard | Amador Valley Boulevard | Restripe to add buffer to the Class II facilities and evaluate opportunities to lower speed limit or provide a Class IV or Class I facility |
| S-12 | Tassajara Road | Palisades Drive | North Dublin Ranch Drive | Evaluate opportunities to reduce speed limit along this corridor |

| Project ID | Project Location | From | To | Project Description |
|---|---|---|---|---|
| S-13 | Dougherty Road | Dublin Boulevard | Southern city limits | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-14 | Amador Valley Boulevard | Stagecoach Road | Dougherty Road | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-15 | Tassajara Road | Gleason Drive | Southern City Limits | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate for this location, and implement the chosen separated bicycle treatment. This project is anticipated to be implemented after the lower cost solution in S-7. |
| S-16 | Dublin Boulevard | Inspiration Drive | San Ramon Road | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-17 | Dublin Boulevard | Inspiration Drive | Western extent | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-18 | Fallon Road | Gleason Drive | Southern city limits | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate for this location, and implement the chosen separated bicycle treatment. |
| S-19 | Fallon Road | Gleason Drive | Tassajara Road | Make improvements to adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed. |
| S-20 | Dublin Boulevard | Tassajara Road | Eastern city limits | Add buffered bike lanes along the Dublin Boulevard Extension |
| S-21 | Tassajara Road | Palidsades Drive | Northern City Limits | Work with Contra Costa County to design and implement Class IIB facilities |
| S-22 | Dublin Boulevard | San Ramon Road | Dougherty Road | As recommended in the 2014 plan, upgrade to separated Class I facilities providing sufficient space to reduce conflicts between people walking and biking; evaluate opportunities to improve walkability by reducing obstructions; enhance median and lighting along Dublin Boulevard under I-680; improve sidewalk connection across commercial driveway and at bus stop (east of Regional Street); add pedestrian-scale lighting under I-680 Overpass. Install barrier in median underneath overcrossing to prohibit pedestrian crossings. |
| S-23 | Dublin Boulevard | Dougherty Road | Scarlett Drive | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-24 | Dublin Boulevard | Tassajara Road | Fallon Road | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |

| Project ID | Project Location | From | To | Project Description |
|---|---|---|---|---|
| S-25 | Central Parkway | Tassajara Road | Fallon Road | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility |
| S-26 | Various locations: N Dublin Ranch Drive, S Dublin Ranch Drive, Hansen Drive, Starward Drive, San Sabana Road, Southwick Drive, Hibernia Drive, Donohue Drive, Keegan Street, Peppertree Road, Madden Way, Kohnen Way, York Drive, Maple Drive, Inspiration Drive, and Vomac Road | | | Study opportunities, create designs, and implement traffic calming and signs to create Class III Bikeways along the identified roadways |
| S-27 | Lockhart Street | Central Parkway | Dublin Boulevard | Add a Class IIA Bicycle Lane where no bike lane currently exists |
| S-28 | John Monego Court | Dublin Boulevard | Southern extent | Add a Class IIA Bicycle Lane where no bike lane currently exists |
| S-29 | Sierra Lane | Sierra Court | Dougherty Road | Add a Class IIA Bicycle Lane where no bike lane currently exists |
| S-30 | York Drive | Amador Valley Boulevard | Poplar Way | Add a Class IIA Bicycle Lane where no bike lane currently exists |
| S-31 | Hibernia Drive | Dublin Boulevard | Summer Glen Drive | Add a Class IIA Bicycle Lane where no bike lane currently exists |
| S-32 | Shannon Avenue | Vomac Road | Peppertree Road | Add a Class IIA Bicycle Lane where no bike lane currently exists |
| S-33 | Glynnis Rose Drive | Central Parkway | Dublin Boulevard | Add a Class IIA Bicycle Lane where no bike lane currently exists |
| S-34 | Central Parkway | 500' west of Croak Road | Croak Road | Extend bike lanes and sidepaths along Central Parkway to Croak Road |
| S-35 | Croak Road/Volterra Drive | Volterra Court | Dublin Boulevard | If Croak Road is improved south of S Terracina Drive, add low stress bicycle facilities based on anticipated speeds, volumes, and FHWA Bikeway Selection Guide recommendations |
| S-36 | Central Parkway | Iron Horse Parkway | Tassajara Road | Restripe to add buffer to the Class II facilities and evaluate opportunities to lower speed limit or provide Class IV or Class I facility |
| S-37 | Gleason Drive | Fallon Road | Brannigan Road | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility |
| S-38 | Amador Plaza Road | Southern Extent | Amador Valley Boulevard | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility |
| S-39 | Silvergate Drive | San Ramon Road | Peppertree Road | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility |
| S-40 | Arnold Road | Dublin Boulevard | Southern city limits | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-41 | Dougherty Road | Scarlett Drive | Northern City Limits | Improve wayfinding and signage for parallel path on east side; restripe to upgrade Class IIA facilities to Class IIB facilities |
| S-42 | Lockhart Street | Central Parkway | Gleason Drive | Add a Class IIB bike lane where no bike lane currently exists or improve adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed. |

| Project ID | Project Location | From | To | Project Description |
|---|---|---|---|---|
| S-43 | Stagecoach Road | Amador Valley Boulevard | Northern City Limits | Add a Class IIB Bicycle Lane where no bike lane currently exists |
| S-44 | Sierra Ct | Dublin Boulevard | Northern extent | Add a Class IIB Bicycle Lane where no bike lane currently exists |
| S-45 | Amador Valley Boulevard | Village Parkway | Stagecoach Road | Upgrade from Class IIA to Class IIB Bicycle Lane |
| S-46 | Bent Tree Drive | Fallon Road | East Sugar Hill Terrace | Restripe to a Class IIB Bicycle Lane where no bike lane currently exists |
| S-47 | Hacienda Drive | Gleason Road | Dublin Boulevard | As a follow up to S-3, evaluate opportunities to lower the speed limit or provide Class IV or Class I facility |
| S-48 | Dougherty Road | Dublin Boulevard | Scarlett Drive | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-49 | Hacienda Drive | Dublin Boulevard | Southern city limits | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location, and implement the chosen separated bicycle treatment. This project is anticipated to be implemented after the lower cost solution in S-7. |
| S-50 | San Ramon Road | Dublin Boulevard | Southern city limits | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, and conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment |
| S-51 | Dublin Boulevard | Scarlett Drive | Tassajara Road | Make improvements to adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed. |
| S-52 | Clark Ave/Village Parkway | Dublin Boulevard | Dublin Boulevard | Upgrade from Class IIB to Class IV Bicycle Lane |
| S-53 | Martinelli Way and Iron Horse Parkway | BART Station on Iron Horse Parkway | Hacienda Drive | Add Class I facilities on both sides of the road on Martinelli Way and support the Class I facilities by adding signage, wayfinding, and crossing improvements at the intersections; connect to the BART Station by providing continuous Class I or Class IIA facilities along Iron Horse Parkway. |
| S-54 | Golden Gate Drive | Dublin Boulevard | Amador Valley Boulevard | Add bike lanes with the implementation of the Golden Gate extension project |
| **TRAIL PROJECTS** | | | | |
| T-1 | Iron Horse Regional Trail | | | Implement Phase I and II of the Iron Horse Nature Park Master Plan to create park space and trail access and connectivity improvements |
| T-2 | Downtown Dublin | Regional Street | Amador Plaza Road | Add trail connection from Regional Street to Amador Plaza Road |
| T-3 | East of Tassajara approximately 500 ft | Dublin Boulevard | Central Parkway | With development, add Class I connection between Dublin Boulevard and Central Parkway, just east of Tassajara Road |

| Project ID | Project Location | From | To | Project Description |
|---|---|---|---|---|
| T-4 | Dublin Creek Trail | Amador Plaza Road | San Ramon Road | Add trail connection along Dublin Creek along the Zone 7 channel, to connect at San Ramon Road |
| T-5 | San Ramon Bike Path | Shannon Community Center | San Ramon Bike Path | Create connection to Shannon Community Center from the San Ramon Bike Path |
| T-6 | Alamo Canal Trail | Dublin High School and Village Parkway | Alamo Canal Trail between Cedar Lane and Ebensburg Lane | Add Class I facility along east side of Village to connect to the Alamo Canal Trail |
| T-7 | Dublin Boulevard | Amador Plaza Road | Village Parkway | As recommended in the 2014 plan, widen existing sidewalk and add signing and striping treatments to create a shared use path on the south side of Dublin Boulevard. |
| T-8 | Alamo Canal Trail/ Civic Plaza | Village Parkway/ Clark Avenue | Alamo Canal Trail | Add a bicycle and pedestrian bridge over the canal to create Class I connection between Village Parkway/Clark Avenue at Alamo Canal Trail at the Dublin Public Safety Complex Site |
| T-9 | Dublin Boulevard Extension | Fallon Road | Collier Canyon Park (Livermore) | Create Class I connection along the future Dublin Boulevard Extension corridor from Fallon Road to Collier Canyon Parkway (Livermore) |
| T-10 | Brannigan Street | Central Parkway | Gleason Boulevard | Through development, add Class I facility on the west side of Brannigan St. from Central Parkway to Gleason Boulevard |
| T-11 | Central Parkway | Emerald Glen Park/Tassajara Road | Brannigan Street | Add Class I connection and street crossing enhancements on the north side of Central Parkway from Emerald Glen Park/Tassajara Road to Brannigan Street |
| T-12 | Dublin High School | Iron Horse Trail | Village Parkway | Add Class I connection along the south side of the school grounds and Dublin Swin Center from Iron Horse Trail to Village Parkway |
| T-13 | Tassajara Creek | Dublin Boulevard | Pleasanton | Study options for gap closure to provide a bicycle and pedestrian overcrossing and shared use path from Tassajara Creek at Dublin Boulevard south over I-580 into Pleasanton |
| T-14 | Nielson Elementary School | Amarillo Road | Mape Memorial Park Path | Add Class I connection along the southern edge of Nielson Elementary to connect Amarillo Road with the existing path along Mape Memorial Park to san Ramon Road |
| T-15 | Altamirano Street | Dublin BART station | Martinelli Way | Add Class I connection along Altamirano Street between the Dublin BART station and Martinelli Way |
| T-16 | Croak Road | Dublin Boulevard | Positano Parkway | Add Class I connections along Croak Road from Dublin Boulevard to Positano Parkway |
| T-17 | Positano Parkway | Croak Road | La Strada Drive | Add or improve trails along Positano Parkway to connect to the trail on Croak Road |
| T-18 | Tassajara Creek Trail | Tassajara Road Trailhead | Wallis Ranch development trails | Add Class I connection between the existing Tassajara Creek trailhead on Tassajara Road and trails in the Wallis Ranch development |

# POINT PROJECTS

Crossing projects were identified at locations that represented major barriers to walking and biking, including freeway crossings, high-stress trail crossings, high-stress intersections, and locations that experienced a high frequency or severity of collisions.

The recommended crossing projects are presented in Table 11 and includes:

- Interchange projects to modernize and improve multimodal access and traffic safety, lessening the barriers to walking and biking that are posed by the I-580 and I-680 freeways.
- Crossing projects to improve connections to and along existing Class I paths and trails or to provide mid-block connections across existing roadways.
- Intersection projects to improve safety for people walking and biking by modifying intersection signal timing, geometry, signing, or striping.

Table 11 outlines the recommended crossing projects by location.

**Table 11. Recommended Crossing Projects by Location**

| Project ID | Project Location | Project Description |
|---|---|---|
| **FREEWAY CROSSING PROJECTS** | | |
| FC-1 | San Ramon Road at southbound I-580 westbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-2 | San Ramon Road at northbound I-580 westbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-3 | San Ramon Road at I-580 westbound ramp terminal | Redesign interchange ramp terminal to provide safe crossings |
| FC-4 | St. Patrick Way at I-580 ramp terminal and entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-5 | Dougherty Road at I-580 westbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-6 | Dougherty Road at I-580 westbound ramp terminal | Redesign interchange ramp terminal to provide safe crossings |
| FC-7 | Dougherty Road at I-580 eastbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-8 | Hacienda Drive at I-580 westbound ramp terminal | Redesign interchange ramp terminal to provide safe crossings |
| FC-9 | Hacienda Drive at I-580 eastbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-10 | Hacienda Drive at I-580 westbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-11 | Tassajara Road at I-580 westbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-12 | Tassajara Road at I-580 westbound ramp terminal | Redesign interchange ramp terminal to provide safe crossings |
| FC-13 | Tassajara Road at I-580 eastbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-14 | Fallon Road at I-580 westbound ramp terminal and entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-15 | Fallon Road at I-580 eastbound ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| FC-16 | Village Parkway at I-680 NB ramp entrance | Redesign interchange ramp terminal to provide safe crossings |
| **PEDESTRIAN CROSSING PROJECTS** | | |
| C-1 | Regional Street between Dublin Boulevard and Amador Valley Boulevard | Provide mid-block crossing (RRFB or other actuated treatment) |
| C-2 | Dublin Boulevard and Iron Horse Trail | Provide pedestrian and bicycle overcrossing to connect to Don Biddle Community Park |
| C-3 | Sierra Court cul-de-sac | Add connection from Sierra Court to the Alamo Canal/Iron Horse Trail network |

| Project ID | Project Location | Project Description |
|---|---|---|
| C-4 | Tassajara Creek Trail and Dublin Boulevard | Study the feasibility of improving the crossing of Tassajara Creek Trail at Dublin Boulevard by providing better connections to the existing crossing at John Monego Court. Provide wayfinding and signs to direct people biking and walking between the trail and the intersection. |
| C-5 | Tassajara Creek Trail and Tassajara Road | Improve connections to nearby crossings or add crossing at Tassajara Road and Tassajara Creek Trail (south of Rutherford Drive) to provide access to the trailhead; improve general access to and connectivity from the trail to Tassajara Road and local destinations |
| **INTERSECTION PROJECTS** | | |
| I-1 | Central Parkway/Aspen Street | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school |
| I-2 | Grafton Street/Antone Way | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school |
| I-3 | Amador Valley Boulevard/ Burton Street | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school |
| I-4 | Village Parkway/Amador Valley Boulevard | As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Remove slip lanes; reduce curb radii on all corners; install curb extensions on the SE and SW corners; install directional curb ramps. |
| I-5 | Village Parkway/Tamarack Drive | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-6 | Village Parkway/Brighton Drive | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-7 | Dublin Boulevard/Hibernia Drive | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-8 | Dublin Boulevard/Arnold Road | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-9 | Dublin Boulevard/Hacienda Drive | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |

| Project ID | Project Location | Project Description |
|---|---|---|
| I-10 | Dublin Boulevard/Village Parkway | As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Reduce width of SB right-turn lane and reduce turning radii; remove NB right-turn slip lane and reduce curb radii; reduce curb radii on NE and SE corners; straighten crosswalks. |
| I-11 | Grafton Street/Madden Way/Kohnen Way | Provide higher visibility crossing treatments, especially to support access to the school |
| I-12 | Antone Way/Bridgepointe Lane | Provide higher visibility crossing treatments, especially to support access to the school |
| I-13 | S Dublin Ranch Drive/ Woodshire Lane | Provide higher visibility crossing treatments, especially to support access to the school |
| I-14 | Tassajara Road and Palisades Drive | Add Class I signage, striping, and signal changes to create visibility of people walking and biking across the existing Tassajara Road and Palisades Drive signalized crossing |
| I-15 | Martin Canyon Creek Trail at Silvergate Drive | Provide Class I facilities on the west side of Silvergate Drive and make intersection changes at Hansen Drive and Bay Laurel Street to provide comfortable connectivity to the existing stop controlled intersection at Hansen Drive |
| I-16 | Gleason Drive/Grafton Street | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-17 | Gleason Drive/Brannigan street | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-18 | Central Parkway/Brannigan street | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-19 | Dublin Boulevard/ Brannigan street | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-20 | Central Parkway/Hibernia Drive | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-21 | Central Parkway/Hacienda Drive | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-22 | Dublin Boulevard/Regional Street | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |

| Project ID | Project Location | Project Description |
|---|---|---|
| I-23 | Tassajara Road/Gleason Drive | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-24 | Fallon Road /Central Parkway | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-25 | Dublin Boulevard/Golden Gate Drive | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-26 | Fallon Road /Dublin Boulevard | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. |
| I-27 | Dublin Boulevard/San Ramon Road | As recommended in the 2014 plan, reduce curb radii on all corners; install directional curb ramps at all corners<br>Subject to further analysis, remove NB overlap phase; install pedestrian countdown signals and audible warning signs<br>Stripe crosswalk on south leg subject to further analysis |
| I-28 | San Ramon Road/Amador Valley Boulevard | Consider adding leading pedestrian intervals for all approaches; Consider removing slip lanes on NW and NE corners and add curb extensions on SW, NW, and NE corners pending additional engineering analysis; Consider striping crosswalk on south leg pending additional engineering analysis |
| I-29 | Regional Street/Amador Valley Boulevard | Consider modifying signal to include leading pedestrian interval on EB and WB approaches; Consider protected left-turn phasing for NB and SB traffic. |
| I-30 | Amador Valley Boulevard/ Amador Plaza | Mark crosswalk on east leg of intersection; Widen median and add median tips as feasible to provide 6' pedestrian refuge; Reduce curb radii |
| I-31 | Dublin Boulevard/Amador Plaza Road | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Reduce curb radii on all corners and install directional curb ramps. |
| I-32 | St. Patrick Way/Golden Gate Drive | Install wayfinding signage to West Dublin BART; install bulb-outs at all corners; construct directional curb ramps |
| I-33 | Amador Valley Boulevard/ Donohue Drive | As recommended in the 2014 plan, reduce curb radii on all corners; widen medians and add median tips; install directional curb ramps on all corners |

## OTHER RECOMMENDATIONS

In addition to this Plan's specific recommendations for projects, there are a number of steps that the City can undertake to improve walking and biking in Dublin. The City should implement the program and policy recommendations and the best practices described in the engineering and design guide. Additionally, the City can continue to implement projects from other previous or parallel planning efforts, including those shown in Figure 37 and listed below:

- Dublin Downtown Streetscape Plan
- BART Station Access Projects
- Iron Horse Regional Trail Projects
- Dublin Safe Routes to School Projects
- Local Road Safety Plan Projects

## INCREASED ACCESS TO DESTINATIONS

With implementation of the network recommendations, low-stress biking and comfortable walking and rolling access to key destinations would increase. Existing biking access to BART was compared to biking access with the implementation of the project recommendations. Bicycle access to BART with the existing network and implementation of network recommendations is summarized in Table 12 and shown in Figures 38 and 39.

As demonstrated by this analysis, network recommendations would increase potential bicycle access to BART by almost 600 percent, providing 71 percent of Dublin residents with a travel route along streets that match their stress tolerance.

**Table 12. BART Access by Bicyclist Type**

| Bicyclist Type | Share of Bicyclist Type with Suitable Access to BART | |
|---|---|---|
| | Existing Network | Recommended Network |
| No Way, No How | 0% | 0% |
| Interested but Concerned | 0% | 8% |
| Enthused and Confident | 36% | 51% |
| Strong and Fearless | 52% | 52% |
| Total Across all Biker Types | 6% | 12% |
| Share of population with bicycle routes available that are suitable to their Traffic Stress tolerance | 12% | 71% |

Figure 37. Recommended Projects from Other Plans Map

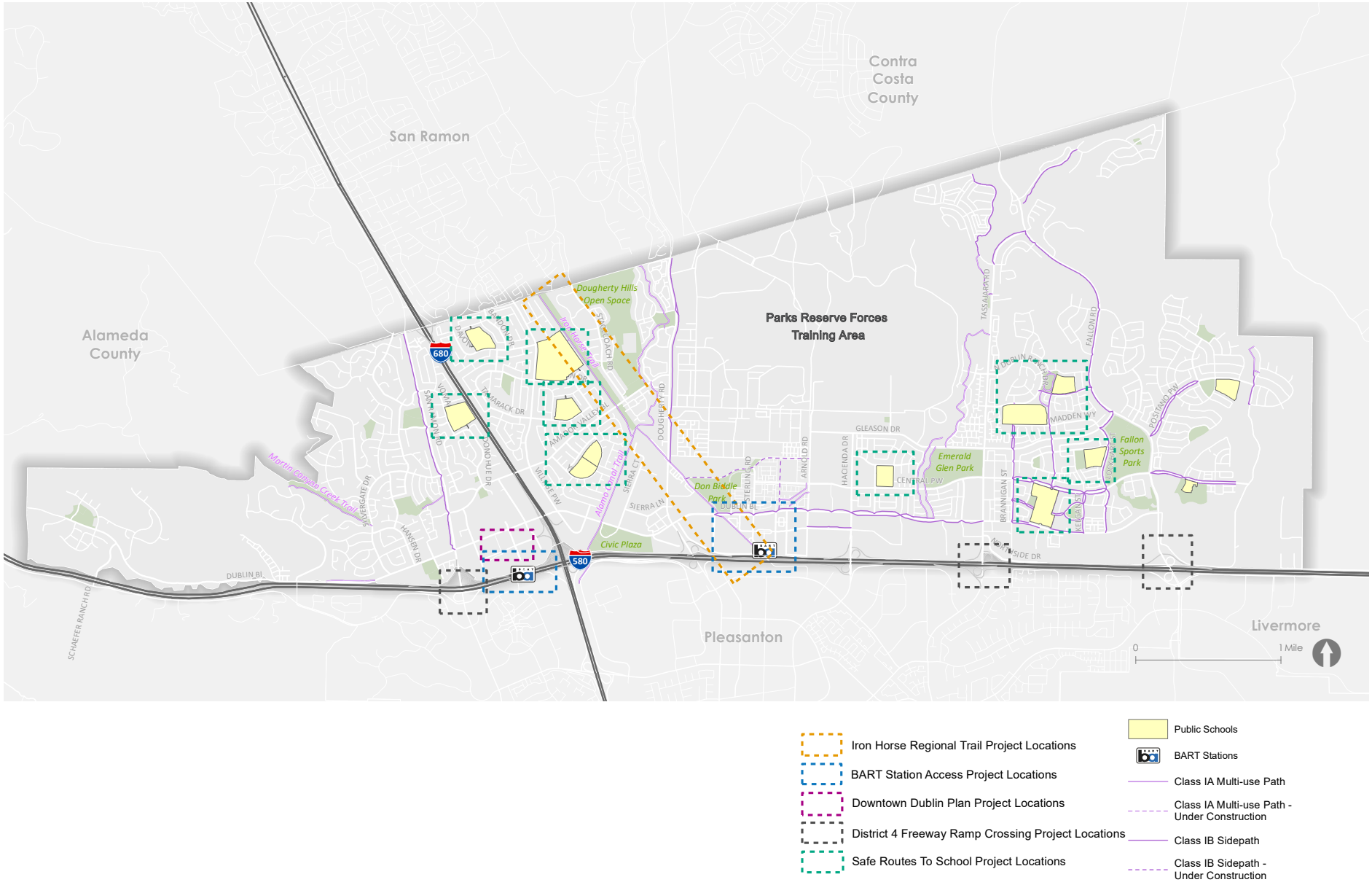


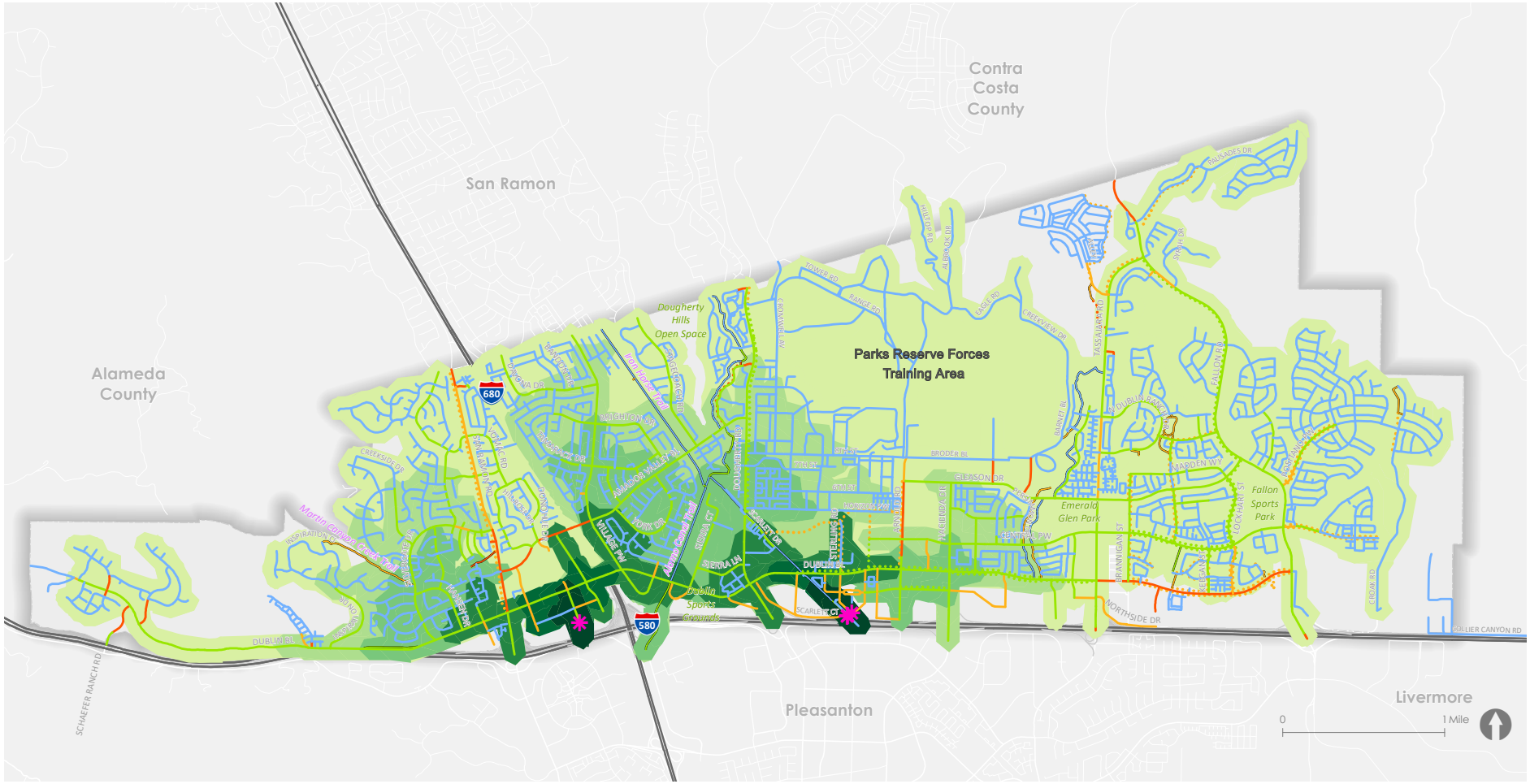
Figure 38. Existing Bike Access to BART Network






DRAFT

Figure 39. Recommended Bike Access to BART Network




**Dublin residents with a bicycle route along streets that match their level of traffic stress tolerance would increase from 12 percent to 71 percent.**



# 5

# 5. RECOMMENDED PROGRAMS, POLICIES, AND PRACTICES

This chapter presents the Plan's recommended programs, policies, and practices. It provides recommended strategies and actions to support walking and biking in the city. It also discusses recommended policies that the City should implement as well as best practices that the City can undertake in developing programs to encourage active transportation in the city. The recommendations are organized into the following categories, which consist of focused topic areas and recommendations:

This chapter also references the Engineering and Design Guide, which was developed as part of this project, as a resource for recommended practices. The guide is included in Appendix D.

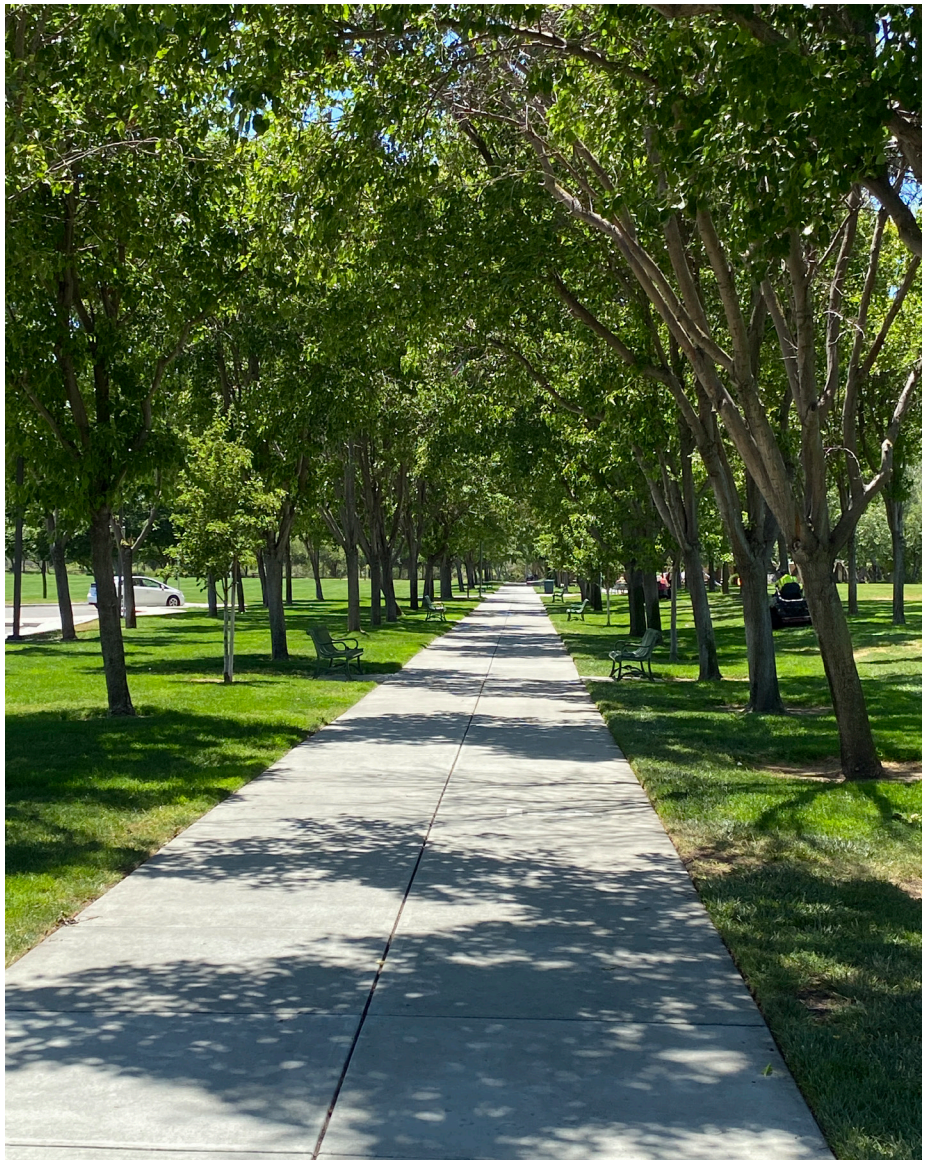


A walk- and bike-friendly Dublin requires investing in infrastructure as well as ongoing programs that encourage and support more people to choose sustainable transportation options. To advance the vision and mission of this Plan, the City of Dublin must envision new policy and program initiatives and expand existing ones.

The following program and policy recommendations are based on feedback from stakeholder interviews as well as guidance from the technical advisory committee, the bicycle and pedestrian advisory committee, a public survey, and online and in-person public engagement. Recommendations are organized into eight topic areas, each of which are supported by specific strategies and actions.

- A strategy is a high-level approach to reach an outcome that works toward larger goals.
- An action is a specific step that advances the strategy.

These strategies and their actions will guide the work of the City's bicycle and pedestrian programs and activities and complement the infrastructure recommendations presented in the previous section. Many factors contribute to the success of a specific action, or strategy—including partner agency support, funding opportunities, and alignment with technological advancement and industry change.



*Dublin, CA Source: City of Dublin*

# COORDINATION AND COLLABORATION

## Establish effective coordination processes and partnerships to advance bicycle and pedestrian projects.

The City cannot reach its goals without the support of other key agencies: those who own, operate, and manage streets and trails, those who provide transit service within the city, and the agencies who fund plans, projects, and programs that advance transportation goals and objectives. The Alameda County Transportation Commission, Metropolitan Transportation Commission, Caltrans, East Bay Regional Parks District (EBRPD), Bay Area Rapid Transit (BART), Livermore Amador Valley Transit Authority (LAVTA), Alameda County Flood Control District (ACFCD), United States Army Parks Reserve Forces Training Area (Camp Parks), Dublin Unified School District (DUSD), and adjacent jurisdictions all play critical roles in how streets and trails function. Because the reach of this Plan covers all city streets and trails regardless of ownership, the jurisdictional roles and responsibilities of agency partners at both the project and system-wide planning level are important and invaluable.

## STRATEGIES AND ACTIONS

**Establish protocols and procedures for coordination of bicycle and pedestrian projects with external agency stakeholders.** Utilize existing regional channels, such as the Tri-Valley Transportation Council, to coordinate bicycle and pedestrian improvement projects that abut or intersect jurisdictional boundaries.

**Coordinate with the East Bay Regional Park District (EBRPD) to provide park access opportunities** with local trails and bike paths and promote green transportation access and compliant accessibility from public transit stops to the regional parks and trails. This is consistent with Public Access 5 and Public Access 7 in the EBRPD Master Plan.

**Designate a City staff member and work with DUSD** to designate a district staff person who is responsible for coordinating issues related to school connectivity and Safe Routes to School.

**Develop templates for access easements and private property paths** and coordinate with developers to advance completion of bicycle and pedestrian connections through and along private property. While the Plan includes specific recommendations for Class I multi-use paths, there is a larger need to highlight the opportunities that new development provides to create active transportation and greenway connections. Future developments should identify how trails can be implemented to complete connections with existing neighborhoods and across barriers. The City should consider how easements can be developed for the use of paths on private property as part of the development review process. Future development sites, especially along Dublin Boulevard, should be evaluated to include or contribute to paths that provide better linkages along and across the street.

**Partner with advocacy groups and community-based organizations to increase awareness of and build support for pedestrian and bicycle projects.** Advocacy groups and community-based organizations are trusted partners that can highlight and elevate community voices. These alliances promote stronger, more meaningful collaborations that can be crucial to advancing active transportation projects and improving project outcomes.

**Work with Dublin Police Services to develop priorities and strategies to promote traffic safety** (e.g., focused enforcement), particularly on high-injury streets and near schools.

# DATA COLLECTION

## Routinely collect trip and facility information to track trends, evaluate projects, and prioritize investments.

Data is crucial to make an evidence-based case for active transportation. Surveys, counts, and infrastructure data provide essential information about the built environment and user habits and experiences. This data can then help explain how projects affect neighborhoods and work toward achieving City and agency goals. By collecting location-specific data related to transportation behaviors, project design elements can be analyzed for their effectiveness and take advantage of opportunities to refine a project's design. Data can also help communicate a project's effects to the public and decision makers as well as track trends over time.

## STRATEGIES AND ACTIONS

**Develop a data collection plan and standard operating procedures** for collection of speed survey data, especially along high-injury segments and other priority locations, such as streets near schools.

**Develop a data collection plan and standard operating procedures** for collection of bicycle and pedestrian counts, especially at activity centers and other priority locations, such as streets near schools.

**Develop and maintain a spatial database and inventory of pedestrian and bicycle facilities and amenities**, including pedestrian-oriented lighting, curb ramps, crosswalks, traffic control devices, bicycle parking, maintenance stations, and multimodal count and vehicle speed data.

**Complement the City's bi-annual bicycle and pedestrian workshops with a written summary documenting progress implementing pedestrian and bicycle projects in the City.** Post the written summary online, through social media channels, and provide a subscription option to facilitate distribution of information to interested community members.

**Ensure that transportation impact analysis (TIA) conducted for new development adheres to the City's Current TIA Guidelines, addresses safety and comfort of people walking and biking, and includes the collection of bicycle and pedestrian counts.** The safety analysis should be data-driven and generally follow best practices outlined in the FHWA's Incorporating Data-Driven Safety Analysis in Traffic Impact Analysis: A How-To Guide. https://safety.fhwa.dot.gov/rsdp/downloads/fhwasa19026.pdf.

## DESIGN

### Go beyond minimum design standards to incorporate safe walking and biking facilities into transportation projects.

Upcoming capital projects should be influenced by the Design Guide, which references the priority networks defined in this Plan, namely the pedestrian priority network and the all ages and abilities network (for biking and micromobility). Design decisions are often most difficult where these two priority networks overlap with major arterials, particularly when the public right of way is constrained. While challenging, these corridors, provide the greatest opportunity to make bold changes that will advance mode shift goals, reduce greenhouse gas emissions, and decrease vehicles miles travelled (VMT).

## STRATEGIES AND ACTIONS

**Adhere to recommendations in the Design Guide** as part of the Plan. Additionally, the City should incorporate best practice design guidance coinciding with Plan updates (at a minimum) and make updates as needed to reflect changes in transportation options, local, State, and national best practices, and new information as a result of research and evaluation of available data. Require new infrastructure projects to adhere to the Design Guide established by this Plan by implementing a design review process that ensures compliance, including for construction work zones. This recommendation is consistent with Climate Action Plan 2030 Measure SM-7: Develop a Built Environment that Prioritizes Active Mobility and supporting actions that improve the pedestrian experience and create a built environment that prioritizes active mobility.

**Develop design standards for the incorporation and use of pedestrian-scale lighting** on new and reconstructed public streets, private streets, and within private development projects. Lighting can enhance the built environment and increase safety and security of people walking and biking. Pedestrian-oriented facility and intersection lighting helps motorists to see people walking and biking and avoid collisions. Pedestrian walkways, crosswalks, transit stops, both sides of wide streets, and streets in commercial areas should be well lit with uniform lighting levels to eliminate dark spots.

**Establish a list of approved traffic calming strategies and devices** to be routinely considered with restriping and other roadway improvement projects**.**

**Continue to include bicycle and pedestrian considerations** during review of new development. Follow best practices for site access and driveway design. example: consolidate or eliminate existing curb cuts and minimize new curb cuts; improve driveway sightlines; and, require parking ramps to include mirrors and messaging to prioritize people walking and biking. Rather than alerting people walking and biking that a car is approaching, messaging should alert drivers that a pedestrian or bicyclist is approaching.

**Coordinate pedestrian and bicycle design with the City's Climate Action Plan and Green Stormwater Infrastructure Plan**.

# EMERGING TECHNOLOGIES AND INNOVATIONS

## Leverage emerging transportation technologies to support travel by sustainable modes.

Today's rapidly advancing technology simultaneously provides opportunities for transformational change and introduces new challenges. Adapting to such change requires anticipating and keeping pace with technology and being responsive to community needs. The greatest challenge is to safely, efficiently, and equitably transition to a transportation future in which everyone benefits from transformational transportation technologies, including ride-hailing, car-sharing, micromobility options, mobile fare payment apps, multimodal trip planning apps, real-time travel information apps, e-commerce apps, and grocery or meal delivery services, just to name a few.

## STRATEGIES AND ACTIONS

**Develop flexible policies to support development of emerging technologies and alternative modes of transportation**, including shared autonomous vehicles, connected vehicles, and micromobility-share services. Policy topics to consider include general provisions, operations, equipment and safety, parking and street design, equity, communications and community engagement, data, and metrics. Consistent with Strategy 3—Sustainable Mobility and Land Use in the Climate Action Plan 2030, the City will work with micromobility and last-mile transportation providers to allow the use of scooters and bike share programs in specific Dublin locations.

**Monitor and evaluate the impact of emerging transportation technologies,** such as bikeshare and scooter share, as well as prominent trends including e-bikes, on walking and biking in Dublin.

**Formulate partnerships to advance implementation of innovative, ambitious, and scalable pilots**, such as micromobility services and mobility hubs.

**Leverage, manage, monitor, and design for new and emerging technologies** that increase visibility and comfort of pedestrians and bicyclists. For example, assess digital wayfinding tools that provide real time information, explore emerging technology such as adaptive lighting, and test new technologies related to pedestrian and bicycle detection and data collection.

**Build a culture of continuous improvement in knowledge, education, and communications** around technologies that advance transportation options. Support and create opportunities for staff training and capacity building through payment of professional memberships and participation in conferences, webinars, and trainings.

**Develop policy for use of e-bikes and personal mobility devices on multi-use paths and trails**, and conduct public safety, education, and outreach campaigns to raise awareness of path etiquette.

# FUNDING AND IMPLEMENTATION

**Increase investment in walking and biking infrastructure and supporting programs. Identify and allocate resources to implement Plan recommendations.**

Walkable and bikeable communities have considerable economic benefits. In addition to capital gains, investment in placemaking and active transportation yield intangible, societal benefits. However, investments in active transportation infrastructure and supporting programs consistently fall short of other transportation investments, and there is a demonstrated need to increase the funding and resources allocated to walking and biking.

## STRATEGIES AND ACTIONS

**Incorporate proposed bicycle and pedestrian projects identified in this Plan** into the development review processes. Develop clear direction for City staff and the development community for implementing bicycle and pedestrian projects.

**Continue to apply for local, state, and federal grants** to support active transportation network improvements and programming.

**Leverage potential grant and alternative funding strategies.** Utilize dedicated funding for bicycle and pedestrian infrastructure projects.

**Add priority bicycle and pedestrian projects identified in this Plan to the Capital Improvement Program.**

**Develop strategies for rapid network implementation and interim, or quick-build, design treatments.** Utilize a quick-build approach, focusing on signing, striping, and markings and lower cost infrastructure modifications to implement near-term treatments that improve safety outcomes for people walking and biking.

**Broaden public involvement efforts and seek to engage the community and solicit feedback on an ongoing basis.** The City strongly encourages public comment, input, and involvement in a wide range of transportation issues. To increase opportunities for community engagement, the City should continue to provide multiple opportunities and various forums for feedback, provide regular/routine communication with the community, and proactively involve the public in the decision-making process.

# OPERATIONS AND MAINTENANCE

## Prioritize operations and maintenance of walking and biking infrastructure to make walking and biking safe and attractive options.

When people decide to walk and bike, the condition of sidewalks, crosswalks, signals, bike lanes, bikeways, and trails are key factors. Inadequately maintained sidewalks and bicycle facilities create hazardous conditions and disrupt network connectivity. Facility quality also influences travel choice and behavior. Implementation of pedestrian- and bicycle-friendly signal timing operations and maintaining good sidewalk, street, and trail conditions are critical components of an accessible bicycle and pedestrian network.

## STRATEGIES AND ACTIONS

**Utilize flexibility created through the passage of Assembly Bill 43 to set safe speed limits in key areas within the city.** The City should implement changes authorized in AB 43 and utilize guidance outlined in City Limits from the National Association of City Transportation Officials (NACTO) to reduce default speed limits (1) on streets designated as safety corridors or high injury corridors (streets that have the highest number of serious injuries and fatalities); (2) in designated slow zones; and (3) on other designated corridors using a safe speed study. Under the provision that went into effect in January 2022, the City should move to lower speed limits by 5 miles per hour (from 25 mph to 20 mph or from 30 mph to 25 mph) in key business activity districts, streets where at least half of the property uses are dining or retail. Under the provision that goes into effect in June 2024, the City should reduce speeds by 5 mph on streets designated as safety corridors according to a definition that will be established by Caltrans's roadway standards manual.

**Develop policy and guidance for modifications to traffic signal operations,** including implementing leading pedestrian intervals, providing automatic recall, installing accessible pedestrian signals, implementing no right turn on red, and implementing protected-only left-turn phases.

**Establish, update, and implement maintenance policies and standards for bicycle and pedestrian facilities on City right of way.** Review the existing Class I Facility Maintenance Plan (2015), and develop a standard maintenance plan for bicycle facilities of all types in the city that accounts for factors such as signing and striping maintenance and sweeping protocols. Continue to collaborate with East Bay Regional Parks District to coordinate maintenance efforts for off-street facilities in the city. When deciding which facilities to maintain first, prioritize facilities with the highest ridership and those that provide access to schools, business districts, major employers, major transit centers, and other important destinations.

# PROMOTION AND ENCOURAGEMENT

## Encourage and promote increased use of sustainable travel modes, especially walking and biking.

Active travel, including walking and biking, benefits physical and mental health as well as the environment. To promote active travel, the City must provide convenient, safe, and connected walking and biking infrastructure. But implementing programs and campaigns that provide targeted information or incentives can also motivate people to walk or bike. The recommendations focus on non-infrastructure or programmatic elements that emphasize active travel as a convenient and healthy option.

## STRATEGIES AND ACTIONS

**Continue to create a digital and printed citywide pedestrian and bike network and amenities map.**

**Coordinate with local organizations to create programs and events that support active transportation and enhance the built environment.** Sample topics include open streets, slow streets, temporary street closures, and pavement to parks, parklets, and plazas. This recommendation is consistent with the Downtown Dublin Streetscape Plan Guideline 3.2.6 Parklets and Guideline 3.2.7 Street Closures.

**Continue to partner with Alameda CTC and DUSD to deliver Safe Routes to School assessments and programs.** Encourage all Dublin schools to participate.

**Consider steps to becoming a Bicycle Friendly Community** through the League of American Bicyclists. The program provides a roadmap to improving conditions for bicycling and guidance to help make a community's vision for a better, bikeable community a reality. A Bicycle Friendly Community welcomes bicyclists by providing safe accommodations for bicycling and encouraging people to bike for transportation and recreation.

**Encourage businesses to be recognized as Bicycle Friendly Businesses** through the League of American Bicyclists. The program recognizes employers for their efforts to encourage a more welcoming atmosphere for bicycling employees, customers, and the community. Interested business can apply here: https://www.bikeleague.org/business.

**Develop and implement a citywide transportation demand management (TDM) program** to support additional transportation options, incentives to choose sustainable modes, and supplemental infrastructure improvements identified in this Plan. The TDM program should include guidance for staff on requirements for new development, including bicycle parking and policy strategies (such as density bonus for vehicle parking reductions) and vehicle parking strategies (such as shared and priced parking).

This recommendation is consistent with (1) Measure 3: Develop a Transportation Demand Management Plan in Strategy 3: Sustainable Mobility and Land Use Measure and (2) Measure ML-2: Reduce Municipal Employee Commute GHG Emissions; and (3) the Climate Action Plan 2030. The TDM Plan will identify strategies to help facilitate the move from single-occupancy vehicles to less carbon intensive transportation modes, like walking and biking.

# SUPPORTING INFRASTRUCTURE AND AMENITIES

## Provide supportive infrastructure and amenities to make walking and biking convenient and comfortable.

On any given street, careful and thoughtful design of the built environment affects accessibility, legibility, a sense of place, and security. The features that give a street character are often found in the frontage or amenity zones; key elements include supporting infrastructure like lighting, wayfinding, bicycle parking, benches, green stormwater infrastructure, transit stops, and mobility hubs.

## STRATEGIES AND ACTIONS

**Require short-term and long-term parking that accommodates various types of bicycles, skateboards, and scooters.** Install new short- and long-term parking to meet the recommendations and requirements outlined in the Design Guide. For example, provide electric outlet near long-term parking to accommodate electric bicycles and provide bicycle parking spaces that allow for a footprint of 3 feet by 10 feet in a horizontal rack.

**Consider adding or improving bicycle parking and providing other bicycle amenities,** such as lighting, maintenance stations, shaded benches, and drinking fountains in City parks, at trailheads, community centers, transit stops, BART stations, Park and Ride lots, and in other high travel areas.

**Develop a bicycle and pedestrian wayfinding plan and install wayfinding throughout the city.** The plan should refer to and coordinate with recommendations identified in the Public Art Program and Downtown Dublin Streetscape Master Plan. This recommendation is consistent with the Downtown Dublin Streetscape Plan Guideline 4.2.2 Wayfinding.



# 6

# 6. IMPLEMENTATION STRATEGY

This Plan's infrastructure and programmatic recommendations provide strategies and actions to help Dublin become a more walkable and bikeable city. Implementation of these recommendations will occur over time, depending on available resources and funding sources. This chapter provides an overview and outcomes of the prioritization process, estimated project costs, and a matrix of applicable funding sources to advance implementation.

## PRIORITIZATION PROCESS

The project recommendations include a total of 56.8 miles across 54 segment projects; 18 trail projects; 16 freeway crossing projects; 5 pedestrian crossing projects; and 33 intersection projects. Prioritizing these projects is essential to optimize use of staff time and resources.

The National Cooperative Highway Research Program (NCHRP) Report 803: ActiveTrans Priority Tool (APT) prioritization process was used to identify priority locations for pedestrian and bicycle projects that improve conditions for people walking, biking, and rolling in Dublin.[6] The prioritization process and outcomes are summarized in this section and additional discussion is provided in appendix F.

The APT methodology uses a standard set of terms and definitions to describe the different steps in the process. The following definitions apply within the APT:

- **Factors** are categories used to express community or agency values considered in the prioritization process and contain groups of variables with similar characteristics.
- **Weights** are the numbers used to indicate the relative importance of different factors based on community or agency values.
- **Variables** are characteristics of roadways, households, neighborhood areas, and other features that can be measured, organized under each factor. The terms *variables* and *evaluation criteria* may be used interchangeably.
- **Scaling** is the process of making two variables comparable to one another (e.g., number of collisions versus population density).

The prioritization factors and evaluation criteria (or variables) shown in Table 13 align with the Plan's goals, and they were developed in collaboration with the City, the Technical Advisory Committee and the Bicycle and Pedestrian Advisory Committee. Variables were given equal weight in the analysis.

6 Peter A. Lagerwey, et al. Pedestrian and Bicycle Transportation Along Existing Roads—*ActiveTrans Priority Tool Guidebook,* NCHRP Report 803, Project No. 07-17 (2015), http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_803.pdf.

Table 13. Prioritization Factors and Variables

| FACTOR | VARIABLE | NOTES | PEDESTRIAN | BICYCLE |
|---|---|---|---|---|
| Safety | High-injury corridors | Prioritize locations identified along the bicycle and pedestrian high-injury networks. This variable aligns with the *goal enhance safety*. |  |  |
| Social Equity | Youth and senior population | Prioritizes locations with high scores indicating where investment would promote positive outcomes for vulnerable road users (youth and senior populations). This variable aligns with the goals *improve connectivity and enhance accessibility*. |  |  |
| Connectivity | Demand analysis | Prioritize locations with high potential for walking and biking to unlock latent demand. This variable aligns with the goal *improve connectivity*. |  |  |
| | Proximity to schools | Prioritize locations within one mile of schools to provide increased opportunities to bike and walk to school. This variable aligns with the goal *improve connectivity*. |  |  |
| Quality of Service | Bicycle level of traffic stress | Prioritize locations based on the presence of existing high-stress riding facilities. This variable aligns with the goal *increase walking and biking*. | |  |
| | Sidewalk gaps | Prioritize locations with sidewalk gaps that may create barriers for people walking. This variable aligns with the goal *improve connectivity*. |  | |
| Major Barriers | Freeway crossings | Prioritize improving safety and quality of service for ramp terminal intersection and freeway crossings. This variable aligns with the goal *improve connectivity*. |  |  |
| Consistency with Past Planning | Previously identified projects | Prioritize locations of pedestrian and bicycle projects that were identified in the previous plan. This variable aligns with the goal *prioritize investments*. |  |  |

## IMPLEMENTATION PLAN

After applying the evaluation criteria and conducting the prioritization analysis, three tiers of recommendations emerged.

The infrastructure projects were divided into three tiers, representing the following:

- **Tier I:** High priority projects with likely funding or implementation sources
- **Tier II:** High priority projects with no identified funding source
- **Tier III:** Lower priority investments that support a full low-stress walking, biking, and rolling network across the City

## TIER I PROJECTS

Nine segment projects, one trail projects, two crossing project, and three intersection projects were identified as Tier I projects. The Tier I projects include a complete streets study, striping and signage for high-stress streets scheduled for repaving over the next three years, four new actuated crossings near schools, and a bicycle and pedestrian overcrossing bridge. Tier I projects, those most likely to be implemented in the next several years, are shown in Figure 40.

## TIER II PROJECTS

Ten segment projects, one crossing project, and seven intersection projects were identified as Tier II projects. Tier II projects were identified using the same prioritization criteria and framework as Tier I projects, with input from City staff and through public engagement. Tier II projects are high priority projects that may require additional feasibility analysis and concept design development prior to implementation. The list of Tier II projects is presented in Table 15 and the comprehensive prioritized list of projects is presented in Appendix C.

## TIER III PROJECTS

Tier III projects include the remaining recommendations that increase the safety and comfort of people walking, biking, and rolling in the city.

While Tier III projects are not listed in the implementation plan projects in Table 15, they can be found in the full list of projects provided in Table 6 in the Recommended Bicycle and Pedestrian Networks section.

# CITYWIDE POLICIES AND PROGRAMS

A total of 41 strategies and actions were recommended in one of eight policy and program topic areas. These recommendations will guide the City's bicycle and pedestrian programs and activities and complement the infrastructure recommendations.

## COST ESTIMATES

The total cost of all the projects identified in this Plan is between $103 and $214 million (see Table 14). This cost includes adding bicycle facilities, upgrading bicycle facilities, updating or adding pedestrian crossings, updating pedestrian facilities, adding street trees, redesigning interchange ramps, and adding signage.

Table 14 shows the estimated cost for all projects, including planning-level costs and soft costs for engineering, design support, and contingency. Although the cost estimates vary most based on bicycle facility type and how that facility will be implemented, pedestrian and transit costs are equally important and included on a per-mile basis in each cost as well. Costs for the individual corridors can be found in the full project list in appendix G. Cost estimates' high ends consider a need to move the curb, therefore upgrading all pedestrian facilities (sidewalks, street trees, ADA ramps, etc.) while the low costs can be implemented through restriping the roadway. If all segment projects were able to be implemented through roadway reorganization, restriping, or minor additional treatments, it would cost approximately $103 million to implement the Plan. If reconstructing the curb to implement each segment project, the Plan is expected to cost about $214 million.

Planning-level cost estimates vary depending on project context, which includes type of facility, existing conditions, right of way acquisition, and desired functional and aesthetic improvements like landscaping or hardscaping. Project costs were adjusted to include variable costs for engineering, design support, and contingency. Cost estimates were calculated using a combination of inputs from the City and the Federal Highway Administration (FHWA) Pedestrian and Bicycle Safety Guide. Moving forward, the City will need to develop detailed estimates during the preliminary engineering stage to calculate more accurate project costs. These more-detailed estimates are important due to the varying costs of obtaining right of way, construction, drainage, and grading. Right of way should also be considered in preliminary engineering, as the listed cost estimates do not include right of way costs. Many projects can be implemented without purchasing additional right of way by reallocating space within the existing right of way.

Cost estimates for support programs are not provided, as the costs to implement these programs can vary greatly. Prior to implementing support programs, the City should outline the necessary element of each program and establish a cost. For example, to understand what an open streets or slow streets program would need, the City could consider questions such as how often streets would need to close and how much those closures would cost.

Table 14. Total Project Costs

| PROJECT TYPE | MILES | LOW COST | HIGH COST |
|---|---|---|---|
| Shared Lane (Class III) | 12.4 miles | $1,698,000 | $1,698,000 |
| Bike Lane (Class IIA) | 3.1 miles | $4,177,000 | $17,757,000 |
| Buffered Bike Lane (Class IIB) | 17.0 miles | $3,239,000 | $39,421,000 |
| Complete Streets Study: Separated Facility (Class I or Class IV) | 10.4 miles | $13,440,000 | $52,048,000 |
| Complete Streets Study: Consider Improvements to Existing Sidepath (Class IB) | 4.9 miles | $5,460,000 | $8,307,000 |
| Shared Use Path/Paved Trail (Class IA) | 7.9 miles | $40,428,776 | $40,550,480 |
| Speed Reduction Evaluation (exclusively) | 1.3 miles | $139,000 | $2,753,000 |
| Freeway Crossing Projects | 16 | $17,840,000 | $17,840,000 |
| Pedestrian Crossing Projects | 5 | $9,520,000 | $9,520,000 |
| Intersection Projects | 33 | $7,393,000 | $24,274,000 |
| **Total** | | **$ 103,335,000** | **$ 214,168,000** |

**Table 15. Implementation Plan List: Tier I and Tier II Projects**

| PROJECT ID | TIER | PROJECT DESCRIPTION | PROJECT LOCATION | TO | FROM | LOW COST* | HIGH COST** |
|---|---|---|---|---|---|---|---|
| S-1 | Tier I | Study opportunities and create designs for traffic calming, striping, and signs to create Class III bikeways | Various locations for Class III facilities/neighborhood bikeways: Tamarack Drive, Davona Drive, St. Patrick Way, Lucania Street, Brighton Drive, Grafton Street, Antone Way, South Bridgepointe Lane, and Brannigan Street | | | $25,000 | $25,000 |
| S-2 | Tier I | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) | Gleason Drive | Arnold Road | Brannigan Street | $239,000 | $176,000 |
| S-3 | Tier I | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) | Hacienda Drive | Southern City Limits | Gleason Drive | $106,000 | $176,000 |
| S-4 | Tier I | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) | Dublin Boulevard | Scarlett Drive | Tassajara Road | $229,000 | $176,000 |
| S-5 | Tier I | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future and evaluate opportunities to lower speed limit; if speeds are not lowered, as a future phase provide a separated facility (Class I or Class IV) | Arnold Road | Dublin Boulevard | Altamirano Ave | $53,000 | $176,000 |
| S-6 | Tier I | Convert to a Class IIB bikeway through restriping | Grafton Street | Kohnen Way | Antone Way | $42,000 | $176,000 |
| S-7 | Tier I | Convert to a Class IIB bikeway by restriping travel lanes on Tassajara, Dougherty, and Hacienda at the I-580 overcrossings | Tassajara Road, Dougherty Road, and Hacienda Drive | Southern City Limits | Dublin Boulveard | $150,000 | $176,000 |
| S-8 | Tier I | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) | Tassajara Road | North Dublin Ranch Drive | Rutherford Drive | $138,000 | $5,334,000 |
| S-9 | Tier I | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Village Parkway | Amador Valley Boulevard | Northern City Limits | $945,000 | $5,601,000 |
| S-10 | Tier II | Implement the traffic calming, striping, and signs plans and designs created in project S-1 to create Class III bikeways | Various locations for Class III facilities/neighborhood bikeways: Tamarack Drive, Davona Drive, St. Patrick Way, Lucania Street, Brighton Drive, Antone Way, South Bridgepointe Lane, and Brannigan Street | | | $691,000 | $135,000 |
| S-11 | Tier II | Restripe to add buffer to the Class II facilities and evaluate opportunities to lower speed limit or provide a Class IV or Class I facility | Village Parkway | Dublin Boulevard | Amador Valley Boulevard | $91,000 | $5,334,000 |

* Restriping ** Full Reconstruction

| PROJECT ID | TIER | PROJECT DESCRIPTION | PROJECT LOCATION | TO | FROM | LOW COST* | HIGH COST** |
|---|---|---|---|---|---|---|---|
| S-12 | Tier II | Evaluate opportunities to reduce speed limit along this corridor | Tassajara Road | Palisades Drive | North Dublin Ranch Drive | $18,000 | $25,000 |
| S-13 | Tier II | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dougherty Road | Dublin Boulevard | Southern city limits | $274,000 | $5,601,000 |
| S-14 | Tier II | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Amador Valley Boulevard | Stagecoach Road | Dougherty Road | $331,000 | $5,601,000 |
| S-15 | Tier II | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate for this location, and implement the chosen separated bicycle treatment. This project is anticipated to be implemented after the lower cost solution in S-7. | Tassajara Road | Gleason Drive | Southern City Limits | $505,000 | $5,601,000 |
| S-16 | Tier II | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dublin Boulevard | Inspiration Drive | San Ramon Road | $1,212,000 | $5,601,000 |
| S-17 | Tier II | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dublin Boulevard | Inspiration Drive | Western extent | $1,653,000 | $5,601,000 |
| S-18 | Tier II | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate for this location, and implement the chosen separated bicycle treatment. | Fallon Road | Gleason Drive | Southern city limits | $1,322,000 | $5,601,000 |
| S-19 | Tier II | Make improvements to adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed. | Fallon Road | Gleason Drive | Tassajara Road | $238,000 | $999,000 |
| S-20 | Tier II | Add buffered bike lanes along the Dublin Boulevard Extension | Dublin Boulevard | Tassajara Road | Eastern city limits | $259,000 | $5,466,000 |
| S-21 | Tier II | Work with Contra Costa County to design and implement Class IIB facilities | Tassajara Road | Palidsades Drive | Northern City Limits | $80,000 | $5,466,000 |
| S-22 | Tier II | As recommended in the 2014 plan, upgrade to separated Class I facilities providing sufficient space to reduce conflicts between people walking and biking; evaluate opportunities to improve walkability by reducing obstructions; enhance median and lighting along Dublin Boulevard under I-680; improve sidewalk connection across commercial driveway and at bus stop (east of Regional Street); add pedestrian-scale lighting under I-680 Overpass. Install barrier in median underneath overcrossing to prohibit pedestrian crossings. | Dublin Boulevard | San Ramon Road | Dougherty Road | $4,956,000 | $3,304,000 |

* Restriping ** Full Reconstruction

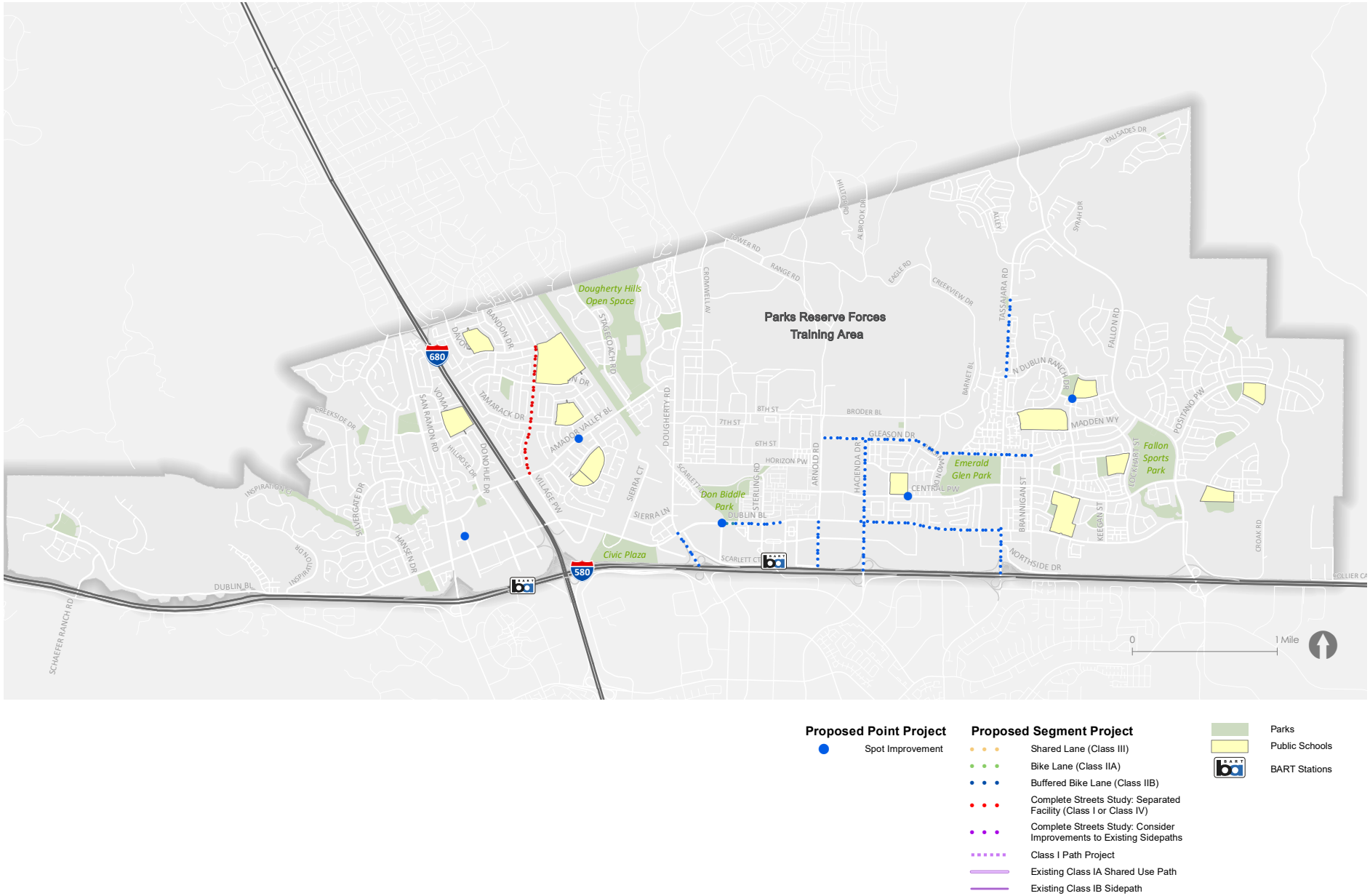
| PROJECT ID | TIER | PROJECT DESCRIPTION | PROJECT LOCATION | TO | FROM | LOW COST* | HIGH COST** |
|---|---|---|---|---|---|---|---|
| S-23 | Tier II | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dublin Boulevard | Dougherty Road | Scarlett Drive | $497,000 | $4,375,000 |
| S-24 | Tier II | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dublin Boulevard | Tassajara Road | Fallon Road | $1,322,000 | $5,740,000 |
| S-25 | Tier II | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility | Central Parkway | Tassajara Road | Fallon Road | $227,000 | $4,558,000 |
| T-1 | Tier I | Implement Phase I and II of the Iron Horse Nature Park Master Plan to create park space and trail access and connectivity improvements | Iron Horse Regional Trail | 0 | 0 | $11,560,000 | $11,560,000 |
| T-2 | Tier II | Add trail connection from Regional Street to Amador Plaza Road | Downtown Dublin | Regional Street | Amador Plaza Road | $765,000 | $765,000 |
| T-3 | Tier II | With development, add Class I connection between Dublin Boulevard and Central Parkway, just east of Tassajara Road | East of Tassajara approximately 500 ft | Dublin Boulevard | Central Parkway | $621,000 | $621,000 |
| C-1 | Tier I | Provide mid-block crossing (RRFB or other actuated treatment) | Regional Street between Dublin Boulevard and Amador Valley Boulevard | | | $320,000 | $320,000 |
| C-2 | Tier I | Provide pedestrian and bicycle overcrossing to connect to Don Biddle Community Park | Dublin Boulevard and Iron Horse Trail | | | $6,318,000 | $6,318,000 |
| C-3 | Tier II | Add connection from Sierra Court to the Alamo Canal/Iron Horse Trail network | Sierra Court cul-de-sac | | | $2,132,000 | $2,132,000 |
| I-1 | Tier I | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school | Central Parkway/Aspen Street | | | $320,000.00 | $320,000 |
| I-2 | Tier I | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school | Grafton Street/Antone Way | | | $320,000.00 | $320,000 |
| I-3 | Tier I | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school | Amador Valley Boulevard/Burton Street | | | $320,000.00 | $320,000 |
| I-4 | Tier II | As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Remove slip lanes; reduce curb radii on all corners; install curb extensions on the SE and SW corners; install directional curb ramps. | Village Parkway/Amador Valley Boulevard | | | $123,000.00 | $972,000 |

* Restriping ** Full Reconstruction

| PROJECT ID | TIER | PROJECT DESCRIPTION | PROJECT LOCATION | TO | FROM | LOW COST* | HIGH COST** |
|---|---|---|---|---|---|---|---|
| I-5 | Tier II | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Village Parkway/Tamarack Drive | | | $123,000.00 | $972,000 |
| I-6 | Tier II | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Village Parkway/Brighton Drive | | | $123,000.00 | $972,000 |
| I-7 | Tier II | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Hibernia Drive | | | $123,000.00 | $972,000 |
| I-8 | Tier II | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Arnold Road | | | $123,000.00 | $972,000 |
| I-9 | Tier II | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Hacienda Drive | | | $123,000.00 | $972,000 |
| I-10 | Tier II | As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Reduce width of SB right-turn lane and reduce turning radii; remove NB right-turn slip lane and reduce curb radii; reduce curb radii on NE and SE corners; straighten crosswalks. | Dublin Boulevard/Village Parkway | | | $123,000.00 | $972,000 |
| | | | | | Total Tier I | $21,085,000 | $27,589,000 |
| | | | | | Total Tier II and Tier III | $82,250,000 | $186,580,000 |
| | | | | | Total (all tiers) | $103,335,000 | $ 214,169,00 |

* Restriping ** Full Reconstruction

Figure 40. Tier I Projects Map



## FUNDING SOURCES

Active transportation projects in Dublin have typically been funded through a combination of ballot measure monies (e.g., Alameda County Measure B and BB), the City General Fund, developer-funded projects, and State, regional, and federal grants. There are many funding sources and programs available at the federal, state, regional, countywide, and local levels for pedestrian and bicycle projects. The Federal Highway Administration (FHWA) alone identifies almost 20 different sources across United States Department of Transportation (USDOT) funding programs that can be used to support active transportation improvements such as bike racks for transit vehicles and new sidewalks and separated bike lanes.

On November 15, 2021, President Joe Biden signed into law the Bipartisan Infrastructure Law (BIL), also called the Infrastructure Investment and Jobs Act (IIJA). The law authorizes $1.2 trillion for federal investments in transportation, broadband access, clean water, and electric grid renewal. The USDOT will distribute funds over five years through more than two dozen targeted competitive grant programs for initiatives like better roads and bridges, investments in public transit, and resilient infrastructure. This program and other relevant funds are summarized in Table 16 along with current funding levels, applicable project type, and limitations.

**Table 16. Funding Sources**

| FUND NAME | PROJECT ELIGIBILITY & LIMITATIONS | FUNDING LEVELS |
|---|---|---|
| **LOCAL** | | |
| General Fund | Capital improvements without other funding sources regularly available. Relevant projects receiving funding through the General Fund as identified in the 2022-2027 Capital Improvement Program (CIP) include Citywide Bicycle and Pedestrian Improvements, Downtown Dublin Street Grid Network, and San Ramon Trail Lighting. | Approximately $700,000 was allocated to projects that included bicycle and pedestrian enhancements in 2021-2022 and a total of $342,000 has been allocated over the 2022-2027 period, per the CIP. |
| Impact Fees & Developer Mitigation | Capital improvements, including streetscape enhancements, that would improve conditions for people walking and biking. Current impact fees include Eastern Dublin Transportation Impact Fee, Western Dublin Transportation Impact Fee, Dublin Crossing Transportation Fee, Tri-Valley Transportation Development Fee, and Dublin Crossing Fund. | Impact fees contributed $2,400,000 in 2021-2022 and are anticipated to fund almost $1,000,000 of pedestrian and bicycle-related projects 2022-2027. The St Patrick Way Extension is a developer-funded project (about $3,750,000) that includes pedestrian and bicycle facilities. |

| FUND NAME | PROJECT ELIGIBILITY & LIMITATIONS | FUNDING LEVELS |
|---|---|---|
| **COUNTYWIDE AND REGIONAL** | | |
| Measure B and Measure BB | Bicycle and Pedestrian Program: Capital project, programs, and plans that directly address bicycle and pedestrian access, convenience, safety, and usage. Cannot be used for repaving an entire roadway or for programs that exclusively serve city staff.<br>Local Streets and Roads Program: Capital projects, programs, maintenance, or operations that directly improve local streets and roads and local transportation. Cannot be used for programs that exclusively serve city staff. | MEASURE B: $1,400,000 allocated in 2021-2022 & $300,000 allocated in 2022-2027 to Annual Street Repaving, Citywide Bicycle and Pedestrian Improvements and the Iron Horse Trail Bridge at Dublin Boulevard.<br>MEASURE BB: $6.5 million of Measure BB funds was allocated to bicycle and pedestrian projects in 2021-22, including $5.2 million from Measure BB Grants. Approximately $4.7 million has been allocated in 2022-27. |
| Measure RR | Projects are required to make the BART system safer, more reliable, and to reduce traffic. | $1,500,000 allocated to Iron Horse Bridge at Dublin Boulevard in 2021-22 and no funding is allocated to bicycle or pedestrian projects in 2022-27. |
| One Bay Area Grant (OBAG) | Local street and road maintenance, streetscape enhancements, bicycle and pedestrian improvements, Safe Routes to School projects, and transportation planning.<br>Most projects must be in a priority development area (PDA) or have a connection to one. | $916 million in OBAG 2 regionwide[7]<br>$750 million in OBAG 3 for projects from 2023-26 with additional funds anticipated through the 2021 Bipartisan Infrastructure Law.[8] |
| Transportation Development Act (TDA) Article 3[9] | Design and construction of walkways, bike paths, bike lanes, and safety education programs.<br>Project must be in an adopted plan.<br>All projects must be reviewed by Bicycle and Pedestrian Advisory Committee (BPAC). | $3 million annually every 2–3 years regionwide |
| **STATEWIDE** | | |
| Statewide Gas Tax Revenue | Construction, engineering, and maintenance.<br>Ineligible expenses include decorative lighting, transit facilities, park features, and new utilities. | $2 million allocated in 2021-22 and $3.7 million allocated in 2022-27. |
| Road Maintenance and Rehabilitation Account (RMRA) | Road maintenance and rehabilitation, safety improvements, railroad grade separations, traffic control devices, and complete streets components.<br>If it has a pavement condition index (PCI) of 80 or more, a city may spend its RMRA funds on other transportation priorities. Dublin has a PCI greater than 80.[10] | 1.8 million in 2021-22 and $5.6 million in 2022-27 for Annual Street Resurfacing and Iron Horse Bridge at Dublin Boulevard |

7 https://mtc.ca.gov/funding/federal-funding/federal-highway-administration-grants/one-bay-area-grant-obag-2

8 https://mtc.ca.gov/funding/federal-funding/federal-highway-administration-grants/one-bay-area-grant-obag-3

9 https://mtc.ca.gov/our-work/fund-invest/investment-strategies-commitments/transit-21st-century/funding-sales-tax-and-0.

10 https://www.dublin.ca.gov/1955/Pavement-Management-Program

| FUND NAME | PROJECT ELIGIBILITY & LIMITATIONS | FUNDING LEVELS |
|---|---|---|
| Active Transportation Program (ATP)[11] | Infrastructure projects and plans, including bicycle and pedestrian projects, active transportation plans, quick build projects, and Safe Routes to School Plans, as well as education and encouragement activities. Funding cannot be used for funded projects or for cost increases. Scoring criteria favors projects located in or benefiting equity priority (disadvantaged) communities. | $1.65 billion for Cycle 6 (2023) up from $223 million in Cycle 5. The State budget bill added $1 billion in June 2022 after applications were submitted. Biannual program |
| Sustainable Communities | Multimodal transportation and land use planning projects that further the region's Sustainable Communities Strategy. Requires 11.47 percent local match. | $29.5 million, split between statewide and regional competitive funds |
| Strategic Partnerships | Planning efforts that identify and address statewide, interregional, and regional transportation deficiencies on the state highway system in partnership with Caltrans. Requires 20 percent local match. Would require Dublin to apply as sub-applicant to Metropolitan Transportation Commission (MTC). | $4.5 million, $3 million of which is dedicated to projects related to transit |
| State Highway Operation and Protection Program (SHOPP)[12] | Repair and preservation, emergency repairs, safety improvements, and some highway operational improvements. Elements include pavement, bridges, culverts, and transportation management systems. Projects must be on the California State Highway System. | $18 billion statewide for 4 years Portfolio updated every 2 years |
| State Transportation Improvement Program (STIP) | Any transportation project eligible for State Highway Account or federal funds. Projects need to be nominated in Regional TIP, but MTC may nominate fund categories. | $71 million for Alameda County[13] Updated every 2 years |
| **FEDERAL** | | |
| Active Transportation Infrastructure Investment Program | Projects that connect active transportation infrastructure. | $1 billion nationally |
| Highway Safety Improvement Program (HSIP) | Focuses on infrastructure treatments with known crash reduction factors, such as countermeasures at locations with documented collision and safety issues. | $263 million allocated statewide for 2022 |
| Rebuilding American Infrastructure with Sustainability and Equity (RAISE) | Major infrastructure projects, especially with road, bridge, transit, or intermodal components. Minimum grant size of $5 million. It is possible to propose a program (or network) of projects that address the same transportation challenge. | $2.275 billion nationally |
| Safe Streets & Roads for All (SS4A) | Comprehensive safety action plan development and implementation. | $6 billion nationally |
| PROTECT Resilience Grants | Transportation resilience planning and project implementation. | $1.4 billion nationally |
| Reconnecting Communities | Removing or retrofitting highways to restore community connectivity. | $1 billion nationally |

11 https://catc.ca.gov/programs/active-transportation-program

12 http://www.dot.ca.gov/hq/transprog/SHOPP/2018_shopp/2018-shopp-adopted-by-ctc.pdf

13 https://catc.ca.gov/-/media/ctc-media/documents/programs/stip/2022-stip/2022-adopted-stip-32522.pdf

| FUND NAME | PROJECT ELIGIBILITY & LIMITATIONS | FUNDING LEVELS |
|---|---|---|
| SMART Grants | Demonstrating projects utilizing innovative technology to improve transportation efficiency and safety. | $1 billion nationally |
| National Infrastructure Project Assistance grants program (Mega) | Highway or bridge project, including grade separation or elimination project. Supports large, complex projects that are difficult to fund through other means and that are likely to generate national or regional economic, mobility, or safety benefits. Minimum grant size of $100 million. It is possible to propose a program, or network, of projects that address same transportation challenge. | $5 billion nationally (2022–2026) |
| Nationally Significant Multimodal Freight and Highways Projects grants program (INFRA) | Multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas. Minimum project size of $100 million. A network of projects can be proposed that address same transportation problem. | $7.25 billion nationally (FY 2022–2026) |
| Healthy Streets Program | Projects that reduce the urban heat island and improve air quality. | $500 million |
| Bridge Investment Program | Bridge replacement, rehab, preservation, and protection. | $15.8 billion |
| Congestion Management & Air Quality (CMAQ) | Transportation projects or programs that contribute to attainment of national air quality standards. Must reduce air pollution and be included in the regional transportation plan. | Estimated $2.54 billion nationally in 2022, $506 million of which apportioned to California |
| Surface Transportation Block Grant (STBG) | Improve conditions and performance on any federal-aid highway, bridge, or tunnel projects on a public road; includes pedestrian and bicycle infrastructure. In general, funds aren't used on local roads, but there are many exceptions to this.[14] | $13.835 billion estimated nationally in 2022; $1.2 billion of which is apportioned to California Divided into population-based and statewide funds. |

14 https://www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm.

# PERFORMANCE MEASURES

Setting performance measures helps track progress toward goals and document the results of investments in biking, walking, and rolling. Performance measures and monitoring also helps to identify opportunities for improvement. Table 17 presents the performance measures and desired trends that have been established to track progress toward achieving this Plan's goals.

Table 17. Goals and Performance Measures

| GOAL | PERFORMANCE MEASURE AND DESIRED TREND |
|---|---|
| **Enhance Safety** | • Decrease vehicle travel speed measured at specific locations<br>• Decrease number of pedestrian and bicycle collisions<br>• Reduce severity of pedestrian and bicycle collisions<br>• Increase users' perception of safety<br>• Decrease average crossing distances |
| **Increase Walking and Biking** | • Increase walk/bike/roll to school mode share<br>• Increase walk/bike/roll to work mode share<br>• Increase walk/bike/roll to transit mode share<br>• Increase walk/bike/roll to recreational facilities |
| **Improve Connectivity** | • Reduce bicycle level of traffic stress<br>• Decrease number and length of sidewalk gaps<br>• Increase number of crossing opportunities<br>• Increase length of sidewalks that exceed minimum width requirements<br>• Increase the number of secure bike parking spaces |
| **Enhance Accessibility** | • Increase the number of traffic signals with audible cues<br>• Increase the number of intersections with directional curb ramps and detectable warning surfaces<br>• Decrease number and length of sidewalk gaps<br>• Increase length of sidewalks that exceed minimum width requirements<br>• Decrease length of sidewalks that are broken or in disrepair |
| **Prioritize Investments** | • Maintain and increase sustainable funding mechanisms and a dedicated funding source to build a complete streets network<br>• Maintain a maintenance plan for bicycle and pedestrian facilities<br>• Increase funding for bicycle and pedestrian projects as a percentage of total transportation infrastructure spending |

# LOOKING AHEAD

Walking and biking allow residents and visitors of Dublin to travel throughout the city in a way that promotes a sustainable, healthy, and vibrant community. This Plan helps foster a safe and connected multimodal transportation network and establishes Dublin's vision and comprehensive approach to improving walking, biking, and rolling.

The ultimate goal is a universally-accessible, safe, convenient, and integrated system that promotes active and sustainable transportation as a convenient alternative to motor vehicles. The Plan's performance measures allow for the ongoing tracking of progress towards implementation of the following goals:




The Plan provides for both near-term and long-term infrastructure investments to achieve the Plan's vision and goals as well as policy and programmatic recommendations that encourage and support walking, biking, and rolling. Together, these components create a comprehensive approach that will guide, prioritize, and implement a network of quality bicycle and pedestrian facilities to improve mobility, connectivity, and public health in Dublin.

# GLOSSARY

**2014 PLAN.** The 2014 Dublin Bicycle and Pedestrian Master Plan, which is being replaced by this plan.

**ACTIVE TRANSPORTATION.** Active transportation includes personal mobility devices of all kinds: bicycles, wheelchairs, scooters, rollerblades, skateboards, hoverboards, e-bikes, e-scooters, motorized wheelchairs, and more. Emerging technology and the availability of personal mobility devices complicate the definitions of bicycle and pedestrian. This Plan recognizes the high degree of overlapping policy, programmatic, and infrastructure needs among active modes and considers these a part of the bicycling and walking ecosystem. Where necessary, the Plan distinguishes electric mobility such as e-bikes and e-scooters to meet their unique requirements and needs.

**ARTERIALS:** Major roads that connect urbanized areas, cities, and industrial centers and generally have fewer direct access points.

**BICYCLE.** A bicycle (or bike) is a human-powered or motor-powered, pedal-driven vehicle with two wheels attached to a frame. Bicycles can be categorized in different ways, including by function, number of riders, general construction, gearing, or means of propulsion. The more common types include utility or commuter, mountain, road or racing, touring, hybrid, cruiser, BMX, and electric. Less common types include tandem, low-riders, tall bikes, fixed gear, folding, cargo, and recumbents. Unicycles, tricycles, and quadracycles are often referred to as bicycles though they are not strictly bicycles as they have fewer or more than two wheels.

**BICYCLE LEVEL OF TRAFFIC STRESS.** Bicycle level of traffic stress (LTS) is an analysis approach that quantifies the amount of comfort and level of stress that people feel when they bike on certain streets based on interactions with other travel modes, traffic control, and roadway characteristics. The methodology was developed in 2012 by the Mineta Transportation Institute and San Jose State University.

**BICYCLIST TYPOLOGY.** Bicyclist typology was developed in 2005 in Portland, Oregon to help understand how people used bicycles for transportation and what biking concerns and needs they had.[15] Based on this research, bicyclists tend to fall into one of four groups:

(1) **Strong and Fearless**—willing to bicycle with limited or no bicycle-specific infrastructure.

(2) **Enthused and Confident**—willing to bicycle if some bicycle-specific infrastructure is in place.

(3) **Interested but Concerned**—willing to bicycle if high-quality bicycle infrastructure is in place

(4) **No Way No How**—unwilling to bicycle even if high-quality bicycle infrastructure is in place

**COLLECTORS:** Major and minor streets and roads that connect local streets with arterials. Collectors are generally shorter and have lower speeds than arterials.

**COMPLETE STREET.** Complete Streets is an approach to planning, designing, building, operating, and maintaining streets that enables safe access for all people who need to use

15 Roger Geller, "Four Types of Cyclists," Portland Office of Transportation (2005), https://www.portlandoregon.gov/transportation/44597?a=237507.

them, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. https:/smartgrowthamerica.org/what-are-complete-streets/

**COMPLETE STREET STUDY.** A Complete Street Study is recommended on constrained corridors with multiple competing priorities where Class I or Class IV facilities were identified as the suitable facility to provide an all ages and abilities network. The Complete Street Study may include data collection, analysis, concept design development, and engagement and would be intended to evaluate conditions for people walking, biking, taking transit, and driving along the corridor and assist decision-makers and the public in selecting a preferred alternative for implementation.

**CURBSIDE MANAGEMENT.** An overarching management program and/or plan to guide allocation and regulation of the curbside for optimized mobility and safety for people using the curb space. Curb uses and users include: bicycle infrastructure, pedestrians and crossing infrastructure, vehicle storage, freight and passenger loading, parklets, food trucks and mobile vendors, among others.

**ELECTRIC BICYCLE.** An electric bicycle has fully operable pedals and an electric motor of less than 750 watts. According to Section 312.5 of the California Vehicle Code, there are three classifications of electric bicycles:

(1) **A Class 1 electric bicycle**, or low-speed pedal-assisted electric bicycle, has a motor that assists only when the rider is pedaling. That motor ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.

(2) **A Class 2 electric bicycl**e, or low-speed throttle-assisted electric bicycle, has a motor that can be used to propel the bicycle exclusively. The motor is not capable of assisting when the bicycle reaches the speed of 20 miles per hour.

(3) **A Class 3 electric bicycle**, or speed pedal-assisted electric bicycle, has a motor that assists only when the rider is pedaling. The motor stops assisting when the bicycle reaches the speed of 28 miles per hour. This class of electric bicycles is equipped with a speedometer.

**END-OF-TRIP FACILITIES.** Designated places—like secure bicycle parking, locker facilities, and changing rooms—that encourage bicyclists, joggers, and walkers to use sustainable modes to travel instead of driving.

**HIGH INJURY NETWORK.** The collection of worst-performing street segments based on severity and frequency of pedestrian and bicycle collisions.

**MICROMOBILITY.** Any small, low-speed, human or electric-powered transportation device, including bicycles, scooters, electric-assist bicycles (e-bikes), electric scooters (e-scooters), and other small, lightweight, wheeled conveyances.

**PEDESTRIAN.** People who travel by walking or jogging and people who use a mobility assistive device like walkers, canes, crutches, wheelchairs, or mobility scooters.

**PERSONAL MOBILITY DEVICE.** Various mechanical means of transportation including seated and standing traditional and electric scooters, skateboards, powered wheelchairs, bicycles, and Segways.

**ROLLING.** Rolling as a way to get around can mean many things, like bicycling, using a wheelchair, scooting, skateboarding, among other methods.

**SHY DISTANCE.** Shy distance refers to the space left between vehicles or pedestrians and bicyclists as they pass each other. The amount of shy distance required for safety tends to increase with speed.

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# APPENDIX

A. Community Engagement Summary

B. Existing Conditions

- a. Program and Policy Review
- b. Demographic Analysis
- c. Collision Analysis & High Injury Network
- d. Level of Traffic Stress Analysis
- e. Demand Analysis

C. Network Recommendations

- a. Prioritization Framework
- b. Project List
- c. Cost Estimates

D. Engineering & Design Guide

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# APPENDIX A

# COMMUNITY ENGAGEMENT SUMMARY: COMMUNITY ENGAGEMENT PLAN

Date: February 14th, 2020
Project: Dublin Bicycle and Pedestrian Master Plan
To: Sai Midididdi, Project Manager
From: Corinne Winter (Winter Consulting) through Mike Alston (Kittelson)

# FINAL Community Engagement Plan

## Introduction

The Community Engagement Plan (CEP) for the Dublin Bicycle and Pedestrian Master Plan Update (the Plan) establishes a framework for soliciting meaningful information and insights to inform decision making. Through the strategies outlined in the CEP, and in partnership with agency staff and community members, the Project Team will engage appropriate stakeholders to better understand walking and bicycling issues and opportunities within Dublin. This input will inform the development of bicycle and pedestrian projects, policies, and programs for the Plan update. The CEP includes the following sections:

1. Guiding Principles
2. Engagement Process
    a. Stakeholder Identification
    b. Engagement Strategy & Activities
    c. Documentation and Transition of Stakeholder Relationships

Appendices

1. Potential TAC Members
2. Potential Pop-Up Locations
3. Organizations

## 1. Guiding Principles

The strategies outlined in this CEP are guided by four principles:

- **Build on ongoing planning efforts:** The City of Dublin (City) has past experience working with community stakeholders. This CEP will build off of the City's prior and ongoing engagement efforts.

- **Coordinate outreach efforts:** In order to take full advantage of stakeholder input, the Project Team will fully coordinate various outreach activities with the project's technical tasks.

- **Build relationships with community-based organizations:** The Project Team will develop strategies to build and maintain strong relationships with Dublin and surrounding area community-based organizations (CBOs), and will identify opportunities to partner with community stakeholders on outreach implementation.

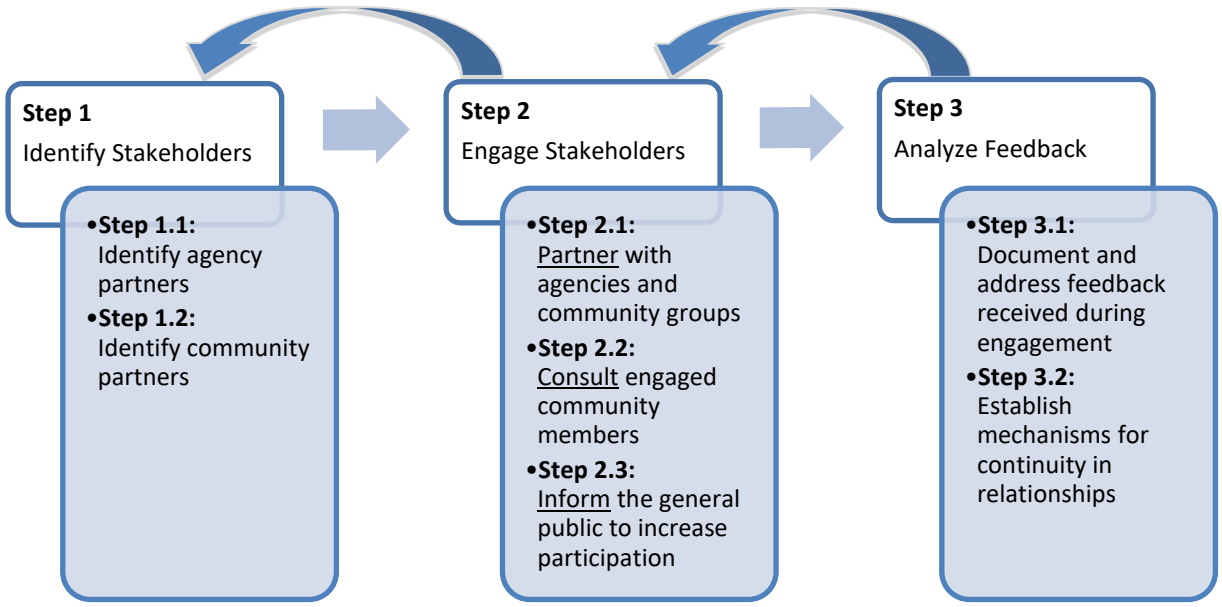
- **Engage stakeholders effectively and equitably**: The Project Team will work to ensure participation from a wide range of community members, including individuals from disadvantaged communities, of different ethnicities, and other community members who are traditionally underrepresented in outreach and engagement, including people with limited mobility. On-demand interpretation will be made available for all engagement activities to enable successful communication with all of Dublin's diverse residents.

## 2. Engagement Process

Community engagement for the Plan will include the following steps, as illustrated in **Figure 1**:

- Identify stakeholders
- Engage stakeholders
- Analyze feedback

**Figure 1: Stakeholder Engagement Process**




### *2.1 Stakeholder Identification*

The Project Team will identify stakeholders that may have an interest in shaping the outcomes of the Plan, including those that aren't yet aware the Plan is underway. These stakeholders generally fall into one of two categories:

- **Agency Partners:** Agencies responsible for project implementation, whether direct or indirect (e.g., agency departments, elected leaders)
- **Community Partners:** Community members who may be affected by or interested in changes to bicycle and pedestrian infrastructure, policies, and/or programs in Dublin

**Agency Partners**
Stakeholders include City of Dublin staff in Planning, Public Works, Parks, Community Services, and Dublin Police Services; Alameda County Fire Department; Dublin Unified School District; and elected/appointed representatives and other institutions (e.g., Kaiser Hospital), which influence transportation policy and project implementation.

**Community Partners**
The City's residents, businesses, bike shops (e.g., Dublin Cyclery), and groups such as Bike East Bay, Walk the Trail, and the Chamber of Commerce, will be interested in and impacted by the implementation of projects and policies defined in the Plan. Therefore, these community partners are an important group of stakeholders.

## *2.2 Engagement Strategy & Activities*

This section describes:

- The committees that will interface with the Project Team
- The activities that will be designed when consulting appropriate stakeholders at major decision-making points
- The communication plan used to keep the public informed and to increase participation in the activities described

### Governing Groups and Committees

The Project Team will form a Technical Advisory Committee (TAC) to provide key guidance. The Alameda CTC Bicycle and Pedestrian Advisory Committee (BPAC) serves as the Dublin's BPAC and will also provide important input.

1. **Technical Advisory Committee** (TAC)
    - **Members:** See **Appendix 1** for public agency representatives from various departments in Dublin
    - **Role:** The TAC will be consulted at five key project milestones and will be responsible for shaping the direction and outcomes of the Plan. Prior to TAC meetings, the Project Team will prepare meeting materials, and support the Project Manager in correspondence with TAC members. During TAC meetings, the Project Team will share relevant Plan information, review findings, discuss concerns and tradeoffs, and seek the TAC's guidance on Plan recommendations.
    - **Frequency:** See **Table 1** for a tentative meeting schedule, topics, and outcomes.
2. **Alameda CTC Bicycle and Pedestrian Advisory Committee** (BPAC)
    - **Members:** Current BPAC members
    - **Role:** Solicit input from the Alameda CTC Bicycle and Pedestrian Advisory Committee to provide additional guidance and support for the draft Plan.
    - **Frequency:** Introduce the Plan at the BPAC's April 30 meeting and then update BPAC throughout the Plan process as appropriate.

**Table 1: TAC Meeting Topics and Target Outcomes**

| Anticipated Date | Topics | Target Outcomes |
|---|---|---|
| **Meeting #1** March 2020 (Phase 1) | ▪ Introduce the Plan process<br>▪ Share the Community Engagement Plan<br>▪ Solicit input on the project vision | ▪ Establish collective understanding of the Plan and planning process<br>▪ Obtain feedback on Community Engagement Plan and upcoming stakeholder engagement<br>▪ Obtain input on project vision |
| **Meeting #2** May 2020 (Phase I) | ▪ Review and discuss preliminary existing conditions<br>▪ Update on community outreach<br>▪ Review draft vision and goals | ▪ Obtain feedback on draft existing conditions findings<br>▪ Obtain feedback on draft vision and goals |
| **Meeting #3** Fall 2020 (Phase 2) | ▪ Review preliminary findings from needs analysis<br>▪ Update on community outreach | ▪ Share findings from needs assessment<br>▪ Solicit input on recommendations for policy, program, and infrastructure elements |
| **Meeting #4** Winter 2021 | ▪ Draft prioritization approach and plan recommendations | ▪ Obtain feedback on draft prioritization approach and Plan recommendations |

| | | |
|---|---|---|
| (Phase 2) | | |
| **Meeting #5**<br>Spring 2021<br>(Phase 3) | ▪ Present draft Plan for review and comment | ▪ Obtain feedback on draft Plan |

## Community Engagement Activities

In addition to the ongoing partnerships described above, community engagement for the Plan includes activities to solicit input from the Dublin community on walking and biking, shown in **Table 2.** At key points in the technical work, the Consultant Team will summarize the feedback received from these engagement activities to incorporate into findings and recommendations. A wide range of community stakeholders will be consulted in the development of these activities to help:

- Identify potential gaps in the Project Team's understanding of existing conditions
- Obtain feedback on feasible alternatives from a broad spectrum of current and potential pedestrians and bicyclists
- Cultivate community support for future implementation

| Table 2: Outreach Activities During Each Plan Phase | | |
|---|---|---|
| **Phase** | **Activity** | **Purpose and Target Outcomes** |
| **Phase I: Project Launch (Feb – Oct 2020)** | One (1) workshop; City's bi-annual transportation community workshop | ▪ Inform the public about the Plan and gather broad community feedback<br>▪ Establish collective understanding of the planning process; Obtain feedback on project vision |
| | Two (2) pop-up events; potential locations are listed in Appendix 2 | ▪ Inform the public about the Plan and gather broad community feedback<br>▪ Assess qualitative priorities in various neighborhoods<br>▪ Meet residents at local events or meetings, and also advertise the events to the broader community |
| | Two (2) public meetings (e.g. City Council or Commissions) | ▪ Provide support to City staff and answer stakeholders' questions |
| | Distribute flyers/ postcards/business cards to various community locations | ▪ Spread information and interest in the Plan via Dublin's community facilities, library, trailheads, and through other City locations/programs<br>▪ Advertise interactive online map and other ways to provide input |
| | Website and online map | ▪ Will be updated at key project milestones and will provide information about the Plan development and events<br>▪ Online map will give the public the opportunity to identify desired improvements, gaps, and key destinations in the existing bicycle and pedestrian network |
| | Inform elected officials | ▪ Inform the City Council that the Plan is kicking off and invite them to sign up for future project emails, if interested |
| **Phase 2: Review of Draft Bicycle and Pedestrian Improvements (Nov 2020 through Apr 2021)** | Two (2) pop-up events; potential locations are listed in Appendix 2 | ▪ Inform the public about the Plan and gather broad community feedback on draft Plan elements<br>▪ Assess qualitative priorities in various neighborhoods<br>▪ Meet residents at local events or meetings, and also advertise the event to the broader community |
| | One (1) Walking Tour | ▪ Investigate existing conditions with Bike East Bay, Walk the Trail, and other community stakeholders<br>▪ Gather specific input on pedestrian and bicycle facilities, network gaps, and infrastructure needs |
| | Two (2) public meetings (e.g. City Council or Commissions) | ▪ Provide support to City staff and answer stakeholders' questions |
| | Website and online map and PUBLIC SURVEY | ▪ Project website will be updated at key project milestones and will provide information about the Plan development and events<br>▪ Online map will give the public the opportunity to review the proposed network/improvements and provide input |
| **Phase 3: Draft and Final Plan** | One (1) workshop; City's bi-annual Transportation Community Workshop | ▪ Gather broad community feedback<br>▪ Assess qualitative priorities across the City<br>▪ Obtain feedback on draft Plan elements |
| | Two (2) public meetings (e.g. City Council or Commissions) | ▪ Provide support to City staff and answer stakeholders' questions |
| | Website | ▪ Project website will be updated at key project milestones and will provide information about the Plan development and events |

## Plan Communications

Plan communication tools are summarized in **Table 3** and rely on electronic communication channels (i.e., City of Dublin, City PIO (Public Information Officer), and partner websites; social media accounts; stakeholder email lists; and Dublin Library and facilities). Content will be published concurrently with Plan milestones to keep the public up-to-date on the Plan's status, help identify additional stakeholders, and increase participation in the outreach activities described in **Table 2.**

The Consultant Team will also work with local community and business organizations to expand the reach of the Plan's communication channels. **Appendix 3** offers a preliminary list of stakeholder organizations.

**Table 3: Plan Communication Tools**

| Activity | Purpose | Occurrence | Target Outcomes |
|---|---|---|---|
| **Flyer/ Postcard/ Business Card** | Share Plan information with the public during Phase I | Develop an initial flyer at outset of Plan; distribute on two separate dates | ▪ Spread information and build interest in the Plan via Dublin's facilities; Library, trailhead message boards, and through other City locations (e.g., bike lockers at BART, bus shelters) |
| **Website** | Broadly share Plan materials and provide a platform for additional community participation | The website will be updated at key milestones | ▪ Document outreach meetings<br>▪ Link to/embed the online map<br>▪ Allow the public to provide feedback on the Draft Plan |
| **Social Media** | Broadly share Plan materials and encourage additional community participation using the City's existing platforms | As appropriate throughout the Plan | ▪ City to promote the Plan website, online map, in-person outreach events, and Plan milestones on existing City platforms |
| **Plan email list** | Keep interested parties informed about key milestones and outreach touch points | As appropriate throughout the Plan | ▪ Keep interested parties updated on Plan status and highlight opportunities to share feedback<br>▪ Help market outreach meetings and other feedback opportunities<br>▪ Help increase interest and engagement in outreach activities |
| **On-Demand Language Interpretation Service** | A phone-based service that provides interpretation in 244 languages | As appropriate throughout the Plan | ▪ Permits an increase in community stakeholders' participation in certain outreach activities described in **Table 2**<br>▪ Engage stakeholders effectively and equitably |
| **Partner-Organization Outreach** | Leverage partnerships with organizations interested in transportation to reach their constituencies | As appropriate throughout the Plan | ▪ Keep organizations' constituents updated on Plan status and highlight opportunities to share feedback<br>▪ Help market outreach meetings and other feedback opportunities<br>▪ Help increase interest and thus improve engagement in outreach activities |

## Online Engagement

This section describes the approach for the Plan website, social media communications, and online map.

### *Plan Website*

Online engagement tools will complement in-person outreach efforts. The Project Team will create a robust and customized online content management system (CMS) with significant capabilities and potential. This section

describes the initial framework for the CMS tool, but further customization is possible throughout the span of the planning process depending on project needs.

All aspects of the online tool will be fully accessible (compliant with the most stringent Federal accessibility standards) and will be easily utilized from both computers and various mobile devices. Optional demographic surveys will allow the project team to assess who is interacting with the online engagement tools and use this information to make decisions regarding in-person engagement (i.e., geographies or demographics that aren't represented can be further emphasized).

***Content for publication***

The CMS tool will provide a central storehouse for all general project information that might be of interest to stakeholders, for example:

- Project scope and timeline
- Agendas, minutes, and presentations from relevant meetings
- Connections to/from other relevant project websites
- Upcoming outreach events

***Content to encourage discourse***

In addition to providing static information, the CMS tool will be leveraged at multiple points during the planning process to solicit feedback from stakeholders and to share sophisticated project information. These mechanisms will include interactive online survey maps.

***Social media***

Social media engagement seeks to increase conversation around the project, reach target demographics that are outside currently engaged demographics, and successfully solicit feedback at various project stages.

***Mechanisms for advertising the online assets***

Regardless of how robust they are, online engagement platforms are only as useful as the amount of traffic that they receive and who they are able to reach. Recognizing the importance of driving traffic to the web assets, the Project Team will develop multiple channels to advertise the project website and tools, including the City and partners' email distribution lists, social media, project collateral, and in-person outreach.

## *2.3 Documentation and Transition of Stakeholder Relationships*

This aspect of the engagement process focuses on documenting the outreach efforts as well as ensuring continuity between planning and implementation.

The Consultant Team will establish mechanisms for continuity in stakeholder relationships by providing the stakeholder database to the City and making all online assets made available to City for future use. The Team will indicate if follow-up with specific demographics or individuals may be recommended.

Documentation will include activity summaries for each of the three outreach phases as well as a summary outreach report. The Consultant Team will transfer all engagement materials and files to the City for future use or reference. All outreach efforts will be documented and summarized in a summary outreach report, which will be folded into the final Dublin Bicycle and Pedestrian Master Plan.

## *Appendix 1: Potential TAC Members*

| Contact | Email | Designation | Agency/Department | Confirmed |
|---|---|---|---|---|
| **Kristie Wheeler** | Kristie.Wheeler@dublin.ca.gov | Assistant Community Development Director | Planning | Yes |
| **Bridget Amaya** | Bridget.Amaya@dublin.ca.gov | Assistant Parks & Community Services Director | Parks & Community Service | Yes |
| **Chris Stevens** | stevenschris@dublinusd.org | Chief Facilities Operations Officer; Office 925-828-2551 ext. 8061, Cell 925-557-0109 | Dublin Unified School District | Verbal ok/No email confirmation yet |
| **Kevin Monaghan** | Kevin.Monaghan@dublin.ca.gov | Traffic Sergeant | Dublin Police Department | Yes |
| **Darrell Jones** | Darrell.Jones@dublin.ca.gov | Deputy Fire Marshall | Dublin Fire Department | Yes |
| **Lisa Bobadilla** | lbobadilla@sanramon.ca.gov | Division Manager, Transportation Division, Public Works | City of San Ramon | Yes |
| **Cedric Novenario** | cnovenario@cityofpleasantonca.gov | Senior Traffic Engineer | City of Pleasanton | Yes |
| **Julie Chiu** | jchiu@cityoflivermore.net | Associate Civil Engineer | City of Livermore | Yes-Include both |
| **Andy Ross** | aaross@cityoflivermore.net | Assistant Planner | City of Livermore | Yes-Include both |
| **Hazel Wetherford** | Hazel.Wetherford@dublin.ca.gov | Economic Development Director | City Manager's Office | Yes |
| **John Stefanski** | John.Stefanski@dublin.ca.gov | Assistant to the City Manager | City Manager's Office | Yes |
| **Christopher Marks** | CMarks@alamedactc.org | Associate Transportation Planner | Alameda CTC | Yes |
| **Sergio Ruiz** | sergio.ruiz@dot.ca.gov | Branch Chief for Active Transportation | Caltrans | Yes |
| **Jake Freedman** | Jake.Freedman@dot.ca.gov | East Alameda County liaison | Caltrans | Yes |
| **Mariana Parreiras** | mparrei@bart.gov | Project Manager, BART Planning, Development & Construction, 510.464.6169 | BART | Emailed the contact- Not confirmed yet |
| **Cyrus Sheik** | csheik@lavta.org | | LAVTA | Yes |

## *Appendix 2: Potential Pop-Up Locations*

| Event | Date | Phase | Location |
|---|---|---|---|
| **Shamrock 5k Fun Run & Walk** | Sunday, March 15, at 8:30 a.m. | Phase 1 | Dublin |
| **Saint Patrick's Day Festival** | Saturday, March 14 & Sunday, March 15 | Phase 1 | 100 Civic Plaza, Dublin, CA |
| **Bike East Bay – Family Cycling Workshops** | Saturday, March 28, 2020 \|10 a.m. – 1 p.m. | Phase 1 | 2100 E Cantara Drive |
| **Dublin Farmers' Market** | Thursdays, beginning April 2, 4:00 p.m. – 8:00 p.m.<br><br>Thursday, May 28 – Bike to Market Day | Phase 1 or 2 | Emerald Glen Community Park, Dublin, CA |
| **Dublin Pride Volunteer Day** | Saturday, April 25 8 a.m. -1 p.m. | Phase 1 | Emerald Glen Park, Gleason Dr., Dublin |

| | | | |
|---|---|---|---|
| **Cinderella Ride 2020** | Saturday, March 28, 2020 | Phase 1 | Las Positas College – Livermore, CA |
| **Dublin Pride Week Workshops** | Saturday April 25 - May 3 | Phase 1 | Various locations throughout Dublin |
| **Bike Commuting 101** | Thursday, April 30 | Phase 1 | 100 Civic Plaza, Dublin, CA |
| **Bike to Work Day** | Thursday, May 14, 2020 | Phase 1 | East and West Dublin BART, Dublin, CA |
| **Community Bike Ride** | May 16, 2020 | Phase 1 | 11-mile ride between City of Pleasanton and City of Dublin |
| **Spring Eggstravaganza** | Saturday, April 11, 2020 \| 8:30 a.m. – 1:00 p.m. | Phase 1 | 4201 Central Parkway |
| **Picnic Flix** | Fri, June 12 \| Fri, July 31\| Fri, Aug 21 | Phase 1 | 4201 Central Parkway |
| **Family Campout** | June 20-21, 3:00 p.m. – 10:00 a.m.<br>July 11-12, 3:00 p.m. – 10:00 a.m.<br>August 8-9, 3:00 p.m. – 10:00 a.m. | Phase 1 | Emerald Glen Park<br>Alamo Creek Park<br>Schaefer Ranch Park |
| **Dublin Heritage Park and Museums** | Music Jams & Hands-On History Day | Phase 1 | 6600 Donlon Way, Dublin, CA |
| **Splatter** | September 12 | Phase 1 | Emerald Glen Park, 4201 Central Parkway, Dublin, CA |
| **Walk and Roll to School** | First week of October, planning meetings with schools in Sept. Could promote plan @ meeting and ask site leads to distribute info or host workshop @ school | Phase 2 | |
| **Homecoming Parade** | TBD | Phase 2 | Dublin High School |
| **Dublin Senior Center Info. Fair** | October 3, 2020 | Phase 2 | |
| **The Wave** | Swim lessons, swim meets, etc. | Phase 2 | |
| **Dublin Library** | Tabling at entrance during peak use | Phase 2 | |

## *Appendix 3: Stakeholder Organizations*

| Organization | Website | Number & Email |
|---|---|---|
| WHEELS | https://www.wheelsbus.com/ | 925-828-0231<br>info@lavta.org |
| Dial-a-Ride | https://www.wheelsbus.com/ | 925-455-7510<br>info@lavta.org |
| Bike East Bay | https://bikeeastbay.org/ | kristi@bikeeastbay.org |
| The Trail Group | | |
| Valley Spokesmen Bicycle Club | https://www.valleyspokesmen.org | 925-828-5299<br>webmaster@valleyspokesmen.org |
| Indians in Dublin, Ca | Facebook Link | |
| Asian Pacific Islander American Public Affairs | https://www.apapa.org | 916-928-9988<br>info@apapa.org |
| Integrity in Action | Dublin-integrity-in-action.org | info@dublinintegrityinaction.org |
| Chamber of Commerce | www.dublinchamberofcommerce.org | 925-828-6200, Inge Houston, CEO/President, ceo@dublinchamberofcommerce.org |
| Innovation Tri-Valley | | Lynn Naylor, CEO, lnaylor@innovationtrivalley.org |
| Dublin Senior Foundation | | 925-833-1866 |
| Dublin Community Foundation | http://www.dublinfoundation.org/ | 614-889-2001 |

| | | |
|---|---|---|
| New Life Church | www.newlifeinfo.com | 925-355-9200 |
| Muslim Community Center | https://mcceastbay.org/ | 925-485-1786<br>contact@mcceastbay.org |
| Valley Christian Center | www.comediscovervcc.org | 925-560-6202 |
| Blazing Fire Church | https://blazingfire.org/home | 925-264-9161<br>info@blazingfire.org |
| Dublin Art Collective | Facebook.com/DublinArtCa | |
| Sri Panchamukha Hanuman Temple | https://panchamukhahanuman.org/ | 510-926-7638<br>pmhtemple@gmail.com |
| Dublin Fighting Irish | http://www.dublinfightingirish.org | 510-714-1439<br>irishyouthfootball@yahoo.com |
| Tri-Valley Convention and Visitor's Bureau | | 925-846-8910 |
| Tri-Valley YMCA | | 925-263-4444 |
| Women's Club of Dublin/San Ramon | https://dsrwomensclub.org/ | 925-828-0231<br>dsrwcmail@gmail.com |
| Dublin Sister City Association | Facebook Link | 925-899-4771 |
| Dublin Partners in Education | www.dpie.org | 925-828-2551 x8024 |
| Dublin Lions Club | | 925-828-6636<br>steve6gd@yahoo.com |
| Girl Scouts | https://www.crossroadsgirlscouts.com/ | 800-447-4475<br>crossroadsgirlscouts@gmail.com |
| Boy Scouts of America | http://www.sfbac.org/about/ebscoutshop | 925-785-4518<br>jalewis@bsamail.org |
| Dublin Historical Preservation Association | http://dhpa.org/ | dhpaorg@gmail.com |
| Dublin 4-H | https://www.dublin4h.com/ | 925-462-4518<br>cnattu@gmail.com<br>badami@gmail.com |
| Child Care Links | https://behively.org/ | 925-417-8733<br>hello@behively.org |
| BART | | Kamala Parks, KParks2@bart.gov |
| Senior Support Programs of the Tri-Valley | | |
| Alameda County Safe Routes to School | http://alamedacountysr2s.org/ | info@alamedacountysr2s.org |
| Kaiser Permanente | | Ronald Wetter, Community & Governmental Relations Manager, ronald.wetter@kp.org |
| Zeiss Meditec | | Mark Boyd, Sr. Facilities Manager, mar.boyd@zeiss.com |
| Vagaro HQ | | Kerry Melchoir, Director of Operations, kerrymelchior@vagaro.com |
| TriNet HQ | | Jay Meyer, Director of Facilities, jay.meyer@trinet.com |
| Patelco Credit Union HQ | | Cara Houck, Community and Corporate Social Responsibility Specialist, chouck@patelco.org |
| AEye HQ | | Jennifer Deitsch, Communications Director |
| Ross Stores HQ | | Lynn Mayate, Corporate HR, lynn.mayate@ros.com |
| Graybar | | Kristian Reyes, Kristian.Reyes@grybar.com |

| | | |
|---|---|---|
| Chabot Las Positas Community College District | | Julia Dozier, District Executive Director, jdozier@clpccd.org |
| Dublin San Ramon Services District | | Judy Zavadil, zavadil@dsrsd.com |
| Camp Parks | | Brian Lucid, Analyst, brian.m.lucid.civ@mail.mil |
| Tri-Valley Career Center | | Sarah Holtzclaw, Program Manager, sholtzclaw@clpccd.org |
| Federal Corrections Institute | | |
| Alameda County (Courthouse, Office of Emergency Services, County Jail) | | |

# APPENDIX A

# COMMUNITY ENGAGEMENT SUMMARY: PROJECT FACTSHEET

DUBLIN
CALIFORNIA

# BICYCLE AND PEDESTRIAN MASTER PLAN

**Please fill out our Public Survey!**

## OUR VISION

The City of Dublin is a vibrant place where walking and biking are **safe, comfortable,** and **convenient** ways to travel and connect individuals, **inclusive of all ages and abilities,** to local and regional destinations.

## GOALS

**Enhance Safety** Prioritize safety in design and implementation of walking and biking facilities.

**Increase Walking and Biking** Support biking and walking as attractive modes of transportation.

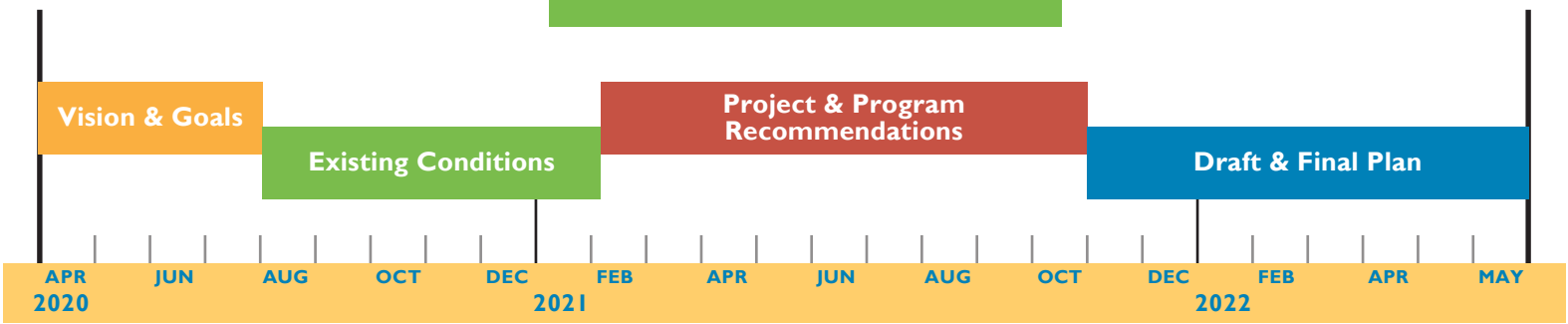
**Improve Connectivity** Develop a bicycle and pedestrian network that provides well-connected facilities for users of all ages and abilities.

**Enhance Accessibility** Utilize principles of universal design to make biking and walking a viable transportation option for all, including people with disabilities.

## GET INVOLVED

**Go to www.dublinbikeped.org to learn more and provide input to inform the Bicycle and Pedestrian Master Plan.**

**Prioritize Investments** Maintain sufficient funding to provide for existing and future bicycle and pedestrian needs, including supporting programs and operation and maintenance. Leverage biking and walking projects to promote economic activity and social equity outcomes among people of all ages and abilities




**City of Dublin**
100 Civic Plaza, Dublin, CA 94568
(925) 833-6630 | (925) 833-6651 FAX
www.dublin.ca.gov

**Email us at:**
bikeandpedplan@dublin.ca.gov

# APPENDIX A

# COMMUNITY ENGAGEMENT SUMMARY: PUBLIC SURVEY

DUBLIN CALIFORNIA

City of Dublin's Bicycle and Pedestrian Plan update

# Transportation Survey

**The City of Dublin is updating its Bicycle and Pedestrian** Plan to further the Dublin's commitment to create a walk- and bike-friendly community. The Plan will include goals and recommendations to ensure that walking and biking in Dublin is safe, comfortable, and fun for all ages and abilities.

**This survey is intended to better understand travel behavior of residents** who walk and bike in Dublin. This data will be used to inform the program, policy, and project recommendations. This survey will take approximately 7 minutes to complete, and the information collected will be confidential and used solely to inform the City's Bicycle and Pedestrian Plan update.

**To learn more about the City of Dublin's Bicycle and Pedestrian Plan update**, please visit the project website: www.DublinBikePed.org.

The more survey responses we get, the better informed our Plan will be. *Please share this survey with your friends, colleagues, family, and neighbors!*

## General Travel Habits

1. **Before the COVID-19 pandemic, how frequently did you use each of the following options to travel to work or school? Check the appropriate boxes.**

| | Never | Less than once a month | 1-3 days a month | At least once a week |
|---|---|---|---|---|
| Drive alone in personal car, truck, van, or motorcycle | ❑ | ❑ | ❑ | ❑ |
| Carpool with others (car or van) | ❑ | ❑ | ❑ | ❑ |
| Public transit (Bus, BART) | ❑ | ❑ | ❑ | ❑ |
| Paratransit | ❑ | ❑ | ❑ | ❑ |
| Employer-provided shuttle | ❑ | ❑ | ❑ | ❑ |
| Personal Bicycle | ❑ | ❑ | ❑ | ❑ |
| Bike share | ❑ | ❑ | ❑ | ❑ |
| Scooter share/personal scooter | ❑ | ❑ | ❑ | ❑ |
| Walk | ❑ | ❑ | ❑ | ❑ |
| Taxi (Includes Uber, Lyft etc.) | ❑ | ❑ | ❑ | ❑ |
| Use wheelchair/mobility aid | ❑ | ❑ | ❑ | ❑ |
| Combination of multiple travel modes (bike to a transit station, drive to a vanpool location, etc.) | ❑ | ❑ | ❑ | ❑ |

2. **After the COVID-19 pandemic, how frequently will you use each of the following options to travel to work or school? Check the appropriate boxes.**

| | Never | Less than once a month | 1-3 days a month | At least once a week |
|---|---|---|---|---|
| Drive alone in personal car, truck, van, or motorcycle | ❑ | ❑ | ❑ | ❑ |
| Carpool with others (car or van) | ❑ | ❑ | ❑ | ❑ |
| Public transit (Bus, BART) | ❑ | ❑ | ❑ | ❑ |
| Paratransit | ❑ | ❑ | ❑ | ❑ |
| Employer-provided shuttle | ❑ | ❑ | ❑ | ❑ |
| Personal Bicycle | ❑ | ❑ | ❑ | ❑ |
| Bike share | ❑ | ❑ | ❑ | ❑ |
| Scooter share/personal scooter | ❑ | ❑ | ❑ | ❑ |
| Walk | ❑ | ❑ | ❑ | ❑ |
| Taxi (Includes Uber, Lyft etc.) | ❑ | ❑ | ❑ | ❑ |
| Use wheelchair/mobility aid | ❑ | ❑ | ❑ | ❑ |
| Combination of multiple travel modes (bike to a transit station, drive to a vanpool location, etc.) | ❑ | ❑ | ❑ | ❑ |

3. **On Question 1, if you selected "Combination of multiple travel modes," what travel modes are involved in your trip? Check all that apply.**

- ❑ Personal vehicle (drive alone)
- ❑ Carpool / Vanpool
- ❑ Public Transit
- ❑ Paratransit
- ❑ Employer-provided shuttle
- ❑ Personal Bicycle
- ❑ Bike share
- ❑ Scooter share/personal scooter
- ❑ Walk
- ❑ Use a wheelchair/mobility aid
- ❑ Taxi (Includes Uber, Lyft, etc.)
- ❑ Other: _____

**4. If you most often drive alone to work, which of the following are the main reasons?**
**Check all that apply.**

- ❑ Don't usually drive alone to get to work
- ❑ Driving alone is quickest/most convenient option
- ❑ Privacy
- ❑ Safety
- ❑ Cost of other transportation options is prohibitive
- ❑ Irregular work schedule
- ❑ Need to make additional stops on the way to or from work, or in the middle of the day
- ❑ Work reasons/commitments
- ❑ Don't have access to or want to take a shower at work if I walk or bike
- ❑ Too hard to get to transit stop/station from home
- ❑ Too hard to get to transit stop/station from work
- ❑ Public transportation or paratransit are not available or convenient
- ❑ Sidewalks are not traversable while using a wheelchair or mobility aid
- ❑ The route I would use does not have curb ramps
- ❑ Tactile warning surfaces (such as yellow truncated domes) are either confusing or not present
- ❑ Weather
- ❑ Insufficient bike parking
- ❑ Other, please specify:

_____

**5. Do you have school-aged children?**

- ❑ Yes
- ❑ No
- ❑ Prefer not to answer

**6. If you have children, how do your child(ren) typically travel to/from school? (Check all that apply.)**

- ❑ Walk
- ❑ Dropped off in a personal vehicle
- ❑ School bus
- ❑ Public transportation (bus/rail)
- ❑ Paratransit, wheelchair or mobility aid
- ❑ Bike
- ❑ Scooter
- ❑ Drive themselves alone or with siblings
- ❑ Other:

_____

**7. If you have children, please indicate which, if any, of the following factors <u>discourage</u> your child(ren) from traveling to/from school by biking, using a scooter, walking or using a wheelchair/mobility aid. (Check all that apply.)**

- ❑ Takes too long / distance to school
- ❑ Inconvenient
- ❑ Not safe from traffic
- ❑ Not safe from crime
- ❑ It isn't "cool"/peer pressure
- ❑ Lack of bicycle facilities
- ❑ Lack of sidewalks
- ❑ Lack of curb ramps
- ❑ Tactile warning surfaces (such as yellow truncated domes) between sidewalk and street are either confusing or not present
- ❑ Sidewalks in poor condition (cracks, uneven surface, etc.) or obstacles on the sidewalk (light poles, trees, etc.)
- ❑ Insufficient bike parking
- ❑ Other:

_____

## Walking and Biking in Dublin

**8. How important are the following potential barriers when considering whether to bike, walk or travel using a wheelchair/mobility aid somewhere, like to work or to run errands?**

| | Not important | Somewhat important | Very important |
|---|---|---|---|
| Cars go too fast and/or are too close to the sidewalk | ❑ | ❑ | ❑ |
| The existing sidewalks, bicycle facilities, and trails are not maintained properly | ❑ | ❑ | ❑ |
| Existing sidewalks, bicycle facilities and trails do not provide safe access for my wheelchair or mobility aid | ❑ | ❑ | ❑ |
| There isn't enough lighting in the areas where I would walk or bike | ❑ | ❑ | ❑ |
| Crossing the street feels dangerous | ❑ | ❑ | ❑ |
| It is inconvenient to get to close-by destinations (grocery stores, jobs, schools, parks, transit stations) | ❑ | ❑ | ❑ |
| There is not enough shade to keep me comfortable on the walk or bike/scooter ride | ❑ | ❑ | ❑ |
| Are we missing anything important? Please write in comment box | | | |

**9. What is your favorite street to bike, walk or travel on using a wheelchair or mobility aid in Dublin, and why?**

_____

_____

_____

**10. What types of improvements would encourage you travel more in Dublin by biking, walking or by wheelchair/mobility aid?**
**Select up to three.**

- ❑ Better/more bicycle facilities
- ❑ Better/more sidewalks and trails
- ❑ Lower vehicle speeds and/or more traffic calming infrastructure (ex. Curb extensions, etc.)
- ❑ More pedestrian countdown signals and pedestrian hybrid beacons at intersections
- ❑ Improved street lighting
- ❑ More marked crosswalks at intersections and/or in the middle of the block
- ❑ Better maintenance of existing sidewalks, bicycle facilities, and paths
- ❑ Employer incentives to walk or bike to work
- ❑ Better sidewalk, bicycle facility, and trail connections to transit stops/stations
- ❑ More trees, shade, benches or other amenities along my route
- ❑ More curb ramps and audible pedestrian push buttons
- ❑ Additional short- and long-term secure bike parking for all types of bicycles
- ❑ Additional onboard bike parking on transit
- ❑ Other:

_____

**11. Where should the City prioritize walking improvements first? Select up to three.**

- ❑ Places where pedestrians are involved in traffic crashes
- ❑ On routes connecting people to schools, libraries, and parks
- ❑ On routes connecting people to transit stops
- ❑ To serve people who rely on walking the most (such as those who have limited access to vehicles or transit)
- ❑ Along and across busy streets
- ❑ On streets connecting to businesses
- ❑ In areas with the most people walking
- ❑ Other: _____

**12. Where should the City prioritize biking improvements first? Select up to three.**

- ❑ Places where bicyclists are involved in traffic crashes
- ❑ On routes connecting people to schools, libraries, and parks
- ❑ On routes connecting people to transit stops
- ❑ To serve people who rely on biking the most (such as those who have limited access to vehicles or transit)
- ❑ At trail intersections
- ❑ Along and across busy streets
- ❑ On streets connecting to businesses
- ❑ In areas with the most people biking
- ❑ Other _____

Is there anything else you'd like to tell us about biking, walking or using a wheelchair/mobility aid in Dublin?

_____

_____

_____

_____

## About You

*The following questions will help City staff ensure that people throughout Dublin and from different backgrounds are participating in this process. Remember that your responses to the survey questions are completely anonymous.*

**13. What are the cross streets nearest to your home address? (Enter as you would in Google Maps…example response: "Dublin Boulevard and Regional Street, Dublin, CA")?**

_____

_____

_____

**14. Your age**

- ❑ 5-14 years old
- ❑ 15-24 years old
- ❑ 25-44 years old
- ❑ 45-64 years old
- ❑ 65+ years old
- ❑ Prefer not to respond

**15. Other than yourself, are any members of your household: (Check all that apply.)**

- ❑ Under age 18
- ❑ Over age 65
- ❑ Not applicable
- ❑ Prefer not to respond

**16. What is your gender identity?**

- ❑ Female
- ❑ Male
- ❑ Gender non-conforming (Please specify): _____
- ❑ Prefer not to respond

**17. How do you identify your race/ethnicity? (Select all that apply.)**

- ❑ White
- ❑ Black or African American
- ❑ American Indian or Alaska Native
- ❑ Chinese
- ❑ Filipino
- ❑ Asian Indian
- ❑ Vietnamese
- ❑ Korean
- ❑ Japanese
- ❑ Other Asian
- ❑ Native Hawaiian
- ❑ Samoan
- ❑ Chamorro
- ❑ Other Pacific Islander
- ❑ Other
- ❑ Prefer not to respond

**18. Do you have a motor vehicle available for your use?**

- ❑ Yes
- ❑ No

_____

## Thank You!

**19. Thank you for participating in this survey! The information you provided is an important part of developing the City of Dublin Bicycle and Pedestrian Plan Update.**

**20. Do you have suggestions about issues or improvements to specific locations in Dublin? If so, we encourage you to also submit comments using the project's online interactive map, accessible at www.DublinBikePed.org**

# APPENDIX B

# EXISTING CONDITIONS: PROGRAM & POLICY REVIEW

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# MEMORANDUM

**Dublin Bicycle and Pedestrian Plan**

Inventory of Existing Programs and Policies

| | | |
|---|---|---|
| Date: | June 5, 2020 | Project #: 24392 |
| To: | Sai Midididdi, TE | |
| From: | Quinn Wallace; Erin Ferguson, PE, RSP; Amanda Leahy, AICP | |
| Subject: | Dublin Bicycle and Pedestrian Plan – Inventory of Existing Programs and Policies | |

The City of Dublin (City) is updating the 2014 Dublin Bicycle and Pedestrian Master Plan (2014 Plan). The Dublin Bicycle and Pedestrian Master Plan Update (Plan) will serve as a comprehensive action plan for the City to provide improved bicycle and pedestrian facilities for its residents, employees, and visitors. As part of the baseline conditions and needs assessment, Kittelson & Associates, Inc. (Kittelson) is inventorying existing programs and policies related to walking and biking. This memorandum (memo) details this inventory and key themes from interviews conducted with representatives of seven City departments and the Dublin Unified School District. The memo is organized into the following sections:

- Document Review Summary
- Benchmarking Interviews Summary
- Programs Overview
- Key Needs and Recommendations
- Appendix: Interview Questionnaires

## DOCUMENT REVIEW SUMMARY

This section summarizes current and draft policies and planning documents that are the most relevant to this Plan. Documents shown in

Table 1 were reviewed and summarized in this section with the intent to guide the active transportation goals, policies, and projects presented in this Plan. In addition to the documents identified in Table 1, the Plan will coordinate with upcoming efforts, including the Local Roadway Safety Plan and ADA Transition Plan. Following Table 1, each plan is described in greater detail and organized by scale chronologically.

**Table 1: Relationship to Approved and Ongoing Plans**

| Plan | | Bicycle Policies | Pedestrian Policies | Facility/ Network Maps | Design Guidelines | Design Concepts | Program Recommendations |
|---|---|---|---|---|---|---|---|
| *State and Regional Plans* | | | | | | | |
| California Green Building Code | | ● | | | | | |
| Countywide Active Transportation Plan (2019) | | ● | ● | | | | |
| Caltrans District 4 Bike Plan | | ● | | ● | | | |
| *Local Plans* | | | | | | | |
| Streetscape Master Plan (2009) | | | | | ● | | |
| Complete Streets Policy (City Council Resolution 199-12) (2012) | | ● | ● | | | | |
| Dublin Boulevard Bikeway Corridor and Connectivity Studies (2013) | | ● | | | | ● | |
| Pedestrian Safety Assessment (2014) | | | | | | | ● |
| Bicycle and Pedestrian Master Plan (2014) | | ● | ● | ● | ● | ● | ● |
| General Plan Land Use & Circulation (2014) | Circulation & Scenic Highways Element | ● | ● | | | | |
| | Schools, Public Lands, & Utilities Element | ● | ● | | | | |
| Parks and Recreation Master Plan (2015) | | | | | ● | | |

| Plan | | Bicycle Policies | Pedestrian Policies | Facility/ Network Maps | Design Guidelines | Design Concepts | Program Recommendations |
|---|---|---|---|---|---|---|---|
| Iron Horse Regional Trail Feasibility Study (2017) | | | | | | ● | |
| Traffic Safety Study Update (2018) | | | | | | ● | |
| Climate Action Plan (2020) | | ● | ● | | | | ● |
| Downtown Streetscape Master Plan (2020) | | | | ● | ● | ● | |
| Local Road Safety Plan (in progress) | | | | ● | ● | ● | ● |
| ADA Transition Plan (in progress) | | | | ● | | | ● |
| Specific Plans | Dublin Crossing (2013) | | | ● | ● | ● | |
| | Downtown (2014) | | | | ● | ● | |
| | Dublin Village Historic Area (2014) | | | ● | | | |
| | Eastern Dublin (2016) | ● | ● | | | ● | |

Source: Kittelson & Associates, Inc. 2020.

## State and Regional Plans

State and regional plans pertinent to the Plan are summarized in this section. A summary of additional state and regional plans are included in the existing Bicycle and Pedestrian Master Plan.

### *California Green Building Standards Code*

According to Chapter 8.76 of the City of Dublin's Municipal Code, bicycle parking and support facilities in both residential and non-residential development shall conform to the California Green Building Standards Code (CALGreen). The CALGreen Code includes both mandatory and voluntary measures.

For non-residential buildings, it is mandatory that both short-term and long-term bicycle parking is provided and secure. Generally, the number of long-term bicycle parking spaces must be at least 5% of the number of vehicle parking spaces. Schools have additional requirements so that both students and staff have access to sufficient bicycle parking.

### *Countywide Bicycle and Pedestrian Plans (2012)*

The Alameda Countywide Bicycle and Pedestrian Plans established policies at the county level to augment regional and local bicycle and pedestrian plans, programs, and goals. Following a wave of legislative and regulatory changes intended to link transportation and land use planning (such as AB 32), the plans envisioned a transportation system that is multimodal, safe, accessible, affordable, and equitable, integrated, and more. In 2012, a total of $390 million (7% of total program funding) was dedicated to bicycle and pedestrian projects throughout the County. Two active transportation projects were identified in Dublin: the Alamo Canal Trail under I-580 and Gap Closure and Development of the Iron Horse Trail.

### *Countywide Active Transportation Plan (2019)*

The 2019 Countywide Active Transportation Plan (CATP) combines updates of the Countywide Bicycle Plan and Countywide Pedestrian Plan. The CATP includes an analysis of low stress bike networks, identifies a countywide high injury pedestrian and bicycle network, evaluates major barriers to the bicycle and pedestrian network, and establishes a framework for prioritizing projects of countywide significance to inform decision-making around active transportation funding at Alameda County Transportation Commission. At the local level, the CATP provides resources to member agencies to help advance projects that provide complete, safe, and connected networks for biking and walking, including better connections to the regional transit network. Connectivity analysis presented in the CATP indicate that the East planning area, which includes the City of Dublin, generally has poor low-stress connectivity in the rural and outlying suburban areas, and the business park portions of Dublin and Pleasanton. Based on the high injury network analysis completed in the CATP, the combined bicycle and pedestrian high injury network mileage represents less than one percent of total countywide high injury network mileage. Within the East planning area, Dublin Boulevard from Arnold Drive to Hacienda Drive and Village Parkway from Davona Drive to Tamarack Drive experience the highest bicycle collision severity score and Dublin Boulevard was identified as the street with the most mileage on the pedestrian high injury network.

### *Caltrans District 4 Bike Plan*

The Caltrans District 4 Bike Plan evaluates bicycle needs on and across the State transportation network and identifies priority bicycle projects. Projects are classified by prioritization categories of top tier, mid tier, and low tier. The following projects are recommended for Dublin:

- Top Tier Project:

    - Santa Rita Road and I-580: Interchange reconstruction (ramps only), Class IIB facility
- Mid Tier Project:
    - Tassajara Creek and I-580: New separated crossing
    - Alcosta Boulevard and I-680: Minor interchange improvements (signage and striping), Class II facility
- Low Tier Project:

## Demarcus Boulevard and I-580: New separated crossingLocal Plans

Existing and draft plans with relevant plans, policies, and goals are described in this section of the non-infrastructure inventory.

### *Streetscape Master Plan (2009)*

This Master Plan maximizes opportunities to craft an urban image unique to Dublin and to maintain existing amenities like street trees. Goals of the Streetscape Master Plan range from coordinating improvements and responsibilities for Dublin's streets to strengthening the streetscape design of Dublin Boulevard. In the context of active transportation, the Streetscape Master Plan is a particularly valuable resource for identifying and implementing street improvements that contribute to Dublin's image.

### *Complete Streets Policy (City Council Resolution 199-12) (2012)*

The City of Dublin's Complete Streets Policy identifies complete streets planning as a critical contributor to:

- Increase walking, biking, and taking transit,
- Reduce vehicle miles traveled (VMT), and
- Meet greenhouse gas reduction goals.

Together, these targets are intended to result in public health benefits. The Policy emphasizes community engagement to remain sensitive to land use and context and coordination with nearby jurisdictions to connect infrastructure across city boundaries. The Policy names several improvements that should be considered to benefit all users of the street, including sidewalks, shared use paths, bike lanes and routes, accessible curb ramps, and more.

### *Dublin Boulevard Bikeway Corridor and Connectivity Studies (2013)*

Two studies completed in 2013 that evaluated options for improving bicycling conditions on Dublin Boulevard, particularly in Downtown Dublin. A traffic analysis determined that removing a vehicle travel lane on Dublin Boulevard would delay transit service and worsen traffic during peak periods. Community members and local business owners expressed concern for this potential barrier to visiting Downtown Dublin via car. Ultimately, a shared-use path running alongside Dublin Boulevard and

connecting to the Alamo Canal Trail became the long-term vision for bicycling. In the interim, sharrows (a Class III facility) were added to Dublin Boulevard between Dublin Court and Tassajara Road, and the City permitted riding bicycles on sidewalks to make riding a more comfortable experience for all bicyclists' skill levels.

### *Pedestrian Safety Assessment (2014)*

The UC Berkeley Institute of Transportation Studies Technology Transfer Program prepared this Assessment for the City of Dublin in 2014. The authors compared different types of collisions that occurred in Dublin with other cities in California; they found that Dublin has a relatively high number of collisions involving pedestrians, particularly youth and elderly pedestrians, and collisions involving high vehicle speeds. Opportunity areas to improve walking conditions in Dublin include traffic calming programs, transportation demand management policies and programs, coordination with health agencies to promote walking and biking, and more. This Assessment also includes specific areas of Dublin where pedestrian conditions could significantly benefit from improvements, which will be reviewed in this Plan.

### *Bicycle and Pedestrian Master Plan (2014)*

Adopted in 2014, Dublin's Bicycle and Pedestrian Master Plan (2014 Plan) established key goals and policies to maintain and improve biking and walking infrastructure. Goals and policies support the 2014 Plan's Vision for Dublin:

> The purpose of the City of Dublin Bicycle and Pedestrian Plan is to provide a policy and implementation framework for maintaining and improving bicycle and pedestrian infrastructure in the City. This Plan envisions a network of safe, comfortable, and attractive facilities that meet the needs of users of all ages and abilities and connect users with key destinations—schools, residential neighborhoods, parks, shopping areas, and job centers—within the City and in adjacent jurisdictions.

An inventory of the bicycle and pedestrian network and potential improvements to specific facilities are documented. Infrastructure projects at key locations are organized by priority into four tiers and are intended to actualize the proposed biking and walking network. Programming opportunities to attract biking and walking trips are also identified in the 2014 Plan. In addition to providing an inventory of potential funding sources for project implementation, the 2014 Plan includes bicycle and pedestrian design guidelines that apply national resources and best practices to project implementation in Dublin.

### *General Plan Land Use & Circulation: Circulation & Scenic Highways Element and Schools, Public Lands, & Utilities Element (2014)*

The General Plan's Land Use & Circulation Elements focus on meeting the mobility needs of all roadway users by any mode and aligns with two key documents, the City of Dublin's Complete Streets Policy (City Council Resolution 199-12) and the Tri-Valley Transportation Plan (a regional plan). The Element promotes the use of local and regional trails and emphasize improving experiences walking and taking

transit. The Elements name two areas, the Eastern Extended Planning Area and Downtown Dublin, where active transportation investments are a priority.

The Elements' Guiding Policies that are the most relevant to this Plan include:

5.3.1.A.3 Encourage improvements in the Enhanced Pedestrian Areas to improve the walkability of these areas.

5.5.1.A.1 Provide safe, continuous, comfortable and convenient bikeways throughout the City.

5.5.1.A.2 Improve and maintain bikeways and pedestrian facilities and support facilities in conformance with the recommendations in the Dublin Bicycle and Pedestrian Master Plan.

5.5.1.A.3 Enhance the multi-modal circulation network to better accommodate alternative transportation choices including BART, bus, bicycle, and pedestrian transportation.

5.5.1.A.4 Provide comfortable, safe, and convenient walking routes throughout the City and, in particular, to key destinations such as Downtown Dublin, the BART Stations, schools, parks, and commercial centers.

### *Parks and Recreation Master Plan (2015)*

The Parks and Recreation Master Plan establishes goals, standards, guiding policies, and action programs to guide the City in the acquisition, development and management (operations and maintenance) of parks and recreation facilities. Goals and guiding policies and actions identified in the plan encourage creation of a continuous network of linear parks, paths, walks, and trails to enable travel by non-motorized modes. The standards and criteria for the City's parks and recreation facilities include requirements for bicycle parking, paving, and right-of-way width.

### *Iron Horse Regional Trail Feasibility Study (2017)*

Based on a multimodal assessment and community outreach processes, this Feasibility Study arrives at several key preferred alternatives for the Iron Horse Regional Trail and its crossings on Dougherty Road, Dublin Boulevard, and the Dublin/Pleasanton BART station. A multi-use trail separating people walking and biking was preferred; a bicycle/pedestrian bridge was preferred for crossing Dublin Boulevard, while an at-grade crossing was preferred for Dougherty Road. Improvements near the BART station are intended to both enhance access to transit and improve experiences for trail users passing through the station area. Improvements to the Iron Horse Regional Trail contribute to this Plan by making use of the Trail easier and more convenient.

### *Traffic Safety Study Update (2018)*

Collisions were studied in the 2018 Traffic Safety Study Update (Update) to evaluate safety performance on specific street sections and intersections. Overall, collisions had recently increased at the time of this Update, but there were also more people living and driving in Dublin, particularly East Dublin. Based on recent collision history, certain street sections and intersections merited improvements, such as continuous bicycle lanes at Central Avenue and Tassajara Road. The collision analysis included in this Plan supplements the findings and recommendations of the Update.

### *Climate Action Plan (2020)*

The Climate Action Plan (CAP), Climate Action Plan 2030 and Beyond, establishes the City's vision for reducing greenhouse gas (GHG) emissions by 2045. The CAP names transportation as the largest source of emissions in Dublin and lays a plan for Dublin to become carbon neutral by 2045. Zero-emission vehicles and mode shift to biking, walking, and transit trips are key strategies to reduce Dublin's GHG emissions and meet citywide targets. The CAP sets measures to develop plans and programs around transportation demand management, transit-oriented development, parking management, and electric vehicle infrastructure planning to support mode shift and electrification of the Dublin's vehicle fleet. As stated in the CAP, a shift to alternative, active, shared, and electric mobility will provide safer routes between home, transit stops, and other community amenities, reduce greenhouse gas emissions, reduce traffic congestion, improve public health outcomes, and have economic benefits.

### *Downtown Streetscape Master Plan (2020)*

The Downtown Streetscape Master Plan provides direction for public and private investment, specifically in regard to the development of the public realm and Downtown's identity. One of the plan's key goals is to develop pedestrian-oriented environments on Commercial Throughways and on Downtown Local Streets. On these roadways as well as on Crosstown Boulevards and Parkways, the plan also emphasizes providing safe and comfortable facilities and crossings for people walking and biking. Recommended improvements to Downtown are prioritized into four tiers that can be matched to project scale, budget, funding source, and other opportunities. Tier 1 and Tier 2 street and pedestrian enhancements are illustrated on Figure 3 and Figure 4 and include restriping/road diet evaluation, sidewalk expansion, intersection and mid-block crossing treatments, as well as art and wayfinding opportunities. Notable guidelines include expanding sidewalks to provide a minimum 12-foot sidewalk with minimum five- to six-foot clear throughway zone for walking.

### *Specific Plans*

Four areas of Dublin have specific plans that outline guiding principles, policies, and design guidance related to active transportation: Dublin Crossing, Downtown, the Dublin Village Historic Area, and Eastern Dublin.

### *Dublin Crossing (2013)*

This Specific Plan focuses on improving east-west connectivity in the Dublin Crossing, particularly between transit stops, destinations, and trails. A relevant guiding principle in this Specific Plan is to make it easier and more convenient for people to access and use the Iron Horse Regional Trail, the Dublin/Pleasanton BART station, and retail destinations without a car.

### *Downtown Specific Plan (2014)*

Guiding principles pertinent to biking and walking in Downtown aim to create pedestrian-friendly streets, pedestrians, and bicyclists, enhance multimodal travel options, and cultivate pedestrian connections to retail destinations. Transit-oriented development and lighting should be scaled to people walking in Downtown. Pedestrian connectivity between buildings, parking, and sidewalks should be maintained throughout Downtown, and pedestrian amenities like street furniture are encouraged.

### *Dublin Village Historic Area (2014)*

Placemaking, creating a positive experience for people walking, and attracting people to this area are key goals of this Specific Plan. Creating positive experiences for people walking includes providing more crosswalks and median refuges, calming vehicle traffic, adding pedestrian amenities or a plaza, and implementing pedestrian-scale lighting and wayfinding.

### *Eastern Dublin (2016)*

A key goal in the Eastern Dublin Specific Plan is to reduce reliance on single-occupancy vehicles by planning the area's land uses to naturally promote walking, biking, taking transit, and ridesharing. Notably, development with a higher intensity is encouraged near transit corridors in Eastern Dublin. Relevant policies in this Specific Plan include:

- Providing sidewalks in the Town Center and Village Center
- Requiring development to balance pedestrian, bicycle, and automobile circulation
- Creating a north-south trail along Tassajara Creek and other streams
- Establishing a bike network that meets both travel needs and recreational opportunities
- Providing bicycle parking at key destinations

## BENCHMARKING INTERVIEWS SUMMARY

Benchmarking interviews were conducted virtually with representatives of seven City departments and the Dublin Unified School District (DUSD) in April and May 2020. The purpose of the benchmarking interviews is to understand each relevant City department and DUSD's active transportation policies, programs, and needs that both support and can be supported by the Plan. Points of emphasis from the interviews will inform the Plan's recommendations and are described and summarized in this section.

Interviewees' complete responses can be found in the Appendix. Interviews were conducted with the following City departments and DUSD:

- Traffic
- Economic Development
- Community Development
- Fire
- Police
- Maintenance
- Parks and Community Services

Emphasis areas emerged as either a theme across multiple interviews or as single points of discussion that are particularly relevant to biking and walking in Dublin. Recommendations draw upon these emphasis areas within the framework of the City's existing policies and plans, as detailed in the previous section of this memo. Policy and program recommendations are intended to act as a starting point for the Plan, and they may be updated and refined as technical analyses and community engagement processes continue.

Emphasis areas, specific topics of each emphasis area, and draft recommendations (where applicable) are described in Table 2.

**Table 2: Benchmarking Interview Themes**

| Emphasis Area | Topic | Recommendation |
|---|---|---|
| Desire for stronger policies | 2014 Bicycle and Pedestrian Master Plan and Design Guidelines | Back the design guidelines with policy to require adherence to the Guidelines |
| | | Consider approving the Plan in the form of a City resolution or ordinance |
| | | Implement amendments to the Municipal Code to require priority design elements as part of development project implementation. |
| | Standard plans for new development | Update design standards to include bicycle and pedestrian-friendly standards, such as smaller driveway turning radii |
| | Unclear bicycle and pedestrian improvement processes | Craft a policy, or accompanying tool, that provides clear direction for bicycle/pedestrian project implementation |
| | | Create a priority project list of identified improvements that can be applied to development projects as community benefits. |
| | Tension with General Plan policies | Consider modifying policies in the General Plan Circulation Element that facilitate auto-centric development or standards |
| | Vision Zero | Consider implementing a Vision Zero policy in Dublin |

| Emphasis Area | Topic | Recommendation |
|---|---|---|
| Unclear bicycle and pedestrian project implementation processes | Coordinating with proposed development projects | Establish clear development standards and implementation requirements for new development. |
| Coordination challenges in implementing bicycle and pedestrian improvements | Intersection treatments for bicyclists and pedestrians that impact vehicle operations | Establish guidance to assist decision makers in determining design solutions when tradeoffs are involved |
| | Filling gaps in the bicycle and pedestrian network with developers' improvements | Coordinate development review processes with the implementation plan for the proposed bicycle and pedestrian network |
| | City's plans concurrently in development | Incorporate bicycle and pedestrian improvements into the City's ongoing plans, such as the Downtown Streetscape Master Plan, to identify and secure various funding sources for bicycle/pedestrian projects |
| | Communication with developers and business owners | Consider implementing a transportation demand management program. Conduct a travel survey focused on walking, biking, and transportation demand management to Dublin's business community. Develop and continually update a spatial database of bicycle and pedestrian counts. |
| | Regional coordination | Consider coordinating bicycle and pedestrian improvement projects through regional channels, particularly in the Tri-Valley area, that already exist due to |

| Emphasis Area | Topic | Recommendation |
|---|---|---|
| | | enforcement needs and economic development opportunities |
| Staffing needs | Coordinating and implementing bicycle and pedestrian projects | Hire at least one full time dedicated staff person (per 100,000 population) to meet the League of American Bicyclist's Bronze Standard |
| | School crossing guards and traffic enforcement near schools | Consider hiring more sworn or unsworn police officers to enforce road rules near schools |
| Emergency response vehicle needs | Vertical deflection in bicycle facilities | Design speed tables and Class IV bicycle facilities with the Fire Department for application in Downtown Dublin |
| | Speed management and traffic calming devices | Develop a pre-approved list of traffic calming devices with the Fire Department |
| Barriers to connectivity | Freeways | Continue to coordinate with the California Department of Transportation (Caltrans) to minimize negative effects of highways to people walking and biking |
| | Limited east-west connectivity through Downtown Dublin and between parks | |
| | Lacking pedestrian facilities on undeveloped parcels | Consider paving sidewalks at key locations to fill gaps in the pedestrian network |
| | Incomplete intersections and trail crossings | Establish design standards for trail crossings and for trails that run adjacent to roadways |

| Emphasis Area | Topic | Recommendation |
|---|---|---|
| | | Consider implementing special accommodations (such as the East Dublin BART station and Iron Horse Trail connection) for bicyclists at trail crossings with the Fire Department's approval |
| Non-infrastructural barriers to biking and walking | High vehicle volumes and speeds | Consider traffic calming, bulb-outs, and narrowing vehicle travel lanes to reduce traffic stress to pedestrians and bicyclists |
| | | Identify opportunities for paseos and shared-use paths in Downtown to separate vehicles from people walking and biking |
| | Lacking wayfinding for bicyclists and pedestrians | Include wayfinding standards and implementation considerations (such as cost and timeline) in the Plan |
| | | Provide guidelines for consistent visual cues to people walking and biking in the Plan |
| | Safety concerns or discomfort while walking or biking | Coordinate projects to address safety needs at schools between DUSD, the City's Transportation Department, and Dublin Police |
| | | Identify locations where lighting can be improved on Dublin's trails |
| | | Implement transportation demand management programs, such as BART |

| Emphasis Area | Topic | Recommendation |
|---|---|---|
| | | shuttles, that can supplement bicycle and pedestrian infrastructure |
| | | Treat locations where people walking and biking have conflicted with vehicles entering or exiting driveways, such as at the Senior Center |
| Unclear maintenance protocols or responsibilities | Trail sweeping | Establish general bicycle and pedestrian facility maintenance policies and standards in the Plan |
| | Bicycle facility paint | Consider developing a maintenance plan for Dublin's bicycle facilities, including painting and sweeping needs |
| Challenges in implementing CALGreen standards | Requesting bike showers and lockers in new development | Provide direction in the Plan of how to implement CALGreen standards in the development process |
| Unknown bike parking and amenities demand and needs | Bike parking implementation and long-term use | Consider requiring bike parking analysis when parking studies are conducted in Dublin |
| | | Consider focusing bike parking in areas where there is assumed bike demand, such as job centers, the BART stations, and technology-focused businesses |
| | | Craft a policy or objective to establish an inventory of bicycle facilities, parking, and amenities throughout Dublin, including in |

| Emphasis Area | Topic | Recommendation |
|---|---|---|
| | | parks, that can also be used for maintenance plans |
| | | Include bike parking in the Plan's Design Guidelines |
| | Bike parking needs at parks and events | Install bike parking racks at parks that complies with the Draft Parks and Recreation Master Plan or where there is a demonstrated need, including at Stagecoach and at the Sports Grounds |
| | | Require temporary wayfinding signage at events to notify attendees of bike valet |
| Differing speeds of people walking and biking on a single facility | E-bikes | Develop a policy and design standards in the Plan that address varying users' speeds on a single facility |
| | Multi-use trails in parks | |

Source: Kittelson & Associates, Inc. 2020.

## PROGRAMS OVERVIEW

In the benchmarking interviews, City and DUSD staff described how several City programs support biking and walking in Dublin. Programs are also described on the City's website and in the 2014 Bicycle and Pedestrian Master Plan. Programs support and aim to implement the City's policies and goals. The City's active transportation programs are described in Table 3.

**Table 3: Active Transportation Programs**

| Program | Description | Managing Department |
|---|---|---|
| Bicycle and pedestrian counts | Bicycle and pedestrian counts are included in the City's turning movement counts. Bike counters collect data on the Iron Horse and Alamo Canal Trails. Bicycle and pedestrian count data are also provided to the City in environmental documents and traffic studies. | Traffic and Planning |
| Safe Routes to School (SRTS)[1] | SRTS aims to establish routes which maximize safety for travel to and from school sites, as well as to educate school administrators, parents, and children about vehicle, bike, and pedestrian safety. | DUSD with support from Alameda CTC, several City Departments, including Police, Planning, and Traffic |
| Adult school crossing guards[2] | Crossing guards help children safely cross the street at key locations on the way to school. Crossing guards may help parents more comfortably allow students to walk or bike to school while setting an example of how to safely cross the street. | DUSD, Police, and Traffic |
| Bike to Work Day[3] | Bike to Work Day is a City-sponsored activity that encourages commuters to bike to their place of work. The event includes energizer stations for refreshments and giveaways. Bike to Work Day is expected to be held on September 24, 2020. | Traffic and Environmental Programs |

Notes:

1. Source: https://dublin.ca.gov/349/Safe-Routes-to-School
2. Source: http://guide.saferoutesinfo.org/crossing_guard/index.cfm
3. Source: https://dublin.ca.gov/954/National-Bike-Month-Activities

Additional program details and needs are provided below:

- A recommended action item from the 2014 Bicycle and Pedestrian Master Plan not yet implemented is a GIS database of bicycle and pedestrian counts by location. The database should be continually updated as the City receives and collects new count data.
- The City integrates SRTS into planning processes through the City's partnership with Alameda CTC's Safe Routes to Schools Program (SR2S) Program.[1] When development projects include a new school, the Planning Department and DUSD coordinate to evaluate connections to the school.
    - There is a need to designate a staff person at DUSD and the City who are responsible for coordinating and overseeing school connectivity. This staff responsibility would ensure that school access is sufficient from the planning stage all the way through to the operation of schools.
- The Transportation Department fields requests for crossing guards, and school principals determine crossing guard needs for their school. Dublin Police then hires the crossing guards and manage the program.
    - A coordination protocol may be needed between DUSD and the Transportation Department to jointly identify and cross-check crossing guard needs.

## KEY NEEDS AND RECOMMENDATIONS

In compiling the non-infrastructure inventory described in this memo, several needs and recommendations became clears. These bicycle- and pedestrian-related needs and recommendations are described below:

- Vehicle speeds and volumes were identified in benchmarking interviews as challenges to walking and biking comfortably in Dublin. Additionally, the Pedestrian Safety Assessment (2014) recommends improve walking conditions using traffic calming programs, transportation demand management (TDM) policies and programs, and coordination with health agencies to promote walking and biking. TDM programs could be informed by surveys conducted with the business community and bicycle and pedestrian counts.
- Active transportation investments in East Dublin and Downtown Dublin are considered a priority in the General Plan Land Use & Circulation Element. Biking and walking needs in these geographic areas, gaps in the walking and biking network, and safety treatments near parks, senior centers, and schools should be considered in the Plan's prioritization framework. Additionally, a database of bicycle and pedestrian counts would guide investments.
- Guided by the Plan's updated Design Guidelines, trail crossings and complete intersections should be implemented through coordinated development processes and special accommodations for bicyclists and pedestrians that the Fire Department may provide. Notably,

[1] Alameda CTC administers the Alameda County SR2S Program, which also includes the International Walk and Roll to School Day as part of its programming.

crossing conditions on the Iron Horse Regional Trail can be improved at Dublin Boulevard, Dougherty Road, and the Dublin/Pleasanton BART station.

- Driveways were identified as a potential point of conflict for bicyclists and pedestrians, and radii should be modified to both enhance the safety of people walking and biking and accommodate emergency response vehicles. Additionally, road safety treatments are identified in the Plan's collision analysis.
- East-west connectivity, particularly through Downtown and to the City's parks, was emphasized as a need in benchmarking interviews. The Dublin Crossing Specific Plan (2013) also identifies this need, particularly between transit stops, destinations, and trails.
- Promoting and facilitating biking and walking to local destinations is a need in Dublin, according to benchmarking interviews, several specific plans, and the draft CAP (2020). A travel survey with the business community could provide additional insight as to how to make biking and walking an appealing option for more residents, commuters, and visitors.
- Improved coordination and clearer work processes to implement bicycle and pedestrian projects are needed to upgrade and expand the bicycle and pedestrian network, establish maintenance plans and ongoing infrastructure needs, and maximize both local and regional resources.

## Next Steps

Upon receiving comments from the City, Kittelson will revise and finalize this non-infrastructure inventory, which will then be used as the basis for program and policy recommendations in the Plan. Kittelson will prepare cost estimates and an implementation plan for recommended policies and programs and will work with the City to identify which, if any, of the recommendations could be further developed within the Plan.

# APPENDIX B

# EXISTING CONDITIONS: DEMOGRAPHIC ANALYSIS

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# MEMORANDUM

Date: June 22, 2020 Project #: 24392

To: Sai Midididdi, TE
City of Dublin

From: Amanda Leahy, AICP, Mike Alston, RSP, Quinn Wallace, Erin Ferguson, PE, RSP

Project: Dublin Bicycle and Pedestrian Master Plan

Subject: Demographic Analysis

The City of Dublin (City) is updating the 2014 Dublin Bicycle and Pedestrian Master Plan (Plan). The Plan will serve as a comprehensive action plan for the City to provide improved bicycle and pedestrian facilities for its residents, employees, and visitors. As part of the baseline conditions and needs assessment, Kittelson & Associates, Inc. (Kittelson) gathered and summarized demographic data. The findings of this demographic analysis will inform the Plan's bicycle and pedestrian demand analysis. After completing the baseline conditions and needs assessment, this analysis may be used in prioritizing the Plan's projects, identifying project and program recommendations, and developing an implementation plan.

This memorandum (memo) details the methodology, maps, tables, and charts produced to analyze Dublin's demographics. Charts, tables, and graphs provide additional context by comparing key Dublin demographics to the same statistics across Alameda County. The memo is organized into the following sections:

- Methodology
- Map Packages
    - Population – Race/Ethnicity and Age
    - Workers – Travel Modes and Times
    - Households – Income, Vehicles, and Health
- Comparison of City of Dublin to Alameda County
- Next Steps

Maps included in each of the map packages are as follows:

- Population – Race/Ethnicity and Age
    - Total Population of Block Groups
    - Total Population of Transportation Analysis Zones

  - Minority Race/Ethnicity Population
  - Population Under Age 18
  - Population Ages 65 and Older
- Workers – Travel Modes and Times
  - Number of Workers per Block Group
  - Commuters by Public Transportation
  - Pedestrian Commuters
  - Commuters by Bicycle
  - Commuter Travel Times Greater than 30 Minutes
- Households – Income, Vehicles, and Health
  - Number of Households per Block Group
  - Number of Households per Transportation Analysis Zone
  - Household Income Under 25% of City Median Income
  - Household Income 25% - 50% of City Median Income
  - Household Income 50% - 100% of City Median Income
  - Household Income 100% + of City Median Income
  - Zero Car Households
  - CalEnviroScreen

## METHODOLOGY

Data sets from the U.S. Census the California Communities Environmental Health Screening Tool (CalEnviroScreen) were used in this analysis. The CalEnviroScreen is generated by the California Office of Environmental Health Hazard Assessment (OEHHA) and maps disadvantaged areas statewide based on a number of indicators generated from socioeconomic and environmental health data. Those data include pollution exposure, environmental effect, sensitive population, and socioeconomic indicators. The CalEnviroScreen tool produces an overall score for each census tract and compares the results as percentiles across all of California. Communities within the top 25th percentile statewide are considered disadvantages communities under the California Department of Transportation (Caltrans) Active Transportation Program grant guidelines.

CalEnviroScreen data is summarized at the Census tract level, while all other Census data sets are summarized at the block group level (i.e., more granular). CalEnviroScreen indicators fall into four broad groups—exposures, environmental effects, sensitive populations, and socioeconomic factors. In Dublin, there are 10 tracts containing 19 block groups. Block groups are shown in the **Total Population of Block Groups, Number of Workers per Block Group,** and **Number of Households per Block Group** maps. Census data variables were grouped into categories that show the relevant demographic trends in Dublin. The block groups are described in more detail below.

Demographic data primarily came from the Census's American Community Survey (ACS) 2014-2018 5-Year Estimates. Variables from these data sets include:

- Age
- Race and ethnicity
- Household income
- Commute mode
- Commute time
- Vehicles per household

In addition to using data sets from the American Community Survey (ACS), data was obtained from the Census's Longitudinal Employer-Household Data (LEHD) dataset.[1] The analysis related to jobs was conducted on primary jobs, which includes the highest paying job per individual worker (one person per job). This includes both public and private sector jobs.

## Census Block Group Data

Because block groups do not coincide with municipal boundaries, some judgment is required when determining which block groups to include in Dublin analysis for two reasons:

1. Block groups abutting the City boundaries but not fully contained within Dublin must either be included or excluded. Block group 4505022 on the western boundary and block groups 4507521 and 4507511 on the eastern boundary include substantial land area outside City boundaries, but all or most of the population in each case is within City boundaries (based on the distribution of development). Therefore, all three are included in analysis.
2. Block groups may include land and/or population which this plan will have no ability to impact. Two such block groups are block group 4501022, which exclusively includes the Santa Rita County Jail, and block group 4501021, which includes the Camp Parks US Army facility but also includes land developed separately (including the Dublin Crossing development). Camp Parks land is owned and planned by the federal government and is outside the City's planning jurisdiction. The area is generally excluded from the realm of this Plan.

Data for block group 4501022 will be excluded from analysis, given that the population's movements and mobility needs are limited to the jail site. Workers within this census block group are identified in the ACS based on their place of residence. A discussion of the populations contained within the 4501021 block group informs whether to retain its data in the analysis. A discussion of the population distribution is included in the next section.

## Comparison to Travel Demand Model

As previously mentioned, this demographic analysis forms the basis for forthcoming demand analysis, prioritization, and project and program recommendations. The variables explored in this analysis will

[1] LEHD data is available online at http://onthemap.ces.census.gov/.

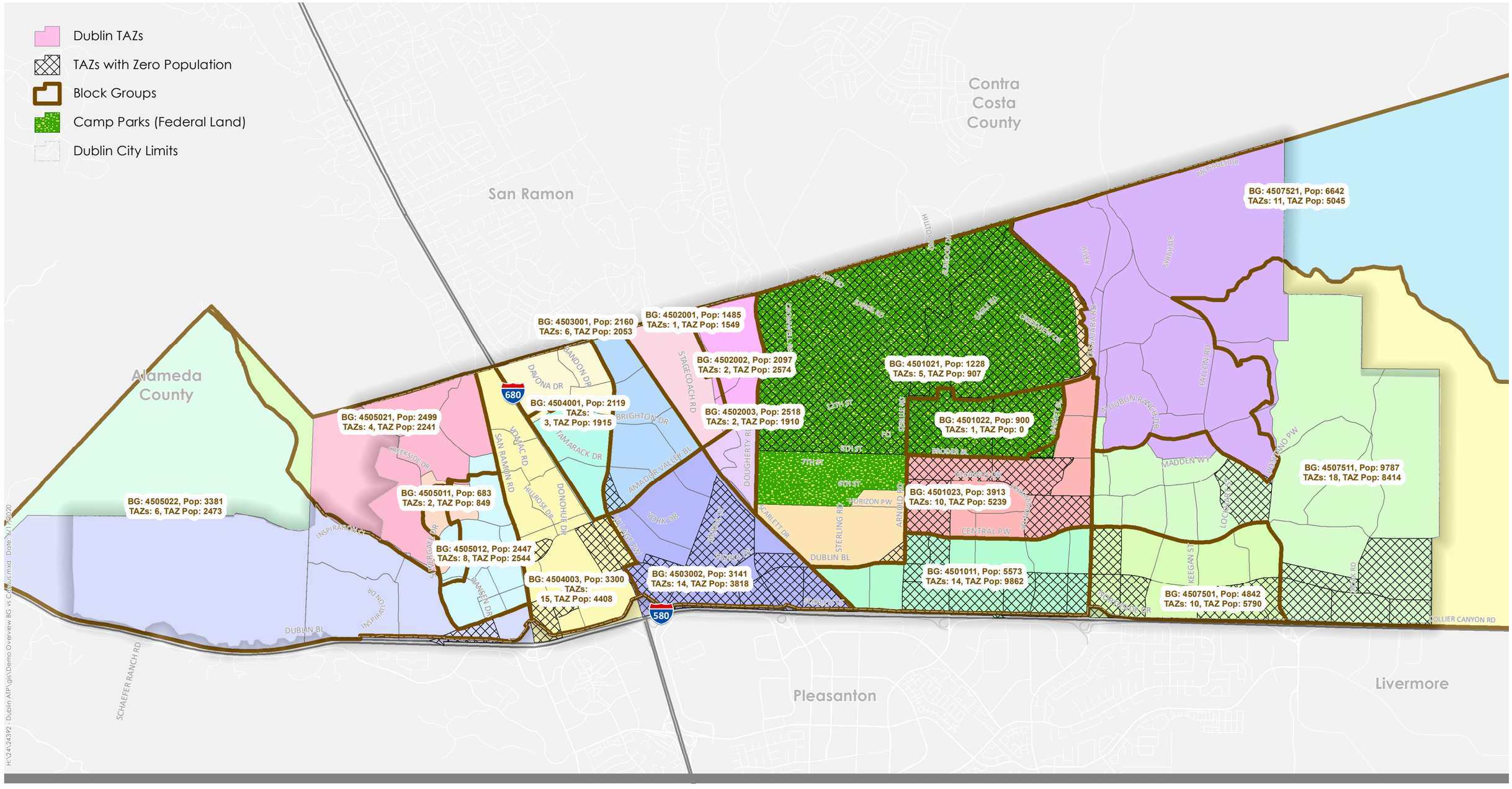
allow the City to spatially prioritize with sociodemographic factors. These demographic data are available from the ACS at the block group level—approximately 19 block groups wholly or partially within City limits. The City maintains a transportation model, which provides smaller units of analysis called transportation analysis zones (TAZs). By comparison, the city is comprised of 134 TAZs. TAZs provide a more granular unit of analysis but fewer demographic variables overall. The relevant data provided by the City model (including data representing 2017) include population and household totals (2017 estimated values) which can be compared to the ACS data.

Figure 1 presents a comparison between block group and TAZ population values. TAZ population is aggregated to the block group level for comparison; where TAZs intersect multiple block groups, they are aggregated to the block group that contains their centroid. The comparison shows the values to be generally within approximately 10 percent of one another, with some differences explained by the boundaries that are not coincident.

The comparison also shows that block group 4501021 (containing Camp Parks land) has a similar population estimate with the associated TAZs, although a majority of this block group's land is on Camp Parks land. The population accounted for in this block group primarily resides in the southern portion of the block group (outside the Camp Parks land), so the block group population is retained for this analysis. Going forward, the demand analysis and prioritization work using these data will account for the population being concentrated in the southern part of the of the block group.[2] The demographic information associated with this block group will be included and carried forward in future analysis.

Figure 1 also shows several TAZs with no population—in particular, the centrally located TAZ within block group 4501022. This block group contains the Santa Rita County Jail. ACS data report a population of 900, which exclusively includes inmates (counted as group quarters population).

[2] A closer inspection of available ACS data revealed that among the approximately 1,135 residents over age 16 in the block group, 18 are employed in the armed forces.




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DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

Figure 1

**Census Block Groups versus City Model TAZs**
**Dublin, California**

# MAP PACKAGES

Maps produced in this analysis spatially present demographic data in Dublin only. Graphs, charts, and tables in this memo provide additional context and comparisons to all of incorporated and unincorporated Alameda County.

The maps are grouped into three packages:

- Population – Race/Ethnicity and Age
- Workers – Commute Modes and Times
- Households – Income, Vehicles, and Health

The group is shown first in each map series to provide an overview and is followed by maps analyzing unique variables. For example, the number of households per block group are shown first, followed by a map of household income grouping.

## Population – Race/Ethnicity and Age

This map package shows proportions of racial and ethnic minorities and age groups by each block group's population. Maps in this package include the following:

- Total Population of Block Groups
- Total Population of Transportation Analysis Zones
- Minority Race/Ethnicity Population
- Population Under Age 18
- Population Ages 65 and Older

### *Race/Ethnicity*

In this package, the **Minority Race/Ethnicity Population** map shows the percent of individuals who identify within a minority race or ethnicity. To form this category, the following Census demographics were grouped together:

- Black or African American Alone
- American Indian and Alaska Native Alone
- Asian Alone
- Native Hawaiian and Other Pacific Islander Alone
- Some Other Race Alone
- Two or More Races
- Hispanic or Latino

Individuals that are white alone (not Hispanic or Latino) are excluded from this category. The Census defines Asian individuals as "a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent." The ACS does provide subgroup estimates that better

clarify the respondents who indicate *Asian alone* as their race; those estimates are only available at the City level.

Within Dublin, the 26,672 Asian residents are comprised of the following groups, in descending proportional order:[3]

- Asian Indian: 12,627 (47% of Asian alone residents)
- Chinese, excluding Taiwanese: 7,160 (27% of Asian alone residents)
- Filipino: 2,040 (8% of Asian alone residents)
- Vietnamese: 1,650 (6% of Asian alone residents)
- Korean: 1,139 (4% of Asian alone residents)
- Pakistani: 452 (2% of Asian alone residents)
- Japanese: 428 (2% of Asian alone residents)
- Taiwanese: 260 (1% of Asian alone residents)

### *Age*

Three maps show three age groupings relative to block group populations:

- **Population Under 18** to show concentrations of where children live
- **Population Age 65 and Older** to show concentrations of where seniors live

## Workers – Commute Modes and Times

This map package shows proportions of key commute modes, including commutes by bicycle, walking, and public transportation, by each block group's number of workers. Charts and tables provided in this section compare commute mode trends and findings using LEHD data. Maps in this package include the following:

- Number of Workers per Block Group
- Commuters by Public Transportation
- Pedestrian Commuters
- Commuters by Bicycle
- Commuter Travel Times Greater than 30 Minutes

[3] Other groups in Dublin comprising less than 1% of Asian residents include Bangladeshi, Bhutanese, Burmese, Cambodian, Hmong, Indonesian, Laotian, Malaysian, Mongolian, Nepalese, Okinawan, Sri Lankan, Thai, *other unspecified*, and *two or more*. Note that the 26,672 total is based on city-level data and varies slightly from the aggregated Census block group totals presented later in this memorandum.

### *Commute Modes*

Three maps display commute modes that are central to the Plan, including **Commuters by Public Transportation, Pedestrian Commuters,** and **Commuters by Bicycle.** Due to significant differences between block groups and relatively low percentages, the count of each commuter type per block group is shown in a bubble in addition to the percentages.

Notably, one outlier is shown in the **Commuters by Bicycle** map: one block group has 44 bicycle commuters, amounting to over 20% of its 166 workers. The high proportion of bicycle commuters in this block group may be attributable to the Army Base located in this block group.

On the **Commuters by Public Transportation** map, high proportions of transit commuters can be found not only near the Dublin/Pleasanton BART station, but also where the Alamo Canal Trail and Iron Horse Trail converge. The Iron Horse Trail connects directly to the BART station and is about a 1-mile bicycle ride. Other densities of transit commuters are likely attributable to the number of workers in the block group, such as near the Martin Canyon Creek Trail.

### *Commute Times*

A single map, **Commuter Travel Times Greater than 30 Minutes**, shows the overall high proportions of commuters by block group with commutes over 30 minutes. On this map, commute mode is not considered, so a 30-minute walking or biking commute is classified the same as a 30-minute driving commute. This map may contextualize commute mode choices also displayed in this map package.

### *Dublin Workers and Commuters*

For purposes of the discussion that follows, the following terms are used:

- **Workers living in Dublin:** This term is used to define jobholders who live in Dublin. They may work in Dublin or elsewhere.
- **People working in Dublin:** This term is used to define people who work in Dublin. They may live in Dublin or elsewhere.

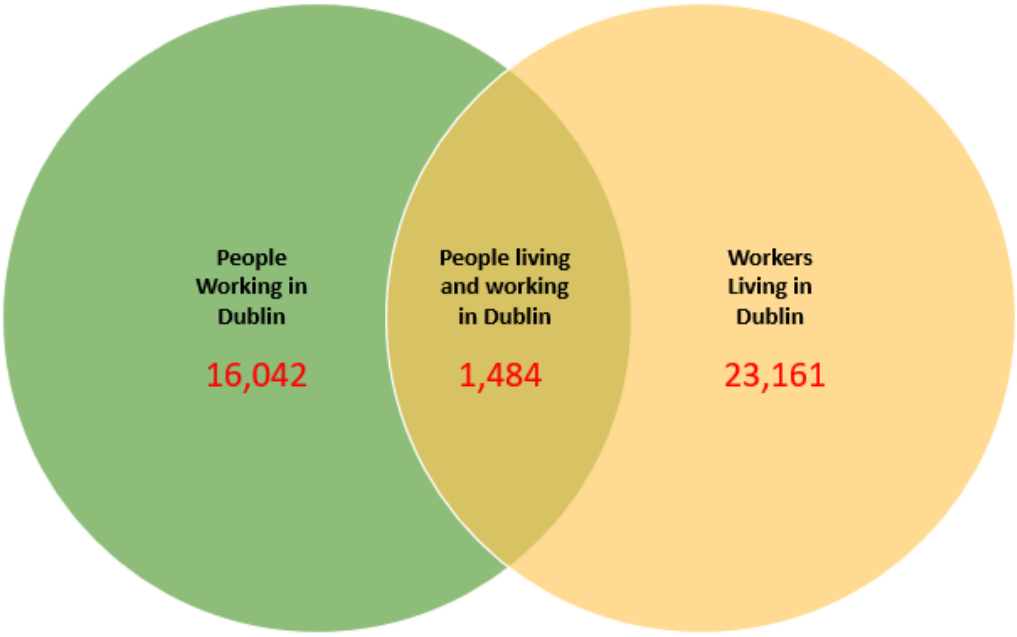
Based on the most recent LEHD data available (2017), the net inflow and outflow of Dublin workers is the following:

- 16,042 people commute into Dublin for work and live elsewhere ( these are people working in Dublin)
- 23,161 people live in Dublin and commute elsewhere to work (these are workers living in Dublin)

1,484 people live and work in Dublin (these are in both categories above)

Figure 2 presents this relationship visually.

**Figure 2: Workers by Residence and Job Location**



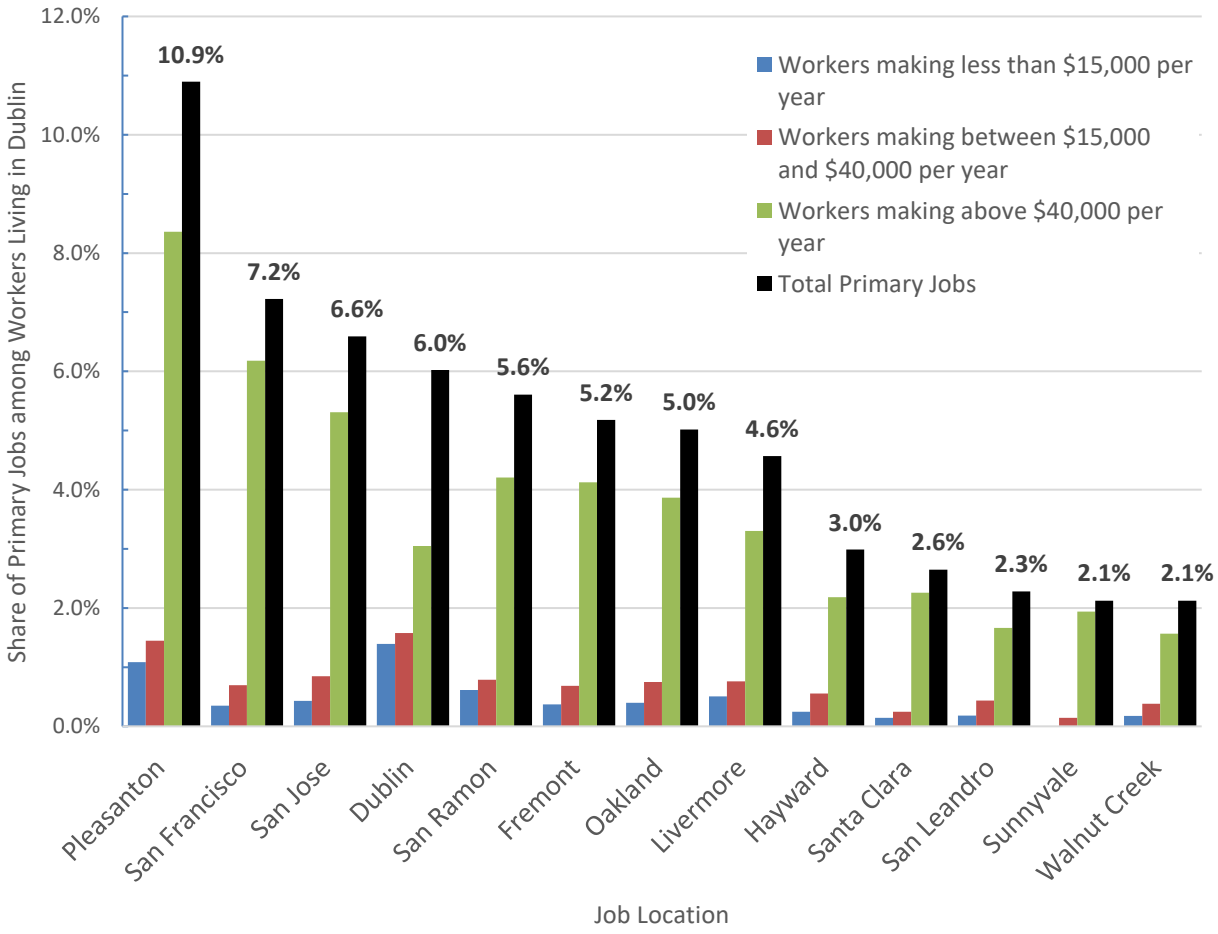

Source: Longitudinal Employer-Household Dynamics (LEHD), 2017.

### *Work Destinations*

Figure 3 shows that the top job locations of workers living in Dublin range from cities in Silicon Valley to neighboring jurisdictions, such as Pleasanton and San Ramon. San Francisco is the second most common job location after Pleasanton for workers living in Dublin. The home and work location provided by LEHD data are sorted into the three income groups presented.

Variation in job location exists by income; Dublin is the fourth highest job location overall, behind Pleasanton, San Francisco, and San Jose. Notably, the relative share of residents working in Dublin is lower among those who make above $40,000 per year compared to other locations.

**Figure 3: Top 10 Job Locations Among Workers Living in Dublin, by Income Level**




Source: Longitudinal Employer-Household Dynamics (LEHD), 2017.

### *Commute Distances*

As highlighted in Figure 3, approximately 6% of workers living in Dublin work in Dublin as well. As shown in Table 1, of the 24,645 workers living in Dublin, 71% work more than 10 miles from home. Compared to the share of total workers, a higher share of the lowest income workers work within ten miles (39% compared to 29%).

**Table 1: Commute Destinations Among Workers Living in Dublin (Primary Jobs)**

| Distance from Home to Work | Workers, by Income Level (Percent of Column) | | | |
|---|---|---|---|---|
| | Workers making less than $15,000 per year | Workers making between $15,000 and $40,000 per year | Workers making above $40,000 per year | All Workers |
| < 10 miles | 982 (39%) | 1,245 (30%) | 4,815 (27%) | 7,042 (29%) |
| 10 to 24 miles | 776 (31%) | 1,489 (36%) | 8,248 (46%) | 10,513 (43%) |
| 25 to 50 miles | 366 (15%) | 697 (17%) | 3,604 (20%) | 4,667 (19%) |
| >50 miles | 370 (15%) | 703 (17%) | 1,350 (7%) | 2,423 (10%) |
| **Total** | **2,494** | **4,134** | **18,017** | **24,645** |

Source: Longitudinal Employer-Household Dynamics (LEHD), 2017.

Table 2 provides the distance to home for people working in Dublin.

**Table 2: Commute Origins Among People Working in Dublin (Primary Jobs)**

| Distance from Home to Work | Workers, by Income Level (Percent of Column) | | | |
|---|---|---|---|---|
| | Workers making less than $15,000 per year | Workers making between $15,000 and $40,000 per year | Workers making above $40,000 per year | All Workers |
| < 10 miles | 1,004 (28%) | 1,355 (26%) | 2,657 (31%) | 5,016 (29%) |
| 10 to 24 miles | 1,087 (30%) | 1,813 (34%) | 2,830 (33%) | 5,730 (33%) |
| 25 to 50 miles | 721 (20%) | 1,090 (21%) | 1,648 (19%) | 3,459 (20%) |
| >50 miles | 835 (23%) | 1,043 (20%) | 1,443 (17%) | 3,321 (19%) |
| **Total** | 3,647 | 5,301 | 8,578 | 17,526 |

Source: Longitudinal Employer-Household Dynamics (LEHD), 2017.

The plurality of people who commute to Dublin from elsewhere travel 10 to 24 miles into work (approximately 33%). As shown in Table 2, the distances traveled leaving Dublin for work are generally higher than the distances traveled into Dublin for work.

## Households – Income, Vehicles, and Health

This map package shows proportions of key household metrics by each block group's number of households. Maps in this package include:

- Number of Households per Block Group
- Household Income Under 25% of City Median Income
- Household Income 25% - 50% of City Median Income
- Household Income 50% - 100% of City Median Income
- Household Income 100% + of City Median Income
- Zero Car Households
- CalEnviroScreen

### *Income*

The city's median income is used as the basis for comparing household incomes in Dublin. The city's median household income is $146,208.[4] The closest Census income level to Dublin's median household income is $150,000. Four household income groups were created to identify any concentrations of household incomes and any differences in access to key land uses by household incomes. The income groupings used on the maps are described below:

- **Household Income Under 25% of City Median Income** shows households with incomes between $0 and $35,000.
- **Household Income 25% - 50% of City Median Income** shows households with incomes between $35,000 and $75,000.
- **Household Income 50% - 100% of City Median Income** shows households with incomes between $75,000 and $150,000.
- **Household Income 100%+ of City Median Income** shows households with incomes at and above $150,000.

On the **Household Income Under 25% of City Median Income** map, a concentration of households earning less than $35,000 per year may be attributable to the Army Base located in this block group. This concentration also correlates with the number of bicycle and transit commuters in this block group, as shown in the **Commuters by Bicycle** and **Commuters by Public Transportation** maps.

[4] Source: City of Dublin Demographics. Retrieved from: https://www.dublin.ca.gov/1811/Demographics

Another concentration shown in the **Household Income 25% - 50% of City Median Income** map is located adjacent to the Martin Canyon Creek Trail. Notably, this block group also has a high proportion of transit commuters, as shown in the **Commuters by Public Transportation** map. This indicates an area of Dublin where income level and commute mode appear to be linked.

Similarly, high income level concentrations shown in the **Household Income 100%+ of City Median Income** map are linked to longer commute times. As shown in the **Commuter Travel Times Greater than 30 Minutes** map, high proportions of workers commuting more than 30 minutes in eastern block groups of Dublin are located where high proportions of households earn above the median income.

### *Vehicles*

Dublin's households with zero vehicles are spatialized in the **Zero Car Households** map. This map is shown to indicate where individuals may rely on biking, walking, and riding public transportation as their primary modes of travel.

### *Health*

As shown on the **CalEnviroScreen** map, Dublin's scores indicate that the city is minimally, if at all, disadvantaged from a perspective of health and environment compared to other California communities.

## Comparison of City of Dublin to Alameda County and East County Planning Area

For consistency with the data presented at the block group level, Dublin is represented by an aggregation of constituent tracts, as shown in the **Total Population of Block Groups, Number of Workers per Block Group,** and **Number of Households per Block Group** maps. This aggregation may include some people and households not within city limits. However, a comparison of the aggregated Census block totals compared to the Dublin City geography shows the population totals to be within 2 percent of one another.

Generally, people of color, particularly Black/African American and Hispanic or Latino groups, are among communities that have been historically disadvantaged in access to transportation services and infrastructure. In comparing racial and ethnicity statistics with Alameda County, this demographic analysis has not found that this trend is prevalent in Dublin. Like Alameda County, Dublin has an approximately 40%-60% split of Non-White Combined populations and white alone populations. Significant differences between Alameda County and Dublin are in the Black/African American Alone and Asian Alone populations. Indian (12,627) and Chinese Except Taiwanese (7,160) groups make up the majority of Dublin's Asian Alone (26,888) populations.

**Table 3: Comparison of Population Variables, Dublin and Alameda County, 2014-2018**

| Variable | Dublin | Alameda County |
|---|---|---|
| **Total Population** | **59,275** | **1,643,700** |
| *Race* | | |
| White Alone | 25,172 (42%) | 681,725 (41%) |
| Non-White Combined | 34,103 (58%) | 961,975 (59%) |
| Black/African American Alone | 1,769 (3%) | 177,135 (11%) |
| American Indian and Alaska Native Alone | 269 (<1%) | 10,712 (1%0 |
| Asian Alone | 26,831 (45%) | 486,434 (30%) |
| Native Hawaiian and Other Pacific Islander Alone | 217 (<1%) | 13,768 (1%) |
| Some or Other Alone | 1,294 (2%) | 169,771 (10%) |
| 2+ Races | 3,723 (6%) | 104,155 (6%) |
| *Age* | | |
| Population Under 5 Years Old | 4,486 (8%) | 97,506 (6%) |
| Population 5-14 Years Old | 9,462 (16%) | 192,220 (12%) |
| Population 15-24 Years Old | 4,738 (8%) | 197,570 (12%) |
| Population 25-44 Years Old | 20,698 (35%) | 516,424 (31%) |
| Population 45-64 Years old | 14,699 (25%) | 424,063 (26%) |
| Population 65+ Years Old | 5,192 (9%) | 215,917 (13%) |

Source: American Community Survey (ACS) 2014-2018 5-Year Estimates.

For transportation-focused data, Dublin characteristics are compared to the East County Planning Area as well, as it represents a more similar comparison to the City than the County overall.[5] Dublin has 8% more commuters who drive alone to work compared to Alameda County as a whole, as also shown by the lower percentages of commuters who bike, walk, or take transit to work. The commute mode in Dublin is more aligned with mode share of commuter in the East Planning Area of the County. In Dublin, 4% fewer commuters drive alone relative to the East Planning Area, and the 4% more commuters take transit.

[5] The East County Planning area includes Dublin, Pleasanton, Livermore, and unincorporated county area east of Hayward and Fremont. More information and the areas can be found in the Countywide Active Transportation Plan at https://www.alamedactc.org/planning/countywide-bicycle-and-pedestrian-plans/.

**Table 4: Comparison of Worker Variables, Dublin and Alameda County, 2014-2018**

| Variable | Dublin | Alameda County – East Planning Area | Alameda County |
|---|---|---|---|
| **Total Workers Age 16+** | **29,874** | **118,263** | **767,292** |
| *Commute Mode* | | | |
| Car/Truck/Van – Drove Alone | 20,544 (69%) | 86,523 (73%) | 471,802 (61%) |
| Car/Truck/Van – Carpooled | 2,829 (9%) | 9,923 (8%) | 75,493 (10%) |
| Public Transit (including Taxicab) | 4,004 (13%) | 10,136 (9%) | 115,383 (15%) |
| Motorcycle | 35 (<1%) | 343 (<1%) | 2,994 (<1%) |
| Bicycle | 116 (<1%) | 987 (1%) | 15,132 (2%) |
| Walked | 343 (1%) | 1,890 (2%) | 28,513 (4%) |
| Other Means | 136 (<1%) | 712 (1%) | 8,603 (1%) |
| Worked at Home | 1,902 (6%) | 7,749 (7%) | 48,111 (6%) |
| *Commute Time, not working from home* | | | |
| Travel Time < 30 minutes | 12,362 (44%) | 55,270 (50%) | 339,680 (47%) |
| Travel Time ≥ 30 minutes | 15,610 (56%) | 55,244 (50%) | 379,501 (53%) |

Source: American Community Survey (ACS) 2014-2018 5-Year Estimates.

When compared with Alameda County, Dublin has a lower proportion of households without vehicles. The percentage of households, 3% is similar to that in the East Planning Area of Alameda County, 4%.

**Table 5: Comparison of Zero-Vehicle Households, Dublin and Alameda County, 2014-2018**

| Variable | Dublin | Alameda County – East Planning Area | Alameda County |
|---|---|---|---|
| Total Households | 19,950 | 81,152 | 572,870 |
| *Vehicle Access* | | | |
| Zero-Car Households | 665 (3%) | 3,051 (4%) | 54,816 (10%) |

Source: American Community Survey (ACS) 2014-2018 5-Year Estimates.

When compared with Alameda County, Dublin has relatively high proportions of English-proficient households (that are not English only) and Spanish-speaking households with limited English

proficiency. Additionally, Dublin's proportion of zero-car households is 7% lower than Alameda County's proportion of zero-car households.

**Table 6: Comparison of Household Variables, Dublin and Alameda County, 2014-2018**

| Variable | Dublin | Alameda County |
|---|---|---|
| Total Households | 19,950 | 572,870 |
| *Home Language* | | |
| English Only | 10,051 (50%) | 314,017 (55%) |
| Other Language (English-proficient) Household | 8,297 (42%) | 205,763 (36%) |
| Limited English Proficiency Household | 1,602 (8%) | 53,090 (9%) |
| *Spanish* | *195 (8%)* | *16,454 (3%)* |
| *Other Indo-European Language* | *207 (1%)* | *4,453 (1%)* |
| *Asian/Pacific Islander* | *1,124 (6%)* | *30,082 (5%)* |
| *Other Language* | *76 (<1%)* | *2,101 (<1%)* |

Source: American Community Survey (ACS) 2014-2018 5-Year Estimates.

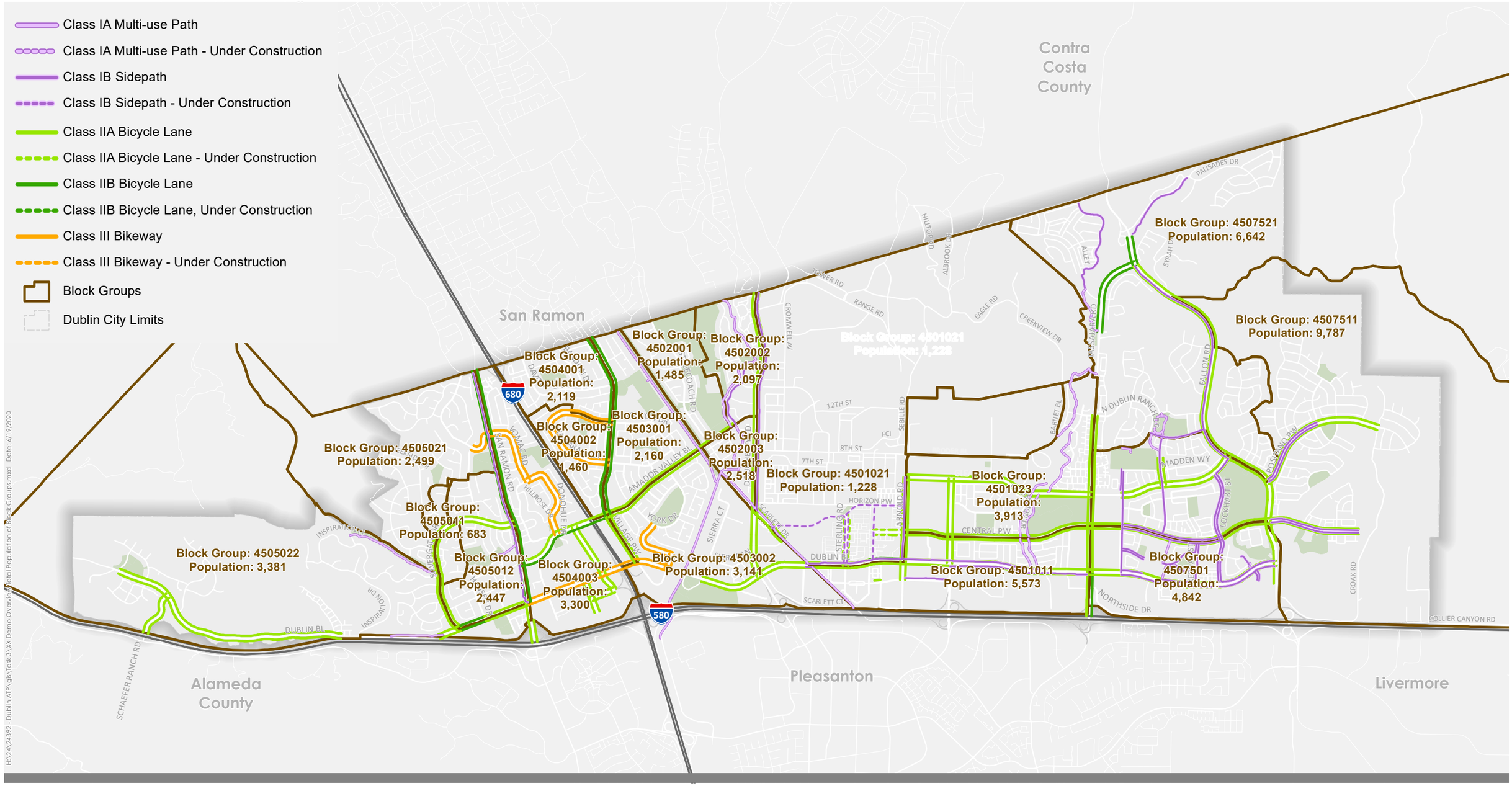
## SUMMARY AND NEXT STEPS

Key takeaways of this demographic analysis are described below:

- Land uses and accessible bicycle and pedestrian facilities likely influence the number of commuters who choose to bike, walk, or take transit, such as the high proportion of bicycle commuters in the Army Base's block group.
- Correlations are present in Dublin between commuters' travel times and household incomes. High-income households and commuters with travel times longer than 30 minutes are concentrated in the city's eastern block groups. Additionally, high proportions of jobs paying over $40,000 per year are located in San Francisco and San Jose, which likely require commute times longer than 30 minutes. While Pleasanton has the highest proportion of total primary job locations and locations where workers making above $40,000 per year, Dublin has one of the lowest proportions of job locations where workers make above $40,000 per year.
- Commuting distances for residents who leave Dublin for work are generally higher than the distances that workers travel into Dublin for work. Mode switch may be more feasible for people commuting to Dublin for work than vice versa.
- Several key demographic differences, including zero-car households and multi-lingual households, exist between Dublin and Alameda County. These differences may signify why people bike and walk in Dublin and how they access information regarding active transportation infrastructure and services.

The findings of this demographic analysis will inform the demand analysis, which will also be completed as part of the Plan's baseline conditions and needs assessment. The demand analysis will use the age data to develop walking and biking typologies among the Dublin population. After completing the baseline conditions and needs assessment, this analysis may be used in prioritizing the Plan's projects, identifying project and program recommendations, and developing an implementation plan. For project prioritization specifically, the data presented here provide an opportunity for the City to prioritize subgroups of its population based on indicators of relative transportation burden (e.g., presence zero-car households).

# MAP PACKAGE
# POPULATION – RACE/ETHNICITY AND AGE




DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

**Total Population of Block Groups**
**Dublin, California**

**Population Count by TAZ**

- 3 - 323
- 324 - 495
- 496 - 632
- 633 - 1,030
- 1031 - 4,347
- Dublin City Limits

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




0 1 Mile

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

**Population by TAZ**
**Dublin, California**

**Percentage of Minority Race/Ethnicity Population by Block Group**

- <40%
- 40% - 50%
- 51% - 60%
- 61% - 70%
- >70%

**Key Land Uses**

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




H:\24\24392 - Dublin ATP\gis\Task 3\MX Demo Minority Population.mxd 6/19/2020

0 1 Mile

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

**Minority Race/Ethnicity Population**
**Dublin, California**

## Percentage Under Age 18 by Block Group

- <10%
- 10% - 15%
- 16% - 20%
- 21% - 25%
- >25%

## Key Land Uses

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




0 1 Mile

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

**Population Under Age 18**
**Dublin, California**

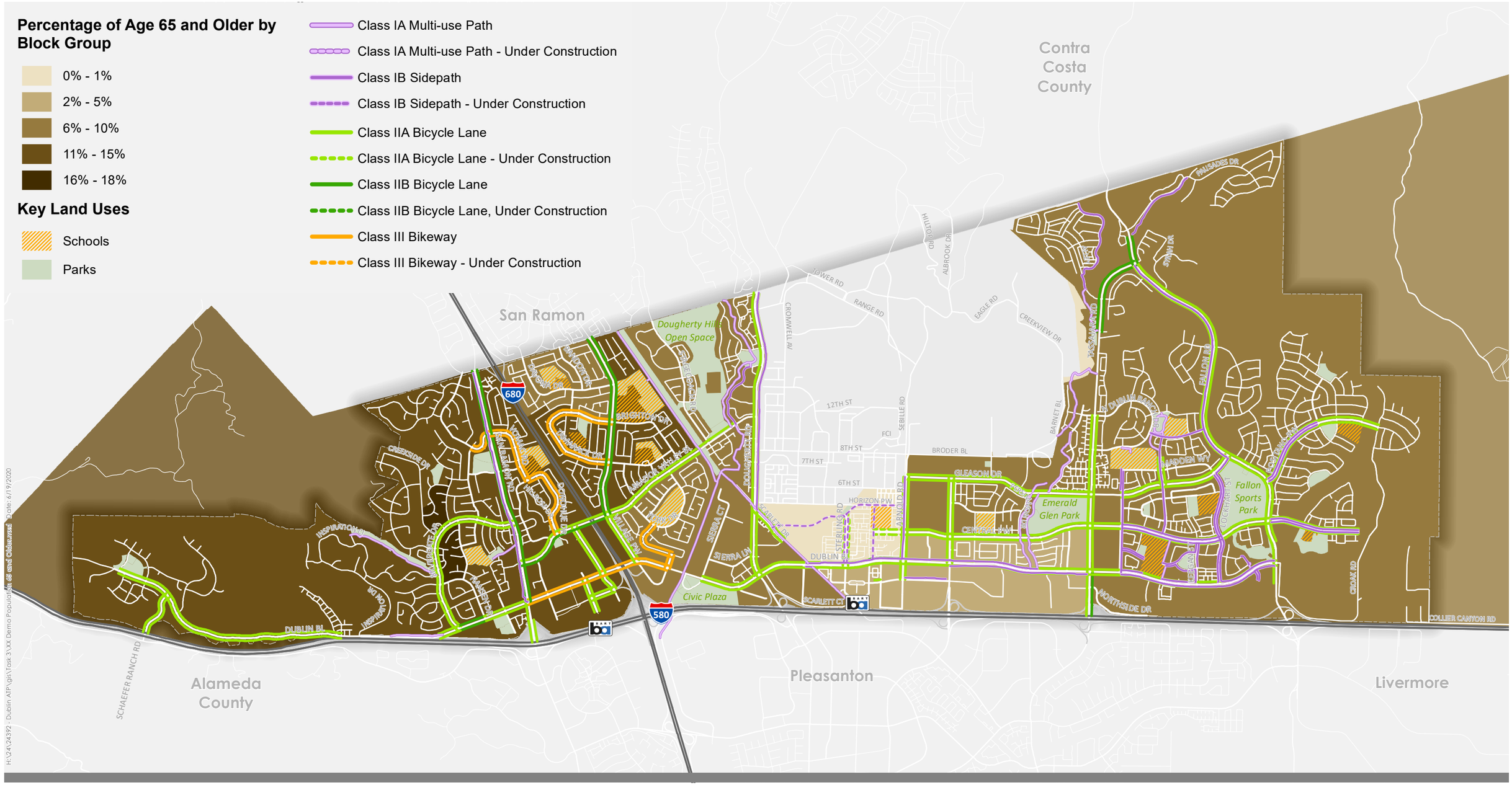
## Percentage of Age 65 and Older by Block Group

- 0% - 1%
- 2% - 5%
- 6% - 10%
- 11% - 15%
- 16% - 18%

## Key Land Uses

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




0 1 Mile

DUBLIN CALIFORNIA

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**Population Ages 65 and Older**
**Dublin, California**



H:\2A\24392 - Dublin ATP\gis\Task 3\XX Demo Population 65 and Older.mxd Date: 6/19/2020

# MAP PACKAGE
# WORKERS – COMMUTE MODES AND TIMES




H:\24\24392 - Dublin ATP\gis\Task 3\XX Demo Overview\Number of Workers per Block Group.mxd Date: 6/19/2020

DUBLIN
CALIFORNIA

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**Number of Workers per Block Group**
**Dublin, California**

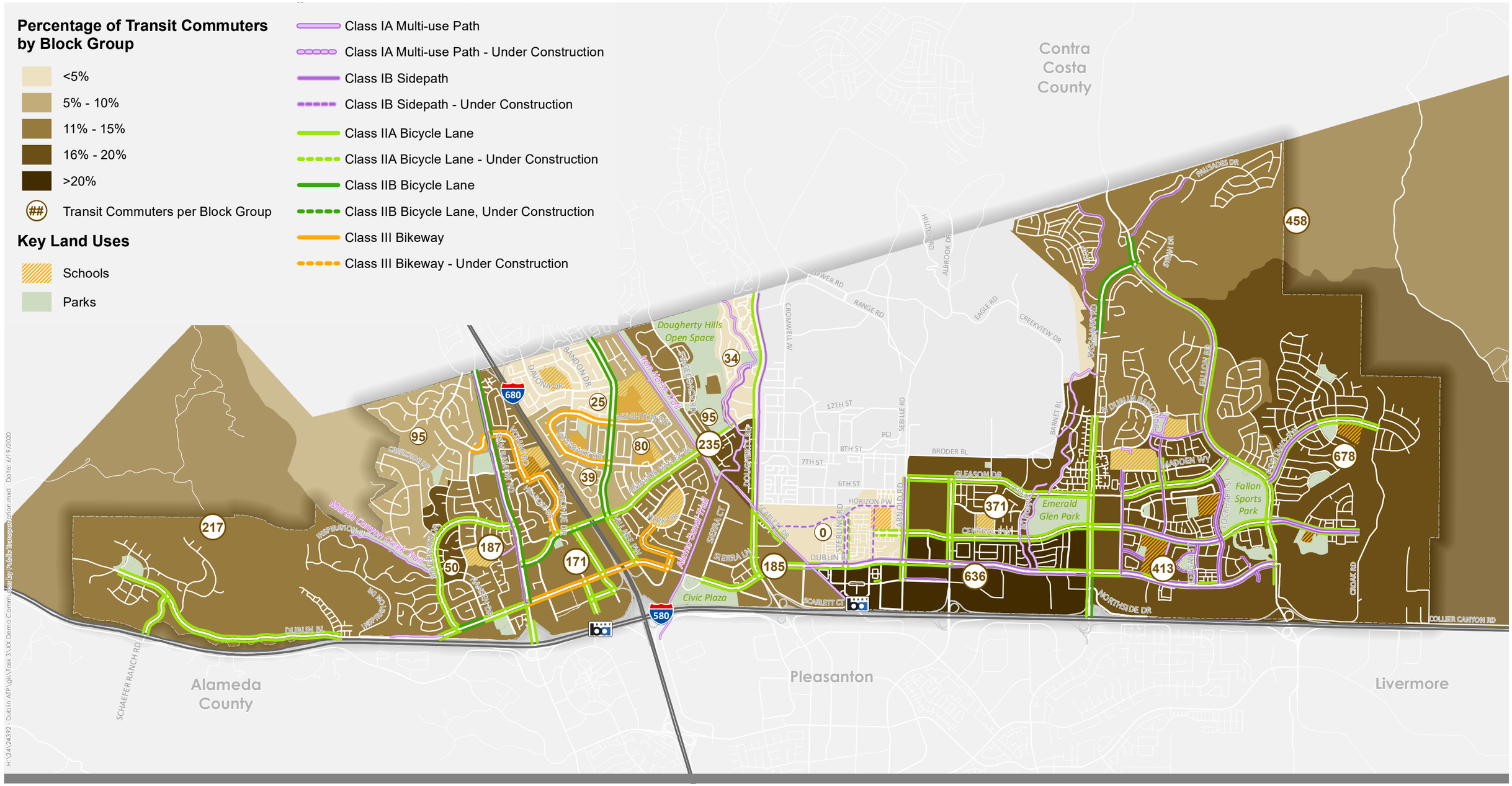
## Percentage of Transit Commuters by Block Group

- <5%
- 5% - 10%
- 11% - 15%
- 16% - 20%
- >20%
- (##) Transit Commuters per Block Group

## Key Land Uses

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




0 1 Mile

DUBLIN CALIFORNIA

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**Commuters by Public Transportation**
**Dublin, California**



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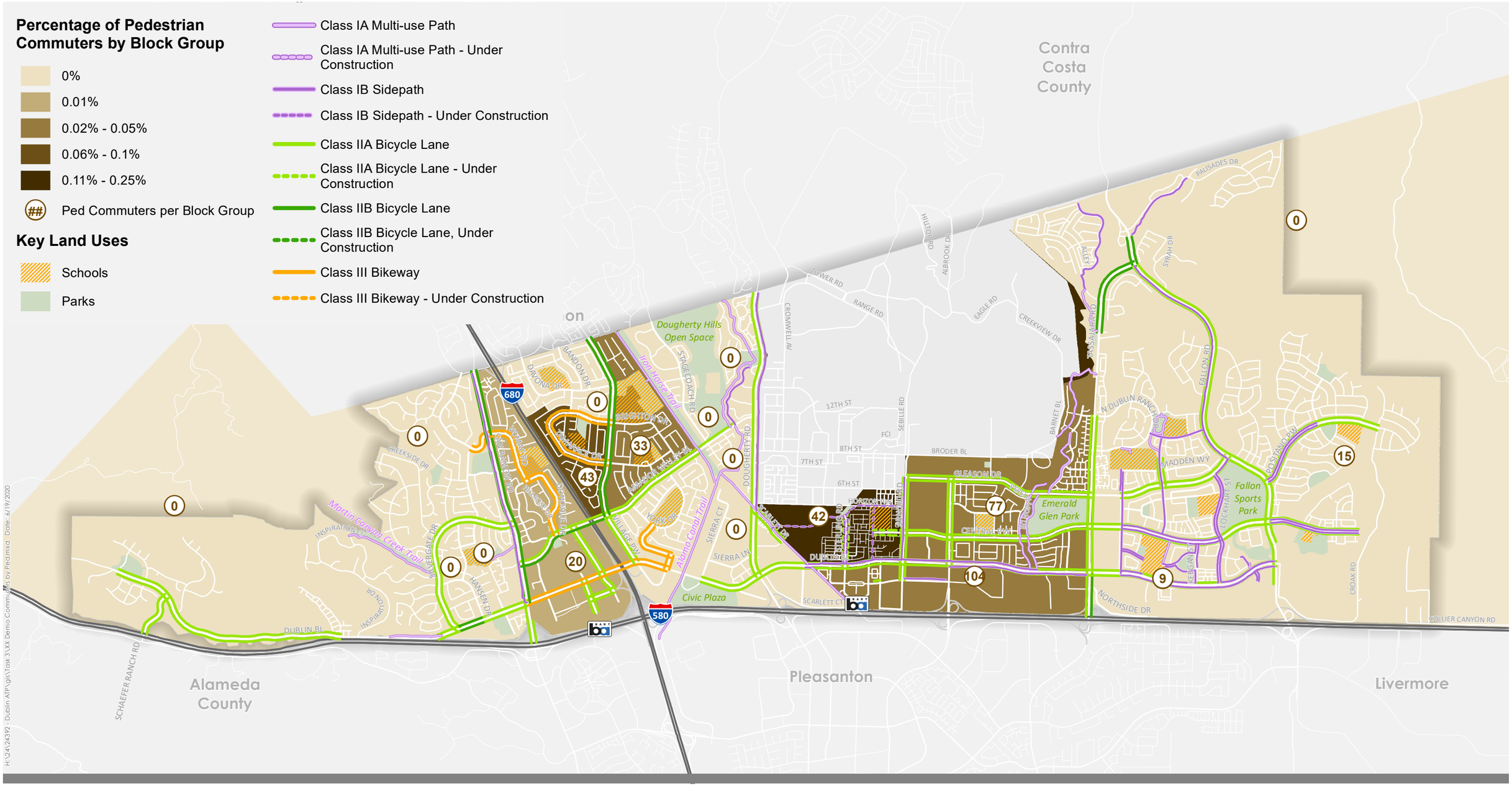
## Percentage of Pedestrian Commuters by Block Group

- 0%
- 0.01%
- 0.02% - 0.05%
- 0.06% - 0.1%
- 0.11% - 0.25%
- ## Ped Commuters per Block Group

## Key Land Uses

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




0 1 Mile

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

**Pedestrian Commuters**
**Dublin, California**



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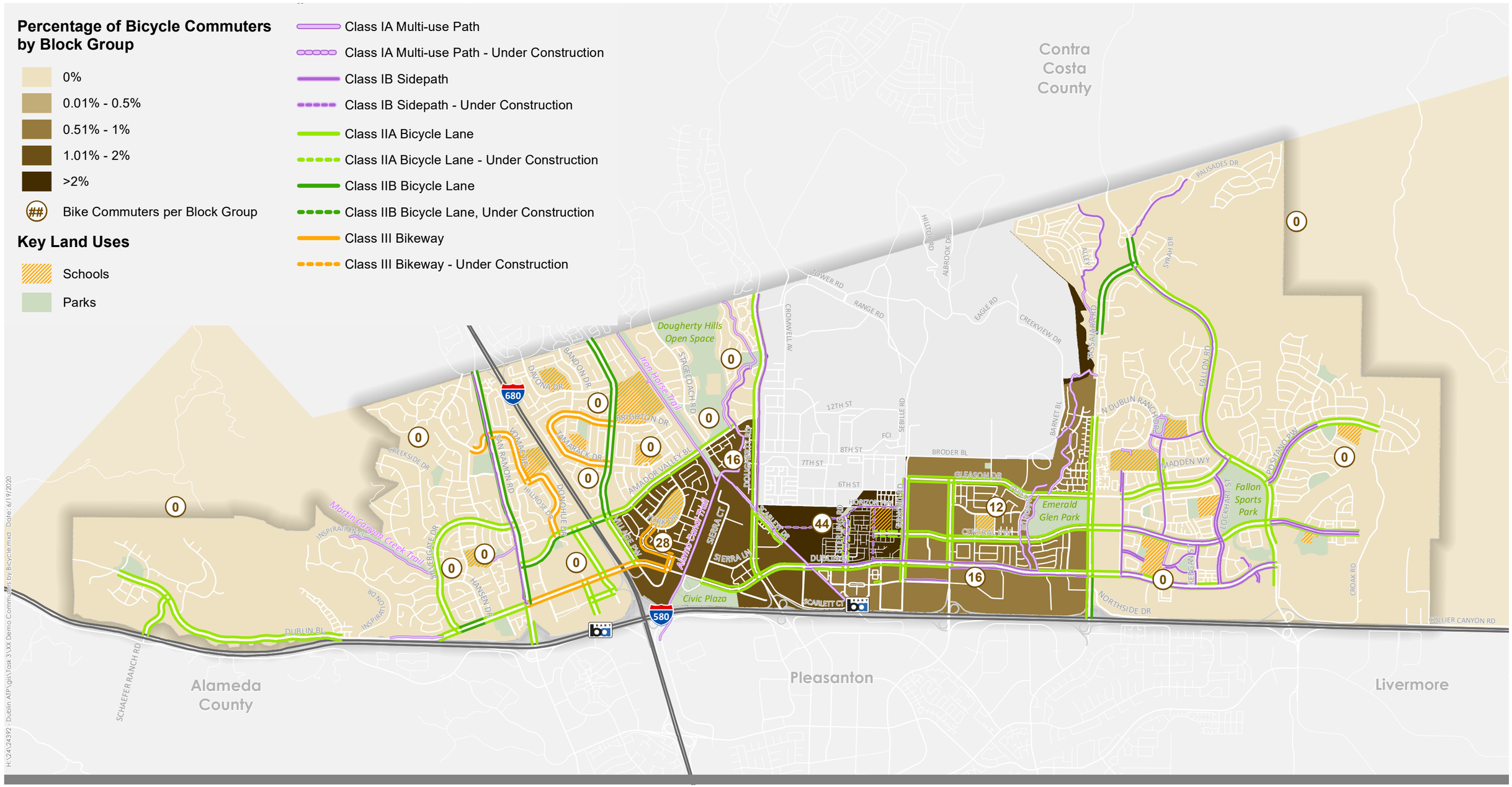
## Percentage of Bicycle Commuters by Block Group

- 0%
- 0.01% - 0.5%
- 0.51% - 1%
- 1.01% - 2%
- >2%
- ## Bike Commuters per Block Group

## Key Land Uses

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




0 1 Mile

DUBLIN CALIFORNIA

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**Commuters by Bicycle**
**Dublin, California**



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**Percentage of Commuter Travel Times Greater than 30 Minutes by Block Group**

- <1%
- 1% - 10%
- 10.1% - 25%
- 25.1% - 50%
- >50%

**Key Land Uses**

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction



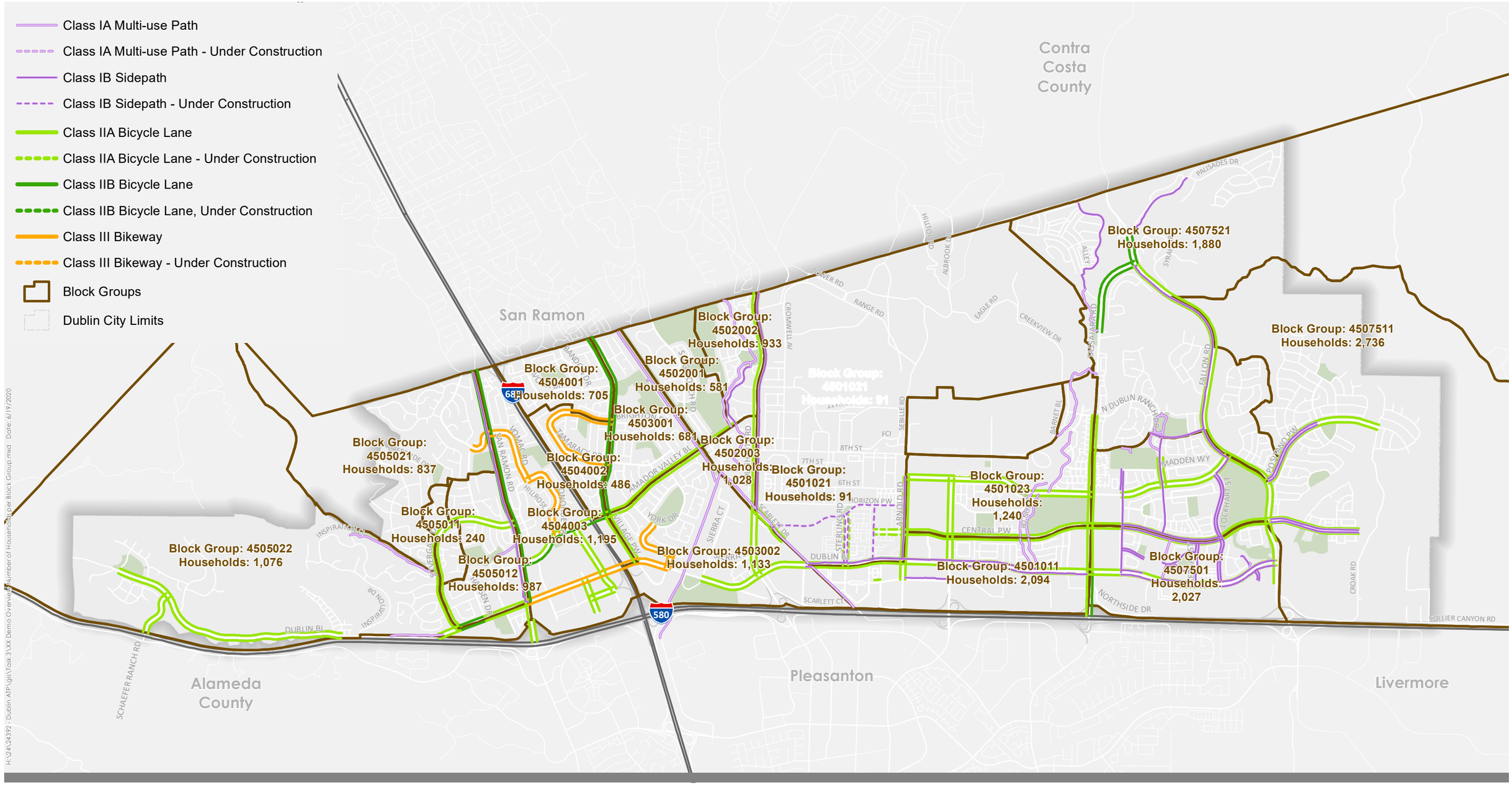

H:\2A\24392 - Dublin ATP\gis\Task 3\XX Demo Commuter Travel Times Greater than 30 Minutes.mxd Date: 6/19/2020

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

**Commuter Travel Times Greater than 30 Minutes**
**Dublin, California**

# MAP PACKAGE
# HOUSEHOLDS – INCOME, VEHICLES, AND HEALTH




DUBLIN CALIFORNIA

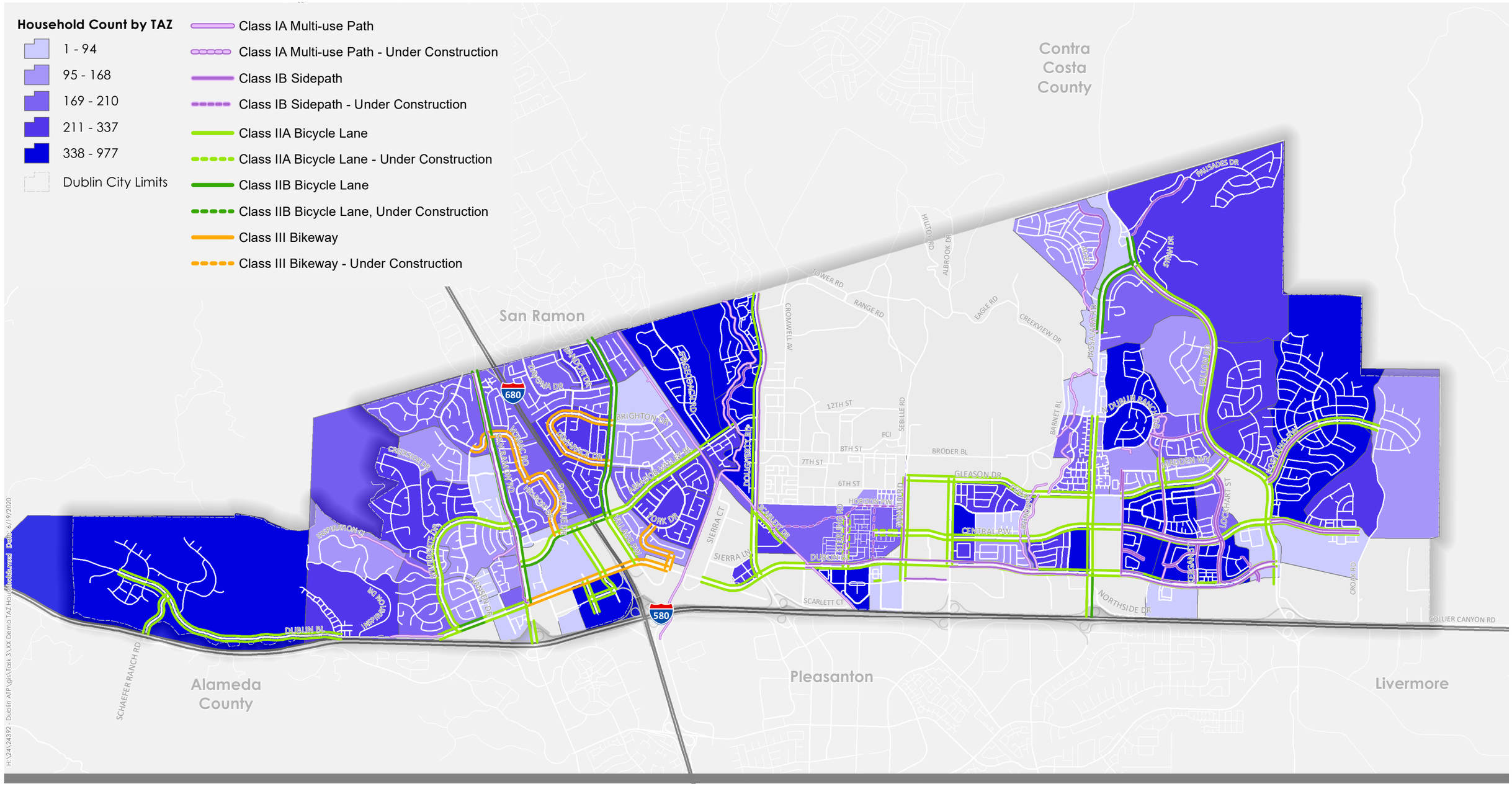
KITTELSON & ASSOCIATES

**Number of Households per Block Group**
**Dublin, California**

**Household Count by TAZ**

- 1 - 94
- 95 - 168
- 169 - 210
- 211 - 337
- 338 - 977
- Dublin City Limits

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




H:\24\24392 - Dublin ATP\gis\Task 3\XX Demo TAZ Households Data - 6/19/2020

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

**Households by TAZ**
**Dublin, California**

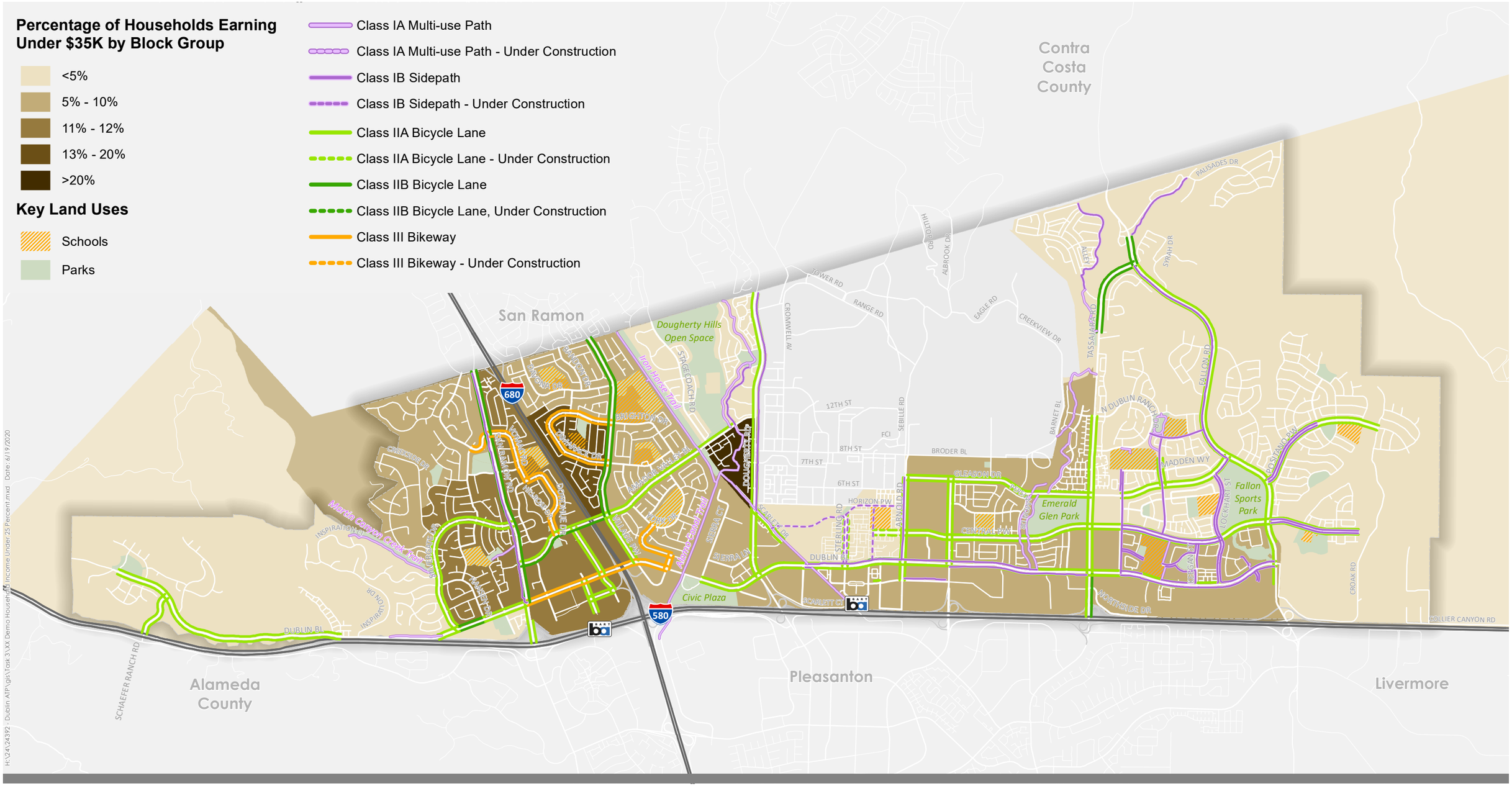
**Percentage of Households Earning Under $35K by Block Group**

- <5%
- 5% - 10%
- 11% - 12%
- 13% - 20%
- >20%

**Key Land Uses**

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

**Household Income Under 25% of City Median Income**
**Dublin, California**



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## Percentage of Households Earning $35K - $75K by Block Group

- 5%
- 6% - 10%
- 11% - 15%
- 16% - 20%
- >20%

## Key Land Uses

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




0 1 Mile

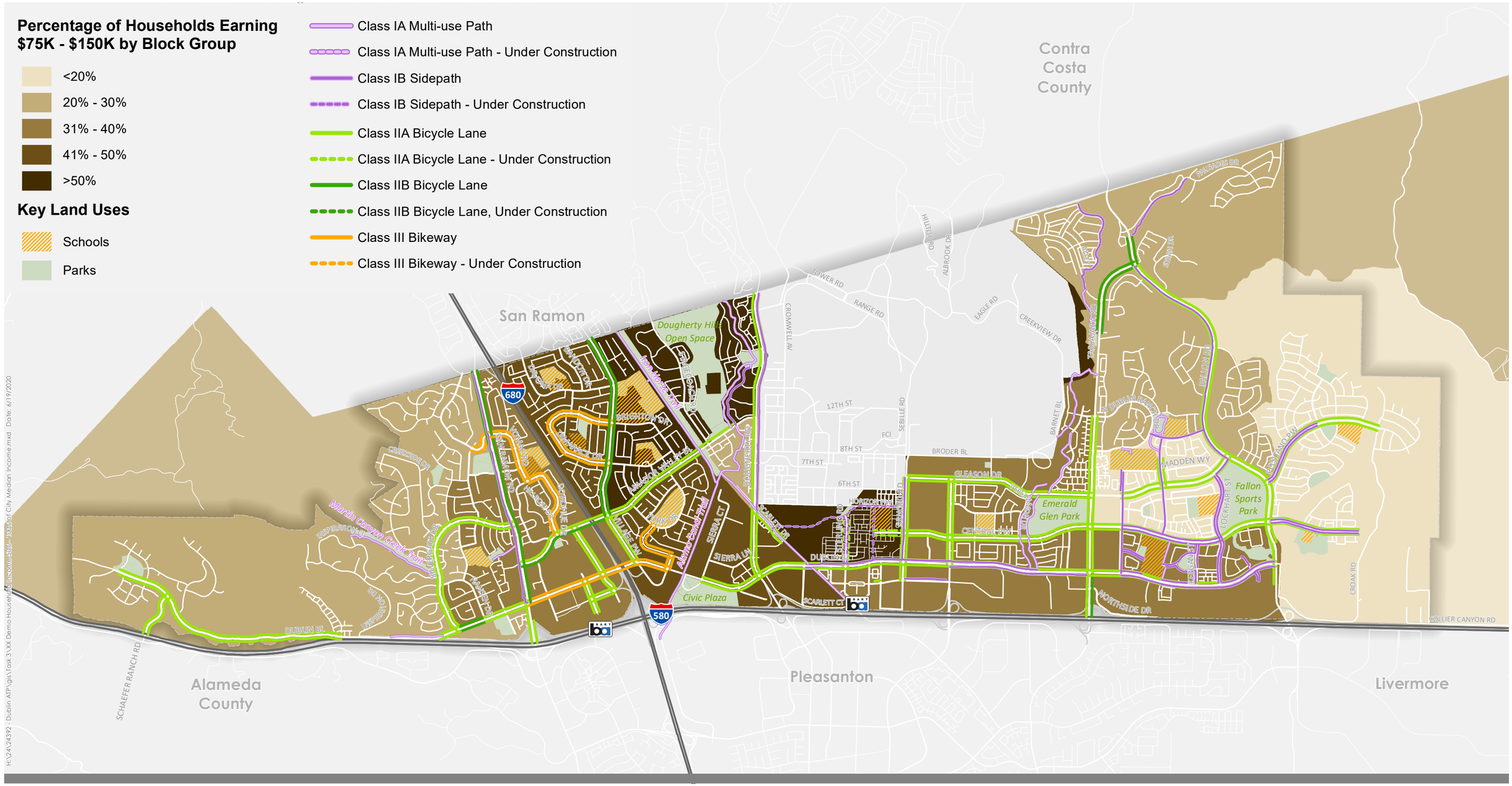
DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

**Household Income 25% - 50% of City Median Income**
**Dublin, California**



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DUBLIN
CALIFORNIA

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**Household Income 50% - 100% of City Median Income**
**Dublin, California**

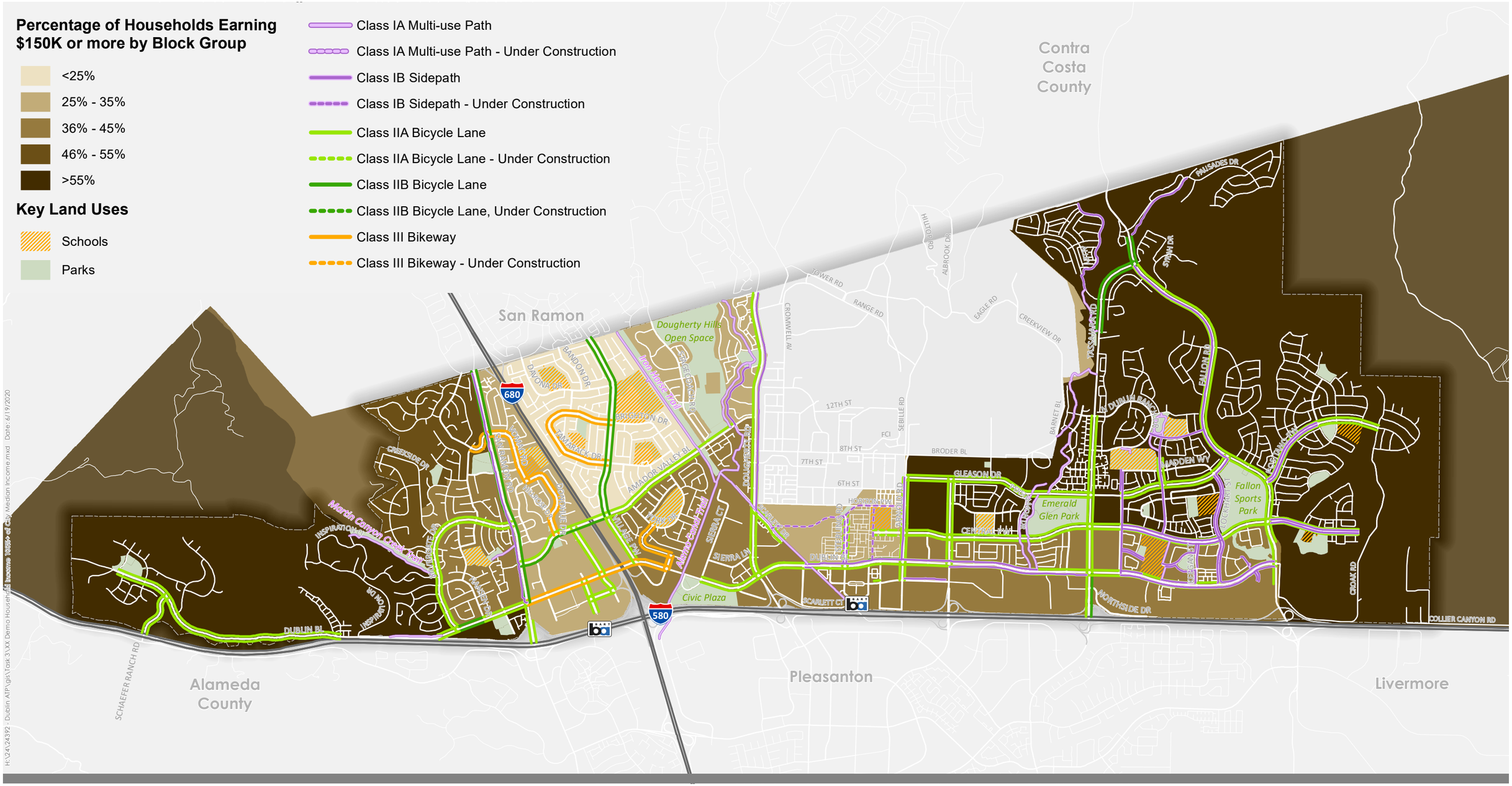
**Percentage of Households Earning $150K or more by Block Group**

- <25%
- 25% - 35%
- 36% - 45%
- 46% - 55%
- >55%

**Key Land Uses**

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




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DUBLIN CALIFORNIA

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**Household Income 100%+ of City Median Income**
**Dublin, California**

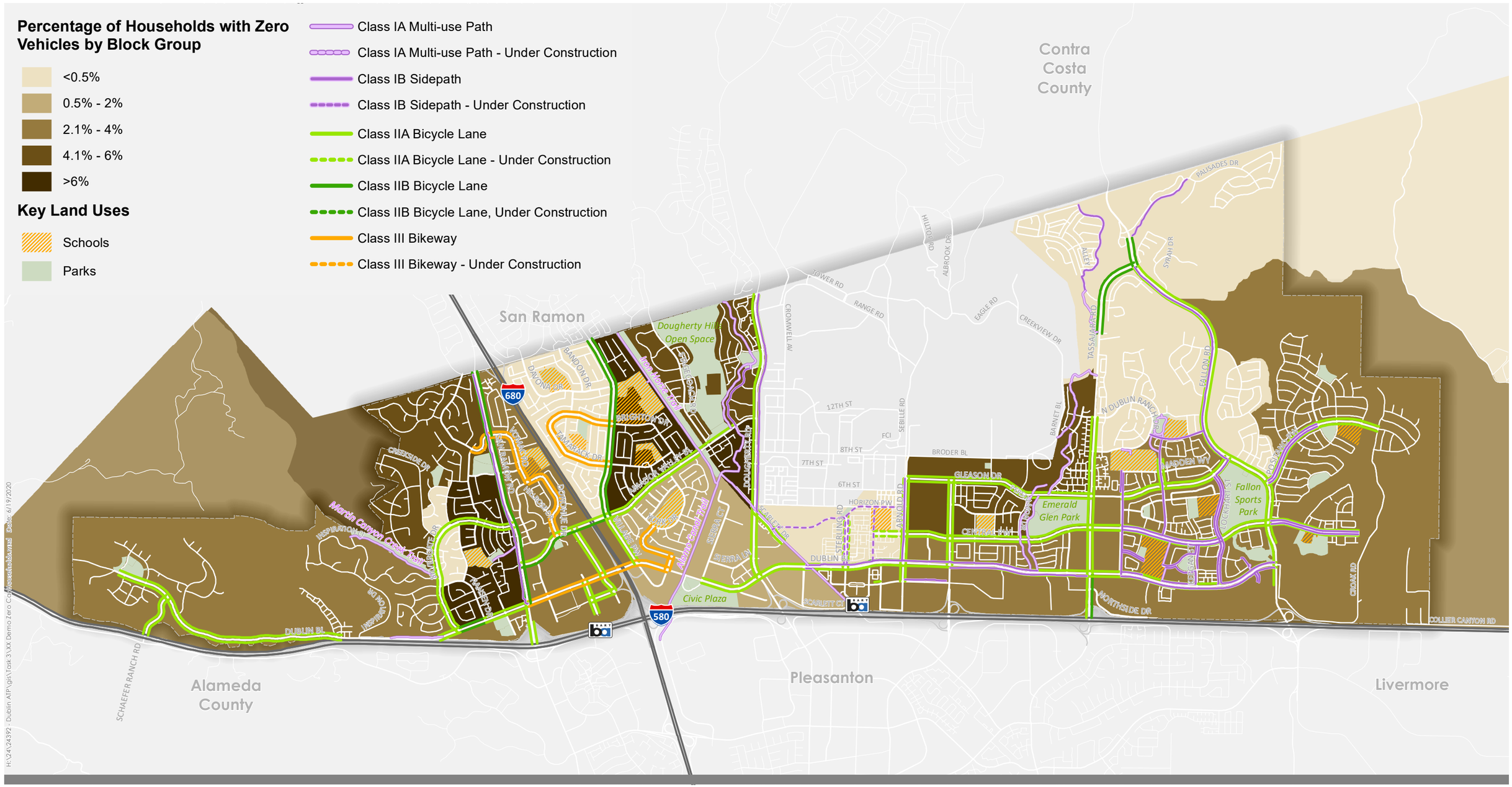
**Percentage of Households with Zero Vehicles by Block Group**

- <0.5%
- 0.5% - 2%
- 2.1% - 4%
- 4.1% - 6%
- >6%

**Key Land Uses**

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




0 1 Mile

DUBLIN CALIFORNIA

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**Zero Car Households**
**Dublin, California**



Date: 6/19/2020
H:\24\24392 - Dublin ATP\gis\Task 3\XX Demo Zero Car Households.mxd

## CalEnviroScreen

- 1 - 10% (Least Disadvantaged)
- 11 - 20%
- 21 - 30%
- 31 - 40%

## Key Land Uses

- Schools
- Parks

- Class IA Multi-use Path
- Class IA Multi-use Path - Under Construction
- Class IB Sidepath
- Class IB Sidepath - Under Construction
- Class IIA Bicycle Lane
- Class IIA Bicycle Lane - Under Construction
- Class IIB Bicycle Lane
- Class IIB Bicycle Lane, Under Construction
- Class III Bikeway
- Class III Bikeway - Under Construction




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DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

**CalEnviroScreen**
**Dublin, California**

# APPENDIX B

# EXISTING CONDITIONS: COLLISION ANALYSIS & HIGH INJURY NETWORK

KITTELSON & ASSOCIATES
155 GRAND AVENUE, SUITE 900
OAKLAND, CA 94612
P 510.839.1742 F 510.839.0871

# MEMORANDUM

Date: June 22, 2020 Project #: 24392

To: Sai Midididdi, TE
City of Dublin

From: Amanda Leahy, AICP; Mike Alston, RSP; Michael Sahimi, AICP; Erin Ferguson, PE, RSP

Project: Dublin Bicycle and Pedestrian Master Plan

Subject: Task 3.3.2 Safety Analysis – Trends and High Injury Network Mapping

Kittelson & Associates, Inc. (Kittelson) is assisting the City of Dublin (City) to update the Dublin Bicycle and Pedestrian Master Plan (Plan). This memorandum documents the methodology used for identifying the City's draft high injury network (HIN) as part of Task 3.3.2 - Safety Analysis. It is organized into the following sections:

- Data Sources
- Scope of Analysis and Approach to Analysis
- Citywide Collision Trends
- High Injury Network Maps

This analysis is intended to identify exclusively collision history and trends. The results of this analysis will serve as an input to the forthcoming prioritization framework (Task 4.1) and network recommendations (Task 4.2). Related information, like the presence of schools or vulnerable populations, will be layered alongside this quantitative analysis in the prioritization work.

## DATA SOURCES

Kittelson obtained the six most recent years of reported collision data involving bicyclists and pedestrians from the City's CrossRoads collision database, representing 2014 through 2019. Kittelson checked collision totals against the University of California, Berkeley, Transportation Injury Mapping System (TIMS) database and ensured that collisions were not double-counted based on collision locations, dates, and other attributes. Kittelson also used a County of Alameda centerline file to develop the roadway network used for analysis. This network was previously reviewed by the City to confirm roadways and functional classification designations.

# SCOPE OF ANALYSIS AND APPROACH TO ANALYSIS

## Collisions

The analysis included pedestrian and bicycle collisions of all severity levels, in descending order of severity: fatal, severe injury, other visible injury, complaint of pain injury, and property damage only (PDO). A collision is classified based on the most severe outcome among any parties involved in the collision.

Collisions were geocoded to the subject intersections or the relevant locations along roadways based on the information provided in the collision database. Collisions within 250 feet of an intersection were spatially located to the relevant intersection, and collisions listed as occurring greater than 250 feet from an intersection (as measured from the center of the intersection) were manually moved to the distance listed from the intersection.

## Street Network

The analysis evaluated collisions that occurred on public streets within the City, excluding freeway mainlines (e.g., Interstates 580 and 680) but included ramp terminal intersections of freeways.

## Analysis Steps

The following steps describe the basic analysis approach to identifying the HIN.

1. Establish the HIN database (collisions and roadway network) as described above.
2. Evaluate the frequency and severity of reported collisions using Equivalent Property Damage Only (EPDO, also known as collision severity score) screening and sliding window methodology from the *Highway Safety Manual* with severity weighting consistent with the Alameda CTC Countywide Active Transportation Plan (specifics of this methodology described below).
3. Select approximately the top 10 percent of roadways based on collision severity scores to be included in the HIN.
4. Where applicable, extend gaps between portions of the identified HIN provided the roadway characteristics are uniform.

Steps 2 through 4 were conducted separately for pedestrian and bicycle collisions.

## Collision Severity Score

Kittelson used an equivalent property damage only (EPDO) performance measure, also known as a collision severity score, which assigns weighting factors to collisions by severity relative to property damage only (PDO) collisions. For this analysis, the following weights were assigned in concurrence with Alameda CTC:

- **Fatal and severe injury collisions:** 10 equivalent PDOs
- **Visual injury or complaint of pain (moderate and minor injury) collisions:** 5 equivalent PDOs
- **PDO collisions:** 1 equivalent PDO

The weighting factors intentionally weigh fatal and severe injuries equally to recognize that the difference between a severe injury collision versus a fatal collision are often more of a function of the individuals involved than the circumstances of the collision.

The collision severity score is calculated by multiplying each collision severity total by its associated weight and summing the results, using the following formula:

*Collision Severity Score = Fatal weight * # of fatal collisions + severe injury weight*
** # of severe injury collisions + other visible injury weight * # of other visible injury collisions*
*+ complaint of pain injury weight * # of complaint of pain injury weight collisions + PDO collisions*

The collision severity score is annualized by dividing the score by the number of years (six) of collision data used in the analysis.

## Resulting Network

Kittelson performed a network screening to calculate the collision severity score for half-mile sliding window segments throughout the City.

## Sliding Window Methodology

As part of geocoding the collision data, Kittelson implemented a Python script in ArcGIS. This script segmented the street network into one-half (1/2) of a mile segments, incrementing the segments by one-tenth (1/10) of a mile. The collision severity score was calculated per increment of each segment as the script "slides" along each street in the network. It includes intersections as part of the analysis. By evaluating individual road increments multiple times, the sliding window methodology minimizes inaccurate collision reporting locations and identifies the windows with the highest collision severity scores. This methodology helps to identify portions of roadways with the greatest potential for safety improvements. Kittelson aggregated the results, based on their collision severity scores and via visual inspection of the results, into continuous corridors that make up the draft HIN. This is consistent with the methodology for the analysis conducted as part of the Alameda CTC Countywide Active Transportation Plan.

## COLLISION TRENDS

Alongside the spatial analysis to identify pedestrian and bicycle high injury networks, available variables in the collision data were analyzed to identify any citywide trends. Pedestrian and bicycle collisions were analyzed separately for any trends based on the following characteristics:

- Temporal characteristics (time of day, day of week, seasonal, year over year)
- Lighting conditions
- Location characteristics (intersection versus segment collisions)
- Primary collision factors cited by reporting officers
- Age and gender of people walking and biking involved in collisions

Among those categories, key findings that could support further Plan update work are included below. Note that collisions involving people walking or biking are random and sparse; the relative size of each dataset—68 bicycle collisions and 81 pedestrian collisions over six years—limits the ability to find statistically valid trends. Nonetheless, the following trends may be indicative of conditions within the City.

### Location

Table 1 and Table 2 present pedestrian and bicycle collisions based on location and severity. As with the spatial analysis, intersection collisions are defined as those reported to have occurred within a 250-foot intersection influence area; all others are considered segment collisions. A majority of both pedestrian and bicycle collisions occurred at intersections, where there are more conflicts with motor vehicle traffic than at other locations along roadways.

**Table 1: Pedestrian Collisions by Location and Severity**

| Location | Fatal/Severe Injury Collisions | Other Collisions | Total Reported Collisions | Share of Total Reported |
|---|---|---|---|---|
| Intersection | 11 | 63 | 74 | 91% |
| Segment | 1 | 6 | 7 | 9% |
| **Total Reported** | **12** | **69** | **81** | **100%** |

Source: City of Dublin; Kittelson, 2020.

**Table 2: Bicycle Collisions by Location and Severity**

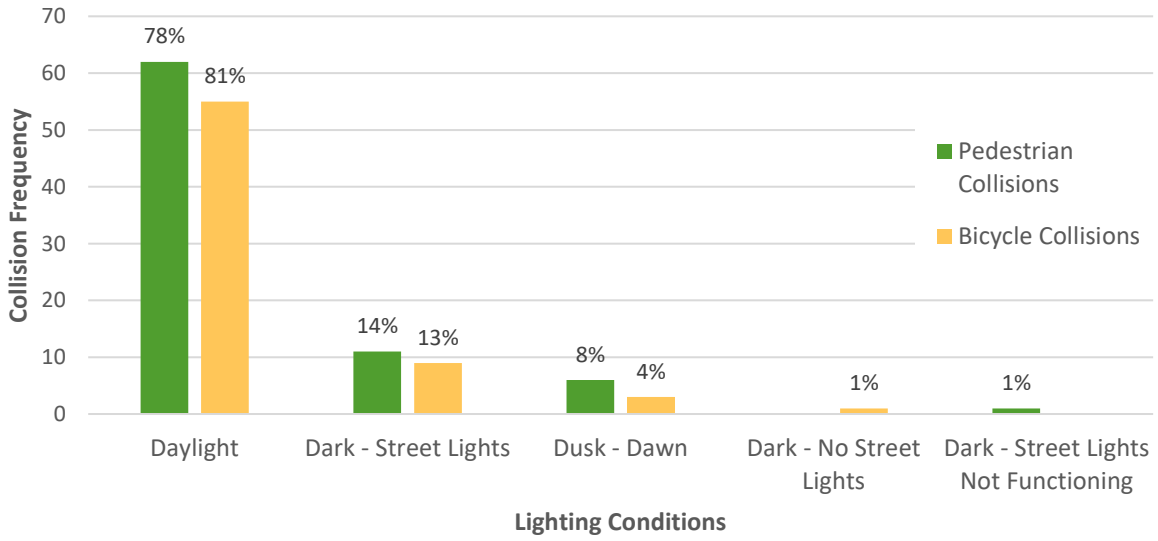
| Location | Fatal/Severe Injury Collisions | Other Collisions | Total Reported Collisions | Share of Total Reported |
|---|---|---|---|---|
| Intersection | 2 | 50 | 52 | 76% |
| Segment | 1 | 15 | 16 | 24% |
| **Total Reported** | **3** | **65** | **68** | **100%** |

Source: City of Dublin; Kittelson, 2020.

## Lighting

Figure 1 presents pedestrian and bicycle collisions by lighting conditions. The majority of such collisions occurred in daylight conditions. All reported bicycle fatal and severe injury collisions occurred in daylight conditions. In dark conditions, collisions primarily occurred under street lights.

**Figure 1: Pedestrian and Bicycle Collisions by Lighting Conditions**




Source: City of Dublin; Kittelson, 2020.

## Primary Collision Factors

Primary collision factors (PCFs) are aggregated and provided in the data based on the section of the California Vehicle Code the reporting officer records. Among bicycle collisions, the following primary collision factors were the most frequently cited:

- **Automobile right of way violation (26% of collisions):** a reported PCF that indicates one of several California Vehicle Violation codes regarding a failure to yield right-of-way to oncoming traffic. This PCF may be an action on the part of the bicyclist or the motorist involved.
- **Improper turning (16% of collisions):** a reported PCF that indicates a motorist committed a hazardous violation while turning.
- **Other hazardous movement (12% of collisions):** This is an aggregated violation category that can indicate a hazardous movement on the part of the bicyclist or the motorist involved.

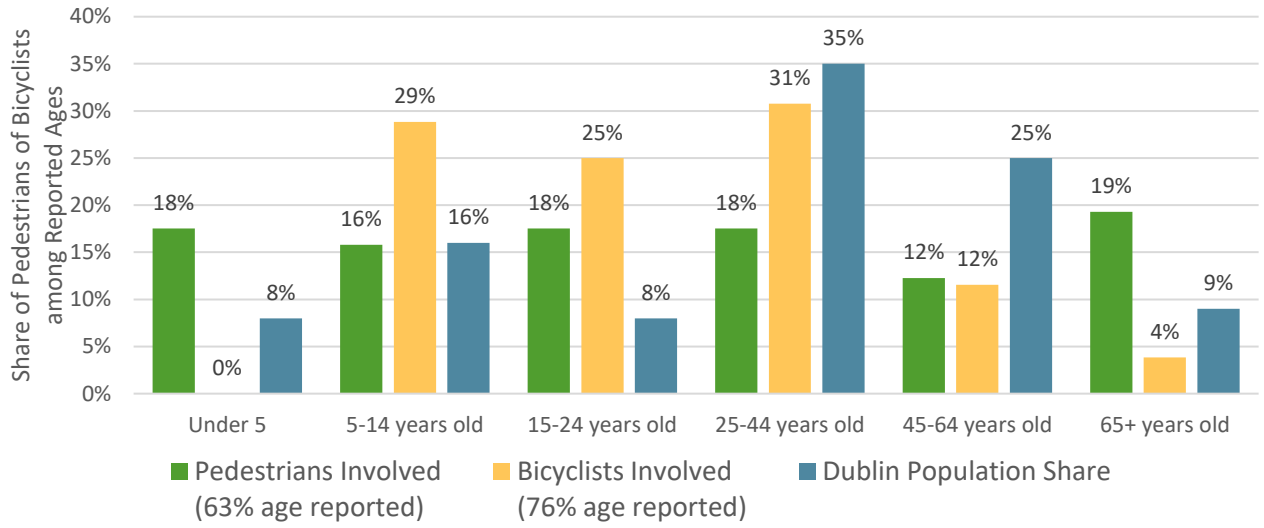
Among pedestrian collisions, the following PCFs were most frequently cited:

- **Pedestrian right-of-way violation (27% of collisions):** a reported PCF that indicates a driver violated a pedestrian's right-of-way.
- **Other improper driving (20% of collisions):** a PCF that represents an aggregation of motorist violations.
- **Automobile right-of-way violation (14% of collisions):** a reported PCF that indicates one of several California Vehicle Violation codes regarding a failure to yield right-of-way to oncoming traffic. This PCF would be an action on the part of the pedestrian or the motorist involved.
- **Pedestrian violation (6% of collisions):** a reported PCF that indicates a pedestrian was determined to have violated the laws regarding right-of-way.

## Age and Gender of Parties Involved

Figure 2 presents the ages of people walking or biking involved in collisions compared to the share of the City's population. Note that age data was available for 76% of pedestrians and for 63% of bicyclists involved in collisions. The comparison reveals that people between 15 to 24 years old appear overrepresented in bicycle and pedestrian collisions. They represent 25% and 18% of pedestrians and bicyclists involved in collisions, compared to eight percent of the City's population. Similarly, people between 45 and 64 years old are underrepresented among pedestrian and bicyclist collisions (12 percent each) relative to their share of Dublin's population (25 percent).

**Figure 2: Age of Parties Involved in Collisions**




Source: City of Dublin; Kittelson, 2020.

Additionally, reported gender was available for 78 percent of bicyclists involved in collisions and for 59 percent of pedestrians involved. The available data show that males represent approximately 60 percent of pedestrians involved in collisions and 83 percent of bicyclists involved in collisions.

## DELIVERABLES FROM THE ANALYSIS

The results from HIN and collision analysis are provided in the following attachments:

- **Figure 3: Pedestrian Collisions**
- **Figure 4: Pedestrian Network Screening Results**
- **Figure 5: Pedestrian High Injury Network**
- **Figure 6: Bicycle Collisions**
- **Figure 7: Bicycle Network Screening Results**
- **Figure 8: Bicycle High Injury Network**
- **Figure 9: Collision Statistics Infographic**

# HIGH INJURY NETWORK CHARACTERISTICS

## Draft High Injury Network Extents

Table 3 provides the extents of each draft high injury network.

**Table 3: Draft High Injury Network Roadways**

| **Pedestrian Draft High Injury Network** | | **Bicycle Draft High Injury Network** | |
|---|---|---|---|
| *Roadway* | *Extents* | *Roadway* | *Extents* |
| Amador Valley Boulevard | I-680 to Burton St | Amador Valley Boulevard | San Ramon Rd to Penn Dr |
| Arnold Drive | I-580 to Dublin Blvd | Dublin Boulevard | Silvergate Dr to Myrtle Dr |
| Bent Tree Drive | Fallon Dr to Sugar Hill Terr | Village Parkway | Dublin Blvd to City Limits (N) |
| Burton Street | Amador Valley Blvd to Tamarack Dr | | |
| Dublin Boulevard | Hansen Dr to Grafton St | | |
| Hacienda Drive | I-580 to Dublin Blvd | | |
| Regional Street | Southern extents to Amador Valley Blvd | | |
| Tamarack Drive | Canterbury Ln to Brighton Dr | | |
| Tassajara Road | Dublin Blvd to Gleason Dr | | |
| Village Parkway | Dublin Blvd to Davona Dr | | |
| **Total Mileage: 8.4 miles** | | **Total Mileage: 6.7 miles** | |

Source: City of Dublin; Kittelson, 2020.

## Draft High Injury Network Characteristics

Sixty-two percent of the pedestrian collisions occurred on the 8.4 miles of roadway that make up the pedestrian HIN. Sixty-two percent of the bicycle collisions occurred on the 6.7 miles of roadway that make up the bicycle HIN.

General road characteristics of the draft pedestrian HIN include the following:

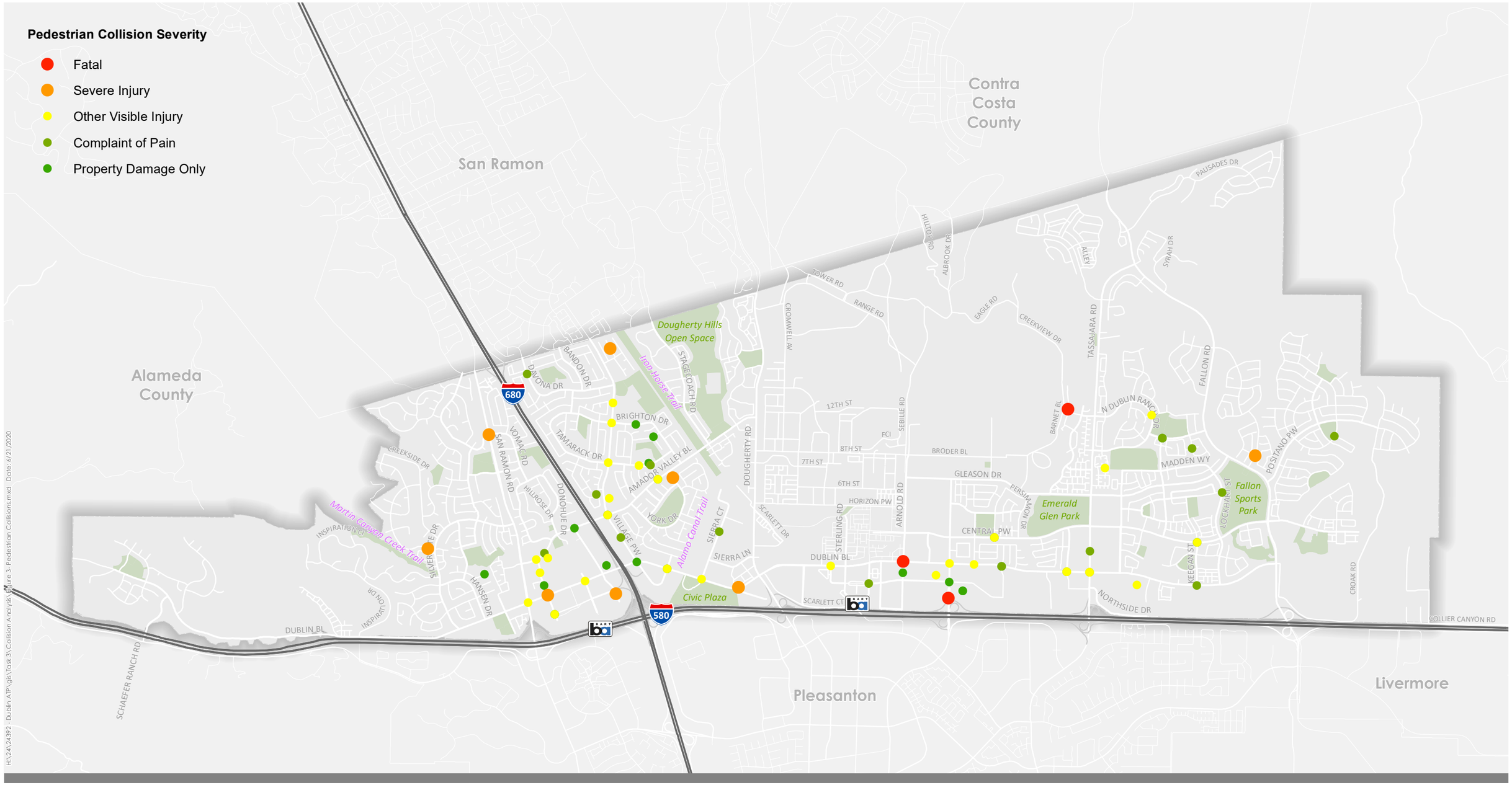
- Approximately 40 percent of the pedestrian HIN has a speed limit of 35 miles per hour; 32 percent of the HIN mileage consists of roads with speed limit of 40 or 45 miles per hour, and the remainder of the HIN has a speed limit of 25 or 30 miles per hour..
- Approximately 55 percent of the pedestrian HIN consists of roads classified as arterial roads, with the remainder being collector or residential streets.
- Approximately 47 percent of the HIN has five or six vehicular through lanes. Another 24 percent includes four vehicular through lanes, and the remainder of the HIN has two or three lanes.

General road characteristics of the draft bicycle HIN include the following:

- Approximately 78 percent of the bicycle HIN mileage consists of roads with speed limit of 35 or 45 miles per hour, with the remainder of the HIN having speeds limits of 30 miles per hour.
- The bicycle HIN is approximately evenly divided between arterial and collector roadways—54 and 46 percent, respectively.
- Approximately 88 percent of the HIN has four or more vehicular through lanes.

## NEXT STEPS

The pedestrian and bicycle HIN will be carried forward as inputs to the network prioritization (Task 4.1) as part of the next task, which will include other input elements upon consultation with the City not quantified here—for example, proximity to schools or demographic information. The descriptive statistics and HIN characteristics described will also be carried forward into subsequent Plan update work, including possible documentation for infrastructure design guidelines and network recommendations (Task 4.2).



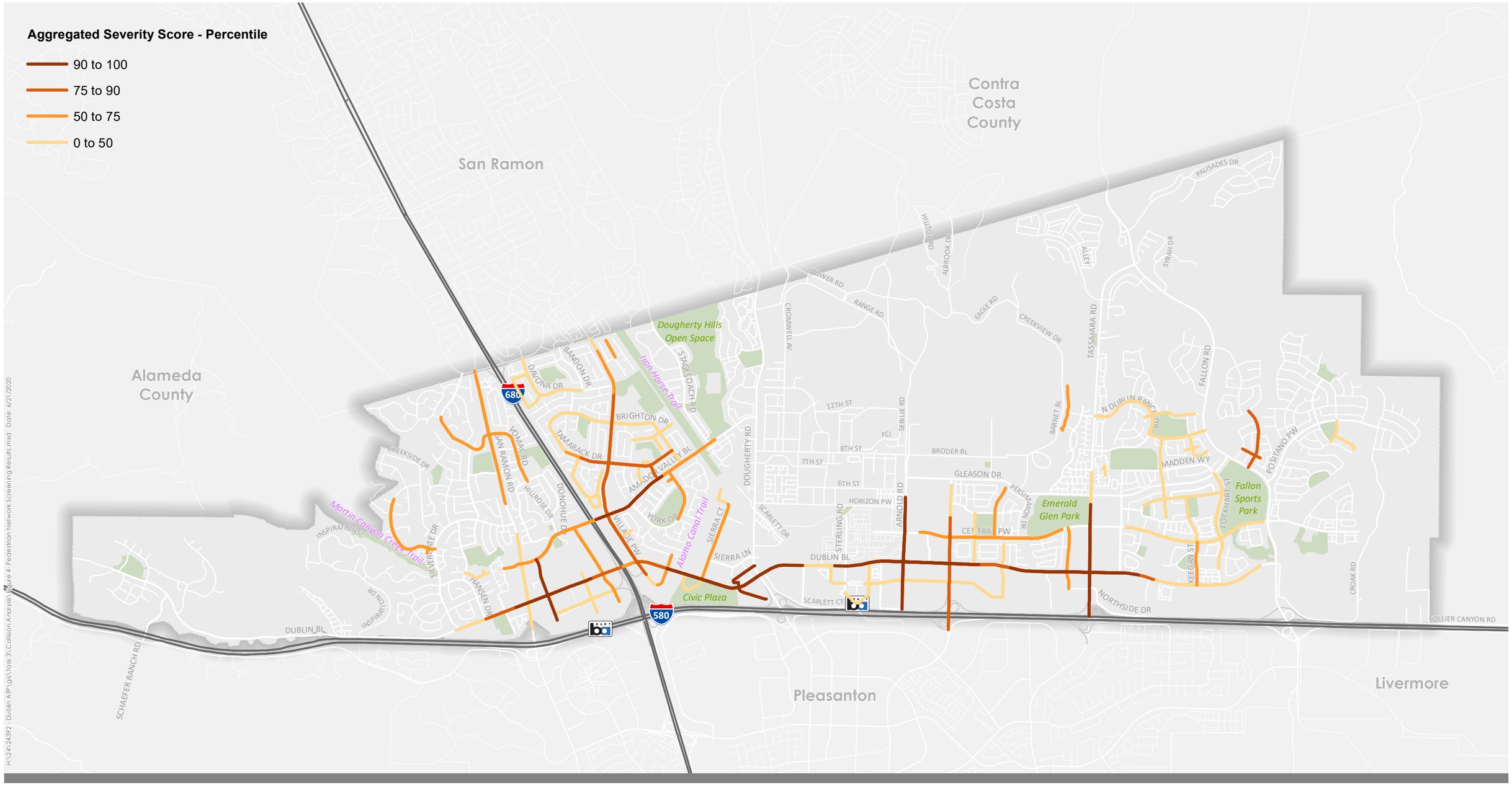

H:\24\24392 - Dublin ATP\gis\Task 3\Collision Analysis\Figure 3 Pedestrian Collisions.mxd Date: 6/21/2020

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure 3

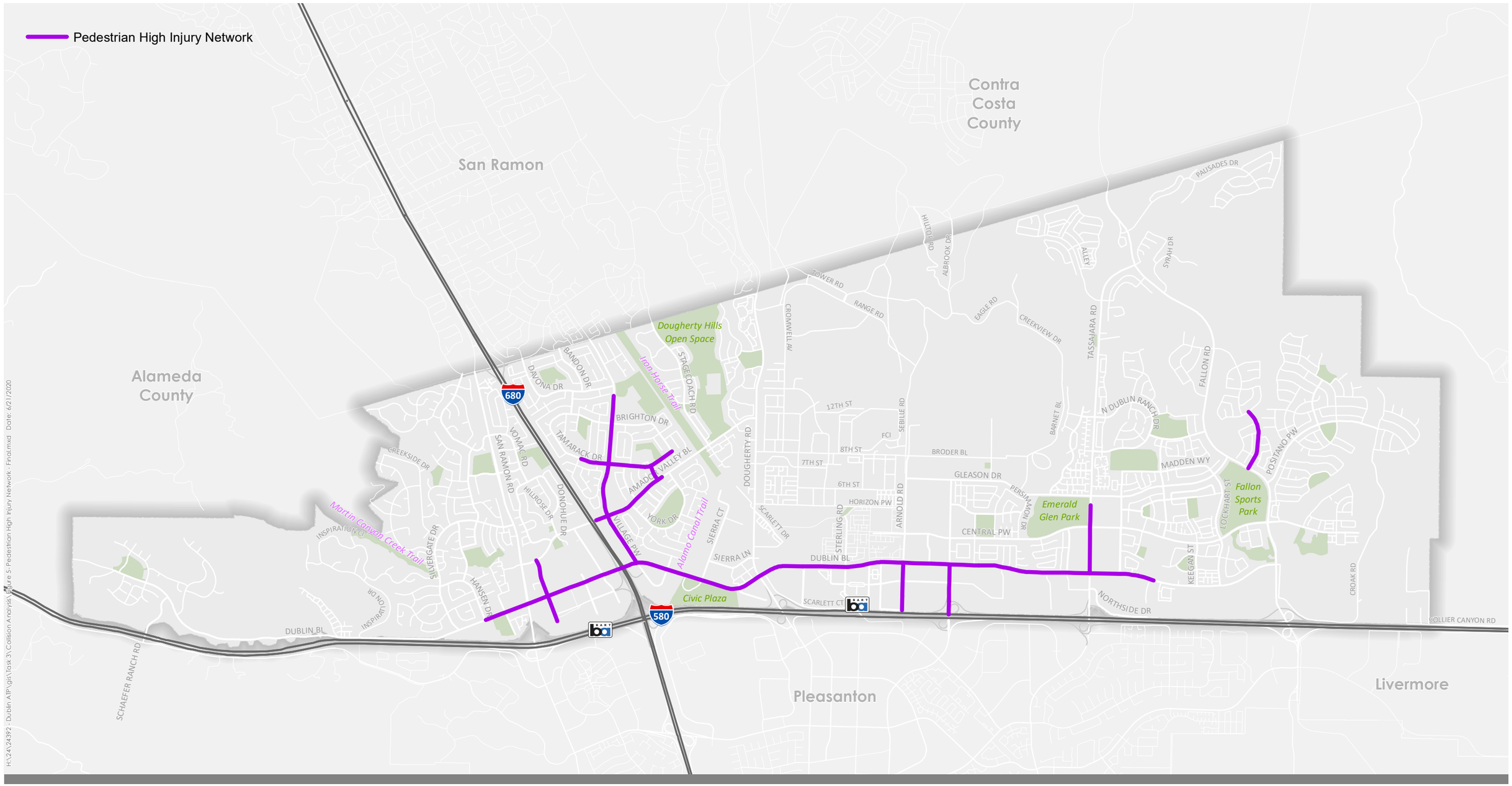
**Pedestrian Collisions (2014 - 2019)**
**Dublin, California**




H:\24\24392 - Dublin ATP\gis\Task 3\Collision Analysis\Figure 4 Pedestrian Network Screening Results.mxd Date: 6/21/2020

Figure 4

**Pedestrian Network Screening Results**
**Dublin, California**




0 1 Mile

H:\24\24392 - Dublin ATP\gis\Task 3\Collision Analysis\Figure 5-Pedestrian High Injury Network - Final.mxd Date: 6/21/2020

Figure 5

**Pedestrian High Injury Network**
**Dublin, California**

**Bicycle Collision Severity**

- Fatal
- Severe Injury
- Other Visible Injury
- Complaint of Pain
- Property Damage Only

San Ramon

Contra Costa County

Alameda County

Pleasanton

Livermore

Dougherty Hills Open Space

Iron Horse Trail

Martin Canyon Creek Trail

Alamo Canal Trail

Civic Plaza

Emerald Glen Park

Fallon Sports Park

680

580

BART

0 1 Mile

H:\24\24392 - Dublin ATP\gis\Task 3\Collision Analysis\Figure 6 - Bicycle Collisions.mxd Date: 6/21/2020

Figure 6

**Bicycle Collisions (2014 - 2019)**
**Dublin, California**

DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

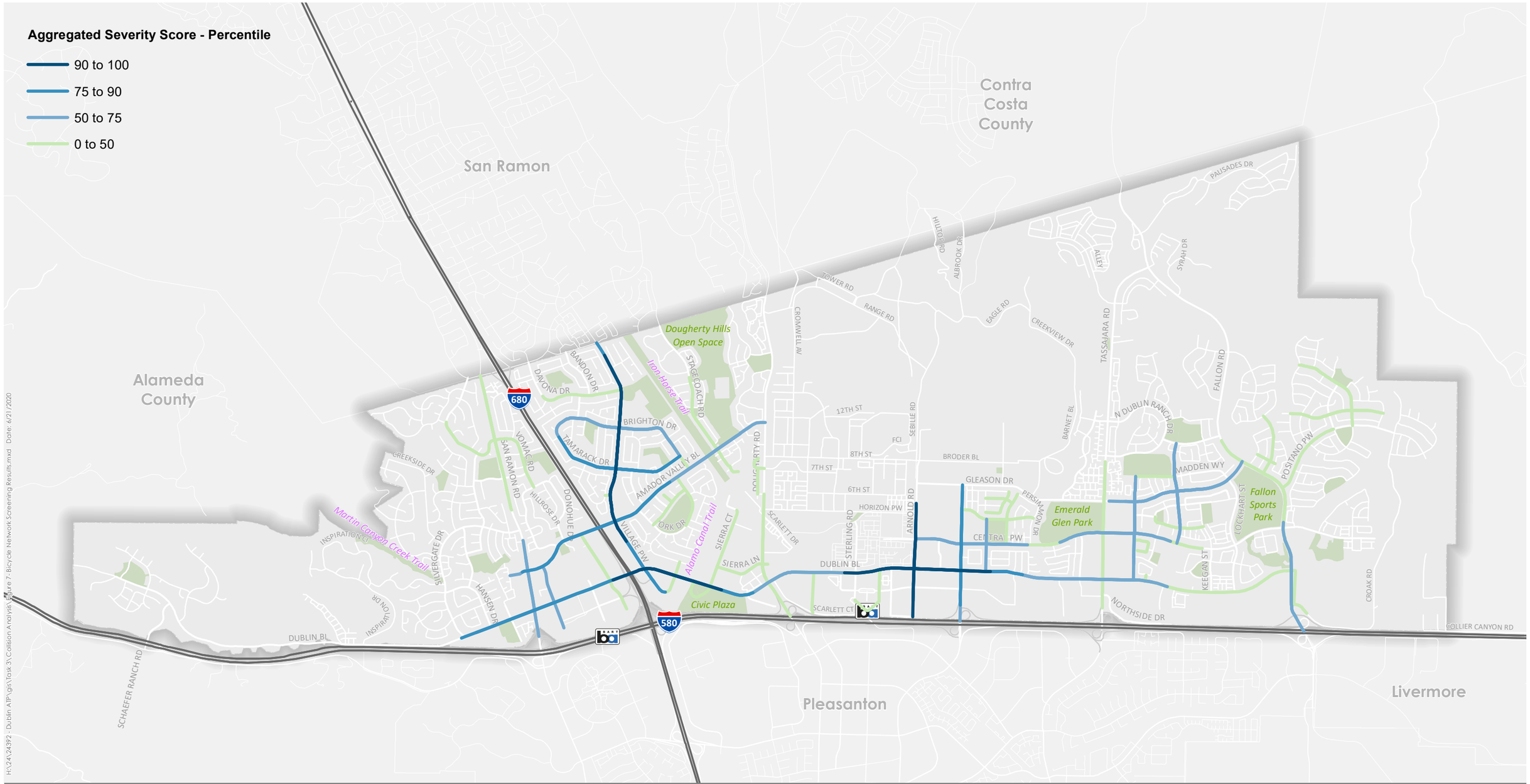
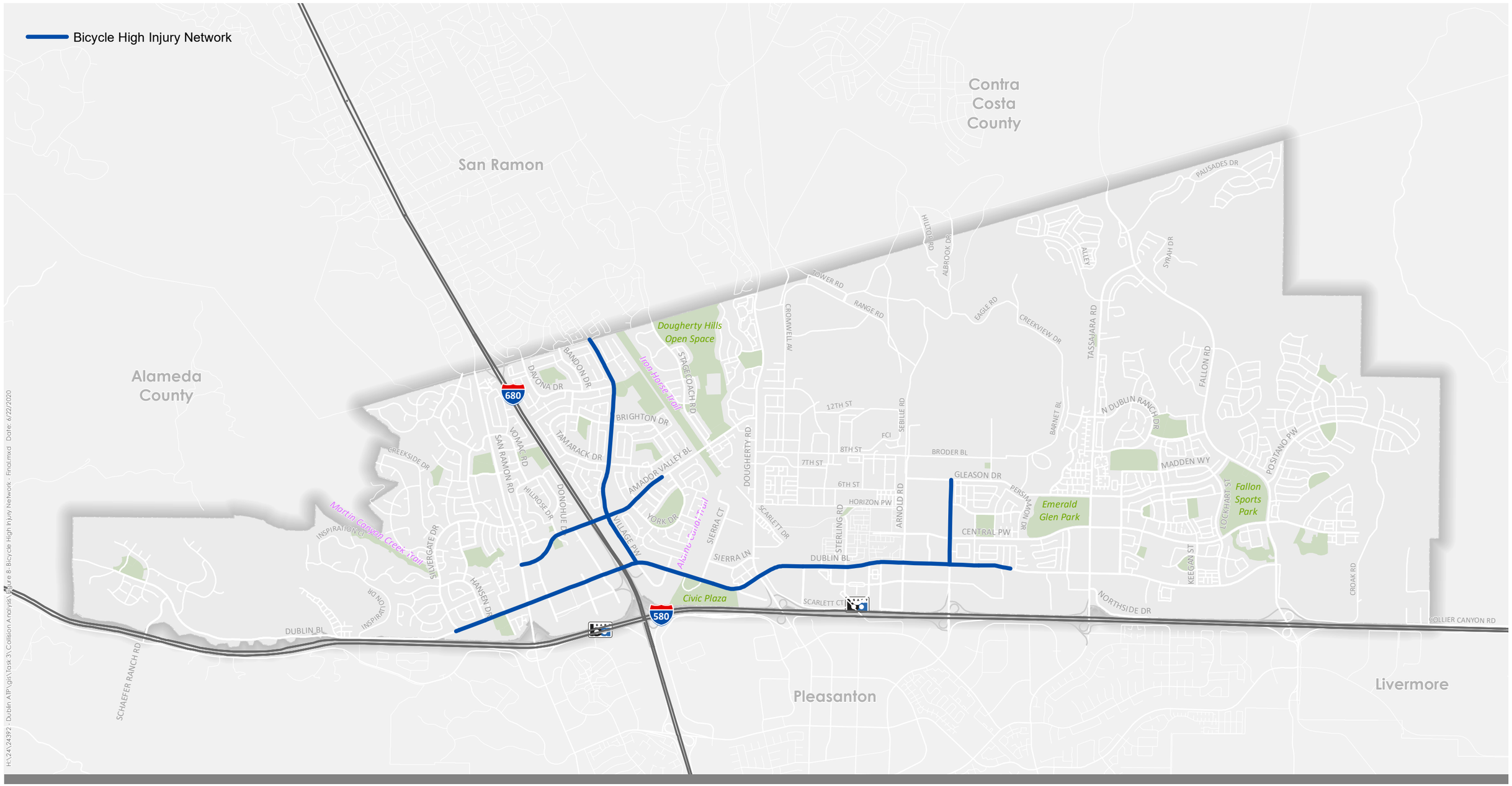



Figure 7

**Bicycle Network Screening Results**
**Dublin, California**




H:\24\24392 - Dublin ATP\gis\Task 3\Collision Analysis\Figure 8 Bicycle High Injury Network - Final.mxd Date: 6/22/2020

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

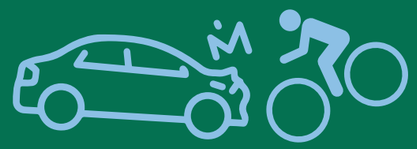
Figure 8

**Bicycle High Injury Network**
**Dublin, California**

**76%** of bike collisions occur at an intersection



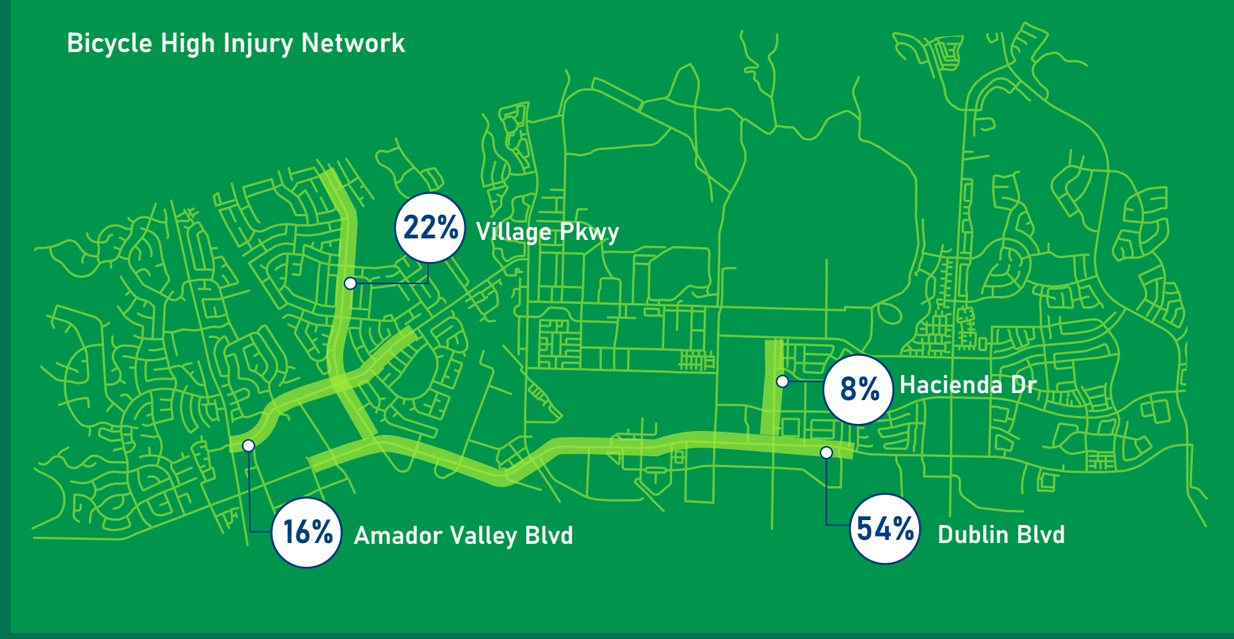
## THE TOP 2 CITED PRIMARY COLLISION FACTORS FOR BIKE COLLISIONS ARE:

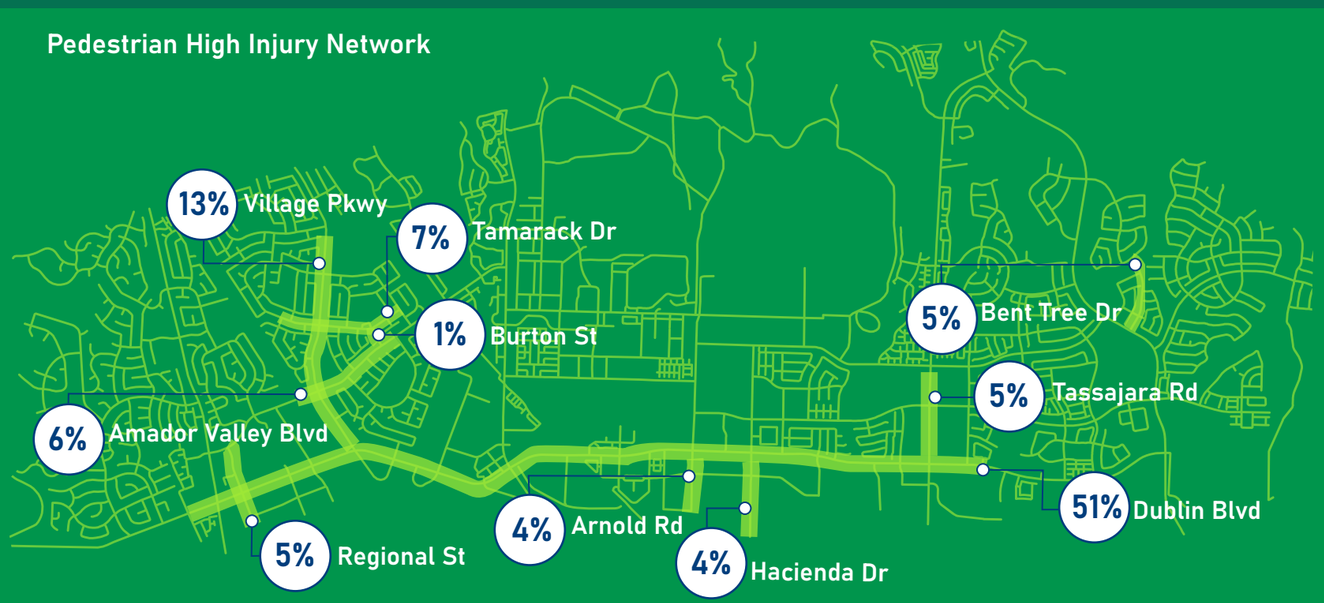


**26%** Automobile Right of Way Violation
(Failure to yield right-of-way to conflicting traffic)



**16%** Improper Turning




**4%** of bike collisions resulted in a fatality or severe injury





**91%** of pedestrian collisions occur at an intersection

**14%** of pedestrian collisions are hit and run collisions





**15%** of pedestrian collisions resulted in a fatality or severe injury

Attachment A: Network Screening Results

| FID | Street | Fatal Crashes | Severe Injury Crashes | Moderate Injury Crashes | Minor Injury Crashes | PDO Crashes | Total Crashes | Segment Length | Annualized EqPDO Score | Rank | Percentile | Percentile Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 623 | DUBLIN BL | 0 | 2 | 2 | 1 | 0 | 5 | 0.5 | 5.833333333 | 1 | 0.994444444 | 90_100 |
| 663 | DUBLIN BL | 1 | 0 | 3 | 1 | 0 | 5 | 0.5 | 5 | 2 | 0.988888889 | 90_100 |
| 1335 | REGIONAL ST | 0 | 1 | 3 | 0 | 3 | 7 | 0.402237 | 4.666666667 | 3 | 0.983333333 | 90_100 |
| 469 | DUBLIN BL | 0 | 0 | 4 | 1 | 1 | 6 | 0.5 | 4.333333333 | 4 | 0.977777778 | 90_100 |
| 491 | DUBLIN BL | 0 | 0 | 4 | 1 | 1 | 6 | 0.5 | 4.333333333 | 5 | 0.972222222 | 90_100 |
| 573 | DUBLIN BL | 0 | 0 | 4 | 1 | 1 | 6 | 0.5 | 4.333333333 | 6 | 0.966666667 | 90_100 |
| 710 | DUBLIN BL | 0 | 0 | 4 | 1 | 1 | 6 | 0.5 | 4.333333333 | 7 | 0.961111111 | 90_100 |
| 349 | DUBLIN BL | 1 | 0 | 2 | 1 | 0 | 4 | 0.5 | 4.166666667 | 8 | 0.955555556 | 90_100 |
| 386 | DUBLIN BL | 0 | 2 | 1 | 0 | 0 | 3 | 0.5 | 4.166666667 | 9 | 0.95 | 90_100 |
| 449 | DUBLIN BL | 0 | 2 | 1 | 0 | 0 | 3 | 0.5 | 4.166666667 | 10 | 0.944444444 | 90_100 |
| 718 | DUBLIN BL | 0 | 1 | 2 | 0 | 1 | 4 | 0.5 | 3.5 | 11 | 0.938888889 | 90_100 |
| 94 | ARNOLD RD | 1 | 0 | 1 | 1 | 1 | 4 | 0.5 | 3.5 | 12 | 0.933333333 | 90_100 |
| 202 | ARNOLD RD | 1 | 0 | 1 | 1 | 1 | 4 | 0.5 | 3.5 | 13 | 0.927777778 | 90_100 |
| 282 | ARNOLD RD | 1 | 0 | 1 | 1 | 1 | 4 | 0.5 | 3.5 | 14 | 0.922222222 | 90_100 |
| 147 | AMADOR VALLEY BL | 0 | 0 | 2 | 2 | 0 | 4 | 0.5 | 3.333333333 | 15 | 0.916666667 | 90_100 |
| 501 | DUBLIN BL | 1 | 0 | 1 | 1 | 0 | 3 | 0.5 | 3.333333333 | 16 | 0.911111111 | 90_100 |
| 672 | DUBLIN BL | 1 | 0 | 1 | 1 | 0 | 3 | 0.5 | 3.333333333 | 17 | 0.905555556 | 90_100 |
| 690 | DUBLIN BL | 1 | 0 | 1 | 1 | 0 | 3 | 0.5 | 3.333333333 | 18 | 0.9 | 90_100 |
| 1031 | TASSAJARA RD | 0 | 0 | 2 | 2 | 0 | 4 | 0.5 | 3.333333333 | 19 | 0.894444444 | 90_100 |
| 1164 | TASSAJARA RD | 0 | 0 | 2 | 2 | 0 | 4 | 0.5 | 3.333333333 | 20 | 0.888888889 | 90_100 |
| 1256 | TASSAJARA RD | 0 | 0 | 2 | 2 | 0 | 4 | 0.5 | 3.333333333 | 21 | 0.883333333 | 90_100 |
| 399 | DUBLIN CT | 0 | 2 | 0 | 0 | 0 | 2 | 0.1944855 | 3.333333333 | 22 | 0.877777778 | 90_100 |
| 583 | DUBLIN BL | 0 | 2 | 0 | 0 | 0 | 2 | 0.5 | 3.333333333 | 23 | 0.872222222 | 90_100 |
| 724 | DUBLIN BL | 0 | 2 | 0 | 0 | 0 | 2 | 0.5 | 3.333333333 | 24 | 0.866666667 | 90_100 |
| 1143 | TRALEE VILLAGE DR | 0 | 2 | 0 | 0 | 0 | 2 | 0.2343014 | 3.333333333 | 25 | 0.861111111 | 90_100 |
| 641 | DUBLIN BL | 0 | 0 | 2 | 1 | 2 | 5 | 0.5 | 2.833333333 | 26 | 0.855555556 | 75_90 |
| 339 | HACIENDA DR | 1 | 0 | 1 | 0 | 1 | 3 | 0.5 | 2.666666667 | 27 | 0.85 | 75_90 |
| 477 | DUBLIN BL | 0 | 0 | 2 | 1 | 1 | 4 | 0.5 | 2.666666667 | 28 | 0.844444444 | 75_90 |
| 485 | DUBLIN BL | 0 | 1 | 1 | 0 | 1 | 3 | 0.5 | 2.666666667 | 29 | 0.838888889 | 75_90 |
| 493 | HACIENDA DR | 1 | 0 | 1 | 0 | 1 | 3 | 0.5 | 2.666666667 | 30 | 0.833333333 | 75_90 |
| 522 | DUBLIN BL | 0 | 0 | 2 | 1 | 1 | 4 | 0.5 | 2.666666667 | 31 | 0.827777778 | 75_90 |
| 537 | DUBLIN BL | 0 | 0 | 2 | 1 | 1 | 4 | 0.5 | 2.666666667 | 32 | 0.822222222 | 75_90 |
| 586 | DUBLIN BL | 0 | 1 | 1 | 0 | 1 | 3 | 0.5 | 2.666666667 | 33 | 0.816666667 | 75_90 |
| 594 | HACIENDA DR | 1 | 0 | 1 | 0 | 1 | 3 | 0.5 | 2.666666667 | 34 | 0.811111111 | 75_90 |
| 631 | DUBLIN BL | 0 | 1 | 1 | 0 | 1 | 3 | 0.5 | 2.666666667 | 35 | 0.805555556 | 75_90 |
| 683 | DUBLIN BL | 0 | 1 | 1 | 0 | 1 | 3 | 0.5 | 2.666666667 | 36 | 0.8 | 75_90 |
| 1485 | VILLAGE PW | 0 | 0 | 1 | 2 | 1 | 4 | 0.5 | 2.666666667 | 37 | 0.794444444 | 75_90 |
| 97 | BENT TREE DR | 0 | 1 | 1 | 0 | 0 | 2 | 0.3832796 | 2.5 | 38 | 0.788888889 | 75_90 |
| 126 | BURTON ST | 0 | 0 | 1 | 2 | 0 | 3 | 0.0990718 | 2.5 | 39 | 0.783333333 | 75_90 |
| 740 | DUBLIN BL | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 2.5 | 40 | 0.777777778 | 75_90 |
| 750 | DUBLIN BL | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 2.5 | 41 | 0.772222222 | 75_90 |
| 1033 | TWIN EAGLES LN | 0 | 1 | 1 | 0 | 0 | 2 | 0.12372 | 2.5 | 42 | 0.766666667 | 75_90 |
| 1095 | TAMARACK DR | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 2.5 | 43 | 0.761111111 | 75_90 |
| 1232 | TAMARACK DR | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 2.5 | 44 | 0.755555556 | 75_90 |
| 1364 | VILLAGE PW | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 2.5 | 45 | 0.75 | 75_90 |
| 1386 | VILLAGE PW | 0 | 0 | 3 | 0 | 0 | 3 | 0.5 | 2.5 | 46 | 0.744444444 | 75_90 |
| 1393 | VILLAGE PW | 0 | 0 | 1 | 2 | 0 | 3 | 0.5 | 2.5 | 47 | 0.738888889 | 75_90 |
| 1398 | VILLAGE PW | 0 | 0 | 1 | 2 | 0 | 3 | 0.5 | 2.5 | 48 | 0.733333333 | 75_90 |
| 1407 | VILLAGE PW | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 2.5 | 49 | 0.727777778 | 75_90 |
| 133 | AMADOR PLAZA RD | 0 | 1 | 0 | 0 | 1 | 2 | 0.5 | 1.833333333 | 50 | 0.722222222 | 50_75 |
| 680 | GLYNNIS ROSE DR | 0 | 0 | 2 | 0 | 1 | 3 | 0.3829053 | 1.833333333 | 51 | 0.716666667 | 50_75 |
| 74 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 1.833333333 | 52 | 0.711111111 | 50_75 |
| 158 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 1.833333333 | 53 | 0.705555556 | 50_75 |
| 227 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 1.833333333 | 54 | 0.7 | 50_75 |
| 275 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 1.833333333 | 55 | 0.694444444 | 50_75 |
| 324 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 1.833333333 | 56 | 0.688888889 | 50_75 |
| 333 | DUBLIN BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 1.833333333 | 57 | 0.683333333 | 50_75 |
| 365 | DUBLIN BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 1.833333333 | 58 | 0.677777778 | 50_75 |
| 649 | DUBLIN BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 1.833333333 | 59 | 0.672222222 | 50_75 |
| 972 | KEEGAN ST | 0 | 0 | 1 | 1 | 1 | 3 | 0.2691345 | 1.833333333 | 60 | 0.666666667 | 50_75 |
| 53 | CENTRAL PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 61 | 0.661111111 | 50_75 |
| 79 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 62 | 0.655555556 | 50_75 |
| 86 | CENTRAL PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 63 | 0.65 | 50_75 |
| 110 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 64 | 0.644444444 | 50_75 |
| 129 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 65 | 0.638888889 | 50_75 |
| 166 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 66 | 0.633333333 | 50_75 |
| 174 | AMADOR PLAZA RD | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 | 1.666666667 | 67 | 0.627777778 | 50_75 |
| 193 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 68 | 0.622222222 | 50_75 |
| 204 | CENTRAL PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 69 | 0.616666667 | 50_75 |
| 241 | ASPEN ST | 0 | 0 | 1 | 1 | 0 | 2 | 0.3253174 | 1.666666667 | 70 | 0.611111111 | 50_75 |
| 278 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 71 | 0.605555556 | 50_75 |
| 284 | CENTRAL PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 72 | 0.6 | 50_75 |
| 330 | CENTRAL PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 73 | 0.594444444 | 50_75 |
| 413 | DUBLIN BL | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 1.666666667 | 74 | 0.588888889 | 50_75 |
| 433 | CLARK AV | 0 | 0 | 1 | 1 | 0 | 2 | 0.2139419 | 1.666666667 | 75 | 0.583333333 | 50_75 |
| 818 | LOCUST PL N | 0 | 1 | 0 | 0 | 0 | 1 | 0.1212688 | 1.666666667 | 76 | 0.577777778 | 50_75 |
| 907 | HILLBROOK PL | 1 | 0 | 0 | 0 | 0 | 1 | 0.2892606 | 1.666666667 | 77 | 0.572222222 | 50_75 |
| 1029 | SAN RAMON RD | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 | 1.666666667 | 78 | 0.566666667 | 50_75 |
| 1072 | ROLLING HILLS DR | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 | 1.666666667 | 79 | 0.561111111 | 50_75 |
| 1081 | SAN RAMON RD | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 | 1.666666667 | 80 | 0.555555556 | 50_75 |

| FID | Street | Fatal Crashes | Severe Injury Crashes | Moderate Injury Crashes | Minor Injury Crashes | PDO Crashes | Total Crashes | Segment Length | Annualized EqPDO Score | Rank | Percentile | Percentile Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1167 | TYNE CT | 0 | 1 | 0 | 0 | 0 | 1 | 0.03766 | 1.666666667 | 81 | 0.55 | 50_75 |
| 1186 | SAN RAMON RD | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 | 1.666666667 | 82 | 0.544444444 | 50_75 |
| 1266 | ROLLING HILLS DR | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 | 1.666666667 | 83 | 0.538888889 | 50_75 |
| 1300 | TAMARACK DR | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 1.666666667 | 84 | 0.533333333 | 50_75 |
| 1312 | PENN DR | 0 | 1 | 0 | 0 | 0 | 1 | 0.3329521 | 1.666666667 | 85 | 0.527777778 | 50_75 |
| 1320 | SAN RAMON RD | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 | 1.666666667 | 86 | 0.522222222 | 50_75 |
| 1344 | SIERRA CT | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 1.666666667 | 87 | 0.516666667 | 50_75 |
| 1355 | SAN RAMON RD | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 | 1.666666667 | 88 | 0.511111111 | 50_75 |
| 1363 | VOMAC RD | 0 | 1 | 0 | 0 | 0 | 1 | 0.4393404 | 1.666666667 | 89 | 0.505555556 | 50_75 |
| 1426 | W VOMAC RD | 0 | 1 | 0 | 0 | 0 | 1 | 0.456675 | 1.666666667 | 90 | 0.5 | 50_75 |
| 1465 | VILLAGE PW | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 1.666666667 | 91 | 0.494444444 | 50_75 |
| 1467 | WINDING TRAIL LN | 0 | 1 | 0 | 0 | 0 | 1 | 0.027529 | 1.666666667 | 92 | 0.488888889 | 50_75 |
| 1471 | VILLAGE PW | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 1.666666667 | 93 | 0.483333333 | 50_75 |
| 1479 | VILLAGE PW | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 1.666666667 | 94 | 0.477777778 | 50_75 |
| 1493 | VILLAGE PW | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 1.666666667 | 95 | 0.472222222 | 50_75 |
| 52 | BRIGHTON DR | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 96 | 0.466666667 | 0_50 |
| 58 | CENTRAL PW | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 97 | 0.461111111 | 0_50 |
| 105 | ANTONE WY | 0 | 0 | 0 | 1 | 1 | 2 | 0.3626265 | 1 | 98 | 0.455555556 | 0_50 |
| 124 | CENTRAL PW | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 99 | 0.45 | 0_50 |
| 128 | CENTRAL PW | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 100 | 0.444444444 | 0_50 |
| 186 | BRIGHTON DR | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 101 | 0.438888889 | 0_50 |
| 192 | CENTRAL PW | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 102 | 0.433333333 | 0_50 |
| 251 | BRIGHTON DR | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 103 | 0.427777778 | 0_50 |
| 317 | BRIGHTON DR | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 104 | 0.422222222 | 0_50 |
| 323 | CENTRAL PW | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 105 | 0.416666667 | 0_50 |
| 401 | HACIENDA DR | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 106 | 0.411111111 | 0_50 |
| 428 | GRAFTON ST | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 1 | 107 | 0.405555556 | 0_50 |
| 429 | DUBLIN BL | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 1 | 108 | 0.4 | 0_50 |
| 538 | DUBLIN BL | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 1 | 109 | 0.394444444 | 0_50 |
| 892 | MYRTLE DR | 0 | 0 | 0 | 1 | 1 | 2 | 0.1348713 | 1 | 110 | 0.388888889 | 0_50 |
| 986 | LEE THOMPSON ST | 0 | 0 | 1 | 0 | 1 | 2 | 0.2958484 | 1 | 111 | 0.383333333 | 0_50 |
| 1024 | SAINT PATRICK WY | 0 | 0 | 1 | 0 | 1 | 2 | 0.3965917 | 1 | 112 | 0.377777778 | 0_50 |
| 1156 | TOYOTA DR | 0 | 0 | 0 | 1 | 1 | 2 | 0.1965035 | 1 | 113 | 0.372222222 | 0_50 |
| 1451 | VILLAGE PW | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 1 | 114 | 0.366666667 | 0_50 |
| 68 | AMANDA ST | 0 | 0 | 1 | 0 | 0 | 1 | 0.1037903 | 0.833333333 | 115 | 0.361111111 | 0_50 |
| 80 | CANTERBURY LN | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 116 | 0.355555556 | 0_50 |
| 98 | CAMPBELL GREEN | 0 | 0 | 0 | 1 | 0 | 1 | 0.0255053 | 0.833333333 | 117 | 0.35 | 0_50 |
| 167 | CHARLTON CT | 0 | 0 | 1 | 0 | 0 | 1 | 0.0127258 | 0.833333333 | 118 | 0.344444444 | 0_50 |
| 194 | CAMPBELL LN | 0 | 0 | 1 | 0 | 0 | 1 | 0.1909359 | 0.833333333 | 119 | 0.338888889 | 0_50 |
| 249 | BRIGHTON DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 120 | 0.333333333 | 0_50 |
| 257 | BRIGHTON DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 121 | 0.327777778 | 0_50 |
| 306 | CANTERBURY LN | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 122 | 0.322222222 | 0_50 |
| 341 | DUBLIN BL | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 123 | 0.316666667 | 0_50 |
| 346 | HARTLAND LN | 0 | 0 | 0 | 1 | 0 | 1 | 0.0431559 | 0.833333333 | 124 | 0.311111111 | 0_50 |
| 357 | DAVONA DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 125 | 0.305555556 | 0_50 |
| 376 | E CANTARA DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.1453459 | 0.833333333 | 126 | 0.3 | 0_50 |
| 380 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 127 | 0.294444444 | 0_50 |
| 421 | DUBLIN BL | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 128 | 0.288888889 | 0_50 |
| 426 | CIVIC PZ | 0 | 0 | 1 | 0 | 0 | 1 | 0.2322135 | 0.833333333 | 129 | 0.283333333 | 0_50 |
| 435 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 130 | 0.277777778 | 0_50 |
| 447 | DAVONA DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 131 | 0.272222222 | 0_50 |
| 474 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 132 | 0.266666667 | 0_50 |
| 514 | DUBLIN BL | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 133 | 0.261111111 | 0_50 |
| 547 | HARTLAND CT | 0 | 0 | 0 | 1 | 0 | 1 | 0.0415387 | 0.833333333 | 134 | 0.255555556 | 0_50 |
| 568 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 135 | 0.25 | 0_50 |
| 588 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 136 | 0.244444444 | 0_50 |
| 603 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 137 | 0.238888889 | 0_50 |
| 614 | HACIENDA DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 138 | 0.233333333 | 0_50 |
| 616 | DUBLIN BL | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 139 | 0.227777778 | 0_50 |
| 617 | FOXCROFT WY | 0 | 0 | 1 | 0 | 0 | 1 | 0.061691 | 0.833333333 | 140 | 0.222222222 | 0_50 |
| 657 | DUBLIN BL | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 141 | 0.216666667 | 0_50 |
| 705 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 142 | 0.211111111 | 0_50 |
| 734 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 143 | 0.205555556 | 0_50 |
| 737 | GOLDEN GATE DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.2084345 | 0.833333333 | 144 | 0.2 | 0_50 |
| 738 | GROVELAND LN | 0 | 0 | 1 | 0 | 0 | 1 | 0.0417226 | 0.833333333 | 145 | 0.194444444 | 0_50 |
| 779 | LOCKHART ST | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 146 | 0.188888889 | 0_50 |
| 792 | OAK BLUFF LN | 0 | 0 | 1 | 0 | 0 | 1 | 0.2777243 | 0.833333333 | 147 | 0.183333333 | 0_50 |
| 805 | N SPAGO DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.1618169 | 0.833333333 | 148 | 0.177777778 | 0_50 |
| 820 | N DUBLIN RANCH DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 149 | 0.172222222 | 0_50 |
| 845 | HIBERNIA DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.3222054 | 0.833333333 | 150 | 0.166666667 | 0_50 |
| 853 | LEWIS AV | 0 | 0 | 0 | 1 | 0 | 1 | 0.0782577 | 0.833333333 | 151 | 0.161111111 | 0_50 |
| 887 | LOCKHART ST | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 152 | 0.155555556 | 0_50 |
| 913 | N DUBLIN RANCH DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 153 | 0.15 | 0_50 |
| 925 | LOCKHART ST | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 154 | 0.144444444 | 0_50 |
| 957 | IRONHORSE PW | 0 | 0 | 0 | 1 | 0 | 1 | 0.3890455 | 0.833333333 | 155 | 0.138888889 | 0_50 |
| 1001 | MARTINELLI WY | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 156 | 0.133333333 | 0_50 |
| 1094 | SIERRA CT | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 157 | 0.127777778 | 0_50 |
| 1099 | PALERMO WY | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 158 | 0.122222222 | 0_50 |
| 1117 | S BRIDGEPOINTE LN | 0 | 0 | 0 | 1 | 0 | 1 | 0.2159105 | 0.833333333 | 159 | 0.116666667 | 0_50 |
| 1135 | TAMARACK DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 160 | 0.111111111 | 0_50 |

| FID | Street | Fatal Crashes | Severe Injury Crashes | Moderate Injury Crashes | Minor Injury Crashes | PDO Crashes | Total Crashes | Segment Length | Annualized EqPDO Score | Rank | Percentile | Percentile Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1136 | TASSAJARA RD | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 161 | 0.105555556 | 0_50 |
| 1155 | SAN RAMON RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 162 | 0.1 | 0_50 |
| 1192 | SIERRA CT | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 163 | 0.094444444 | 0_50 |
| 1197 | SAN RAMON RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 164 | 0.088888889 | 0_50 |
| 1218 | TAMARACK DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 165 | 0.083333333 | 0_50 |
| 1260 | TASSAJARA RD | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.833333333 | 166 | 0.077777778 | 0_50 |
| 1324 | SUTTON LN | 0 | 0 | 0 | 1 | 0 | 1 | 0.1856974 | 0.833333333 | 167 | 0.072222222 | 0_50 |
| 1422 | VILLAGE PW | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 168 | 0.066666667 | 0_50 |
| 1446 | VILLAGE PW | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.833333333 | 169 | 0.061111111 | 0_50 |
| 1457 | UNNAMED | 0 | 0 | 1 | 0 | 0 | 1 | 0.0515973 | 0.833333333 | 170 | 0.055555556 | 0_50 |
| 1484 | WICKLOW LN | 0 | 0 | 0 | 1 | 0 | 1 | 0.4141705 | 0.833333333 | 171 | 0.05 | 0_50 |
| 203 | BRIGHTON DR | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 172 | 0.044444444 | 0_50 |
| 268 | BROOKDALE CT | 0 | 0 | 0 | 0 | 1 | 1 | 0.0938058 | 0.166666667 | 173 | 0.038888889 | 0_50 |
| 361 | DUBLIN BL | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 174 | 0.033333333 | 0_50 |
| 572 | HACIENDA CROSSING | 0 | 0 | 0 | 0 | 1 | 1 | 0.3605973 | 0.166666667 | 175 | 0.027777778 | 0_50 |
| 888 | MANSFIELD AV | 0 | 0 | 0 | 0 | 1 | 1 | 0.2744785 | 0.166666667 | 176 | 0.022222222 | 0_50 |
| 1013 | MARTINELLI WY | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 177 | 0.016666667 | 0_50 |
| 1205 | SHADOW PL | 0 | 0 | 0 | 0 | 1 | 1 | 0.0251716 | 0.166666667 | 178 | 0.011111111 | 0_50 |
| 1325 | SHADOW DR | 0 | 0 | 0 | 0 | 1 | 1 | 0.1588817 | 0.166666667 | 179 | 0.005555556 | 0_50 |
| 1487 | UNNAMED | 0 | 0 | 0 | 0 | 1 | 1 | 0.0811947 | 0.166666667 | 180 | 0 | 0_50 |

| FID | Street | Fatal Crashes | Severe Injury Crashes | Moderate Injury Crashes | Minor Injury Crashes | PDO Crashes | Total Crashes | Segment Length | Crash Frequency (annual) | Annualized EqPDO Score | Rank | Percentile | Percentile Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 624 | DUBLIN BL | 1 | 1 | 2 | 2 | 0 | 6 | 0.5 | 1 | 6.666666667 | 1 | 0.994252874 | 90_100 |
| 1439 | VILLAGE PW | 0 | 1 | 4 | 1 | 1 | 7 | 0.5 | 1.166666667 | 6 | 2 | 0.988505747 | 90_100 |
| 454 | DUBLIN BL | 0 | 0 | 3 | 3 | 4 | 10 | 0.5 | 1.666666667 | 5.666666667 | 3 | 0.982758621 | 90_100 |
| 674 | DUBLIN BL | 0 | 0 | 3 | 3 | 3 | 9 | 0.5 | 1.5 | 5.5 | 4 | 0.977011494 | 90_100 |
| 461 | DUBLIN BL | 1 | 1 | 0 | 2 | 0 | 4 | 0.5 | 0.666666667 | 5 | 5 | 0.971264368 | 90_100 |
| 572 | DUBLIN BL | 1 | 1 | 0 | 2 | 0 | 4 | 0.5 | 0.666666667 | 5 | 6 | 0.965517241 | 90_100 |
| 1422 | VILLAGE PW | 0 | 1 | 4 | 0 | 0 | 5 | 0.5 | 0.833333333 | 5 | 7 | 0.959770115 | 90_100 |
| 1451 | VILLAGE PW | 0 | 1 | 4 | 0 | 0 | 5 | 0.5 | 0.833333333 | 5 | 8 | 0.954022989 | 90_100 |
| 1478 | VILLAGE PW | 0 | 1 | 4 | 0 | 0 | 5 | 0.5 | 0.833333333 | 5 | 9 | 0.948275862 | 90_100 |
| 355 | DUBLIN BL | 0 | 0 | 2 | 3 | 2 | 7 | 0.5 | 1.166666667 | 4.5 | 10 | 0.942528736 | 90_100 |
| 1360 | VILLAGE PW | 0 | 0 | 2 | 3 | 1 | 6 | 0.5 | 1 | 4.333333333 | 11 | 0.936781609 | 90_100 |
| 1455 | VILLAGE PW | 0 | 0 | 2 | 3 | 1 | 6 | 0.5 | 1 | 4.333333333 | 12 | 0.931034483 | 90_100 |
| 1463 | VILLAGE PW | 0 | 0 | 3 | 2 | 1 | 6 | 0.5 | 1 | 4.333333333 | 13 | 0.925287356 | 90_100 |
| 19 | ARNOLD RD | 1 | 1 | 0 | 1 | 0 | 3 | 0.5 | 0.5 | 4.166666667 | 14 | 0.91954023 | 90_100 |
| 40 | ARNOLD RD | 1 | 1 | 0 | 1 | 0 | 3 | 0.5 | 0.5 | 4.166666667 | 15 | 0.913793103 | 90_100 |
| 215 | ARNOLD RD | 1 | 1 | 0 | 1 | 0 | 3 | 0.5 | 0.5 | 4.166666667 | 16 | 0.908045977 | 90_100 |
| 543 | DUBLIN BL | 1 | 1 | 0 | 1 | 0 | 3 | 0.5 | 0.5 | 4.166666667 | 17 | 0.902298851 | 90_100 |
| 644 | DUBLIN BL | 1 | 1 | 0 | 1 | 0 | 3 | 0.5 | 0.5 | 4.166666667 | 18 | 0.896551724 | 90_100 |
| 559 | DUBLIN BL | 0 | 0 | 2 | 2 | 3 | 7 | 0.5 | 1.166666667 | 3.833333333 | 19 | 0.890804598 | 75_90 |
| 745 | DUBLIN BL | 0 | 0 | 2 | 2 | 3 | 7 | 0.5 | 1.166666667 | 3.833333333 | 20 | 0.885057471 | 75_90 |
| 1470 | VILLAGE PW | 0 | 0 | 2 | 2 | 2 | 6 | 0.5 | 1 | 3.666666667 | 21 | 0.879310345 | 75_90 |
| 1380 | VILLAGE PW | 0 | 1 | 2 | 0 | 0 | 3 | 0.5 | 0.5 | 3.333333333 | 22 | 0.873563218 | 75_90 |
| 89 | AMADOR VALLEY BL | 0 | 0 | 2 | 1 | 1 | 4 | 0.5 | 0.666666667 | 2.666666667 | 23 | 0.867816092 | 75_90 |
| 182 | AMADOR VALLEY BL | 0 | 0 | 2 | 1 | 1 | 4 | 0.5 | 0.666666667 | 2.666666667 | 24 | 0.862068966 | 75_90 |
| 1366 | VILLAGE PW | 0 | 0 | 1 | 2 | 1 | 4 | 0.5 | 0.666666667 | 2.666666667 | 25 | 0.856321839 | 75_90 |
| 54 | AMADOR VALLEY BL | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 0.5 | 2.5 | 26 | 0.850574713 | 75_90 |
| 251 | AMADOR VALLEY BL | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 0.5 | 2.5 | 27 | 0.844827586 | 75_90 |
| 363 | DUBLIN BL | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 0.5 | 2.5 | 28 | 0.83908046 | 75_90 |
| 533 | DUBLIN BL | 0 | 0 | 2 | 1 | 0 | 3 | 0.5 | 0.5 | 2.5 | 29 | 0.833333333 | 75_90 |
| 1387 | VILLAGE PW | 0 | 0 | 1 | 2 | 0 | 3 | 0.5 | 0.5 | 2.5 | 30 | 0.827586207 | 75_90 |
| 507 | DUBLIN BL | 0 | 0 | 1 | 1 | 4 | 6 | 0.5 | 1 | 2.333333333 | 31 | 0.82183908 | 75_90 |
| 723 | DUBLIN BL | 0 | 0 | 1 | 1 | 4 | 6 | 0.5 | 1 | 2.333333333 | 32 | 0.816091954 | 75_90 |
| 1412 | VILLAGE PW | 0 | 0 | 1 | 1 | 2 | 4 | 0.5 | 0.666666667 | 2 | 33 | 0.810344828 | 75_90 |
| 440 | HACIENDA DR | 0 | 0 | 2 | 0 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 34 | 0.804597701 | 75_90 |
| 524 | DUBLIN BL | 0 | 0 | 0 | 2 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 35 | 0.798850575 | 75_90 |
| 550 | HACIENDA DR | 0 | 0 | 2 | 0 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 36 | 0.793103448 | 75_90 |
| 555 | DUBLIN BL | 0 | 0 | 0 | 2 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 37 | 0.787356322 | 75_90 |
| 592 | DUBLIN BL | 0 | 0 | 0 | 2 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 38 | 0.781609195 | 75_90 |
| 602 | HACIENDA DR | 0 | 0 | 2 | 0 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 39 | 0.775862069 | 75_90 |
| 610 | DUBLIN BL | 0 | 0 | 0 | 2 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 40 | 0.770114943 | 75_90 |
| 639 | HACIENDA DR | 0 | 0 | 2 | 0 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 41 | 0.764367816 | 75_90 |
| 683 | DUBLIN BL | 0 | 0 | 0 | 2 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 42 | 0.75862069 | 75_90 |
| 136 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 43 | 0.752873563 | 75_90 |
| 224 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 44 | 0.747126437 | 75_90 |
| 331 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 45 | 0.74137931 | 75_90 |
| 1075 | TAMARACK DR | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 46 | 0.735632184 | 75_90 |
| 1090 | TAMARACK DR | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 47 | 0.729885057 | 75_90 |
| 1097 | TAMARACK DR | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 48 | 0.724137931 | 75_90 |
| 1113 | TAMARACK DR | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 49 | 0.718390805 | 75_90 |
| 1235 | TAMARACK DR | 0 | 0 | 1 | 1 | 1 | 3 | 0.5 | 0.5 | 1.833333333 | 50 | 0.712643678 | 75_90 |
| 2 | BRIGHTON DR | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 51 | 0.706896552 | 50_75 |
| 41 | AMADOR VALLEY BL | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 52 | 0.701149425 | 50_75 |
| 44 | BRIGHTON DR | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 53 | 0.695402299 | 50_75 |
| 58 | BRIGHTON DR | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 54 | 0.689655172 | 50_75 |
| 72 | BRIGHTON DR | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 55 | 0.683908046 | 50_75 |
| 97 | CENTRAL PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 56 | 0.67816092 | 50_75 |
| 189 | CENTRAL PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 57 | 0.672413793 | 50_75 |
| 217 | BRIGHTON DR | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 58 | 0.666666667 | 50_75 |
| 292 | BRIGHTON DR | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 59 | 0.66091954 | 50_75 |
| 329 | CENTRAL PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 60 | 0.655172414 | 50_75 |
| 346 | FALLON RD | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 61 | 0.649425287 | 50_75 |
| 424 | DUBLIN BL | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 62 | 0.643678161 | 50_75 |
| 464 | DUBLIN BL | 0 | 0 | 2 | 0 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 63 | 0.637931034 | 50_75 |
| 598 | FALLON RD | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 64 | 0.632183908 | 50_75 |
| 754 | FALLON RD | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 65 | 0.626436782 | 50_75 |
| 782 | HIBERNIA DR | 0 | 0 | 2 | 0 | 0 | 2 | 0.3222054 | 0.333333333 | 1.666666667 | 66 | 0.620689655 | 50_75 |
| 1287 | REGIONAL ST | 0 | 0 | 1 | 1 | 0 | 2 | 0.402237 | 0.333333333 | 1.666666667 | 67 | 0.614942529 | 50_75 |
| 1445 | VILLAGE PW | 0 | 0 | 1 | 1 | 0 | 2 | 0.5 | 0.333333333 | 1.666666667 | 68 | 0.609195402 | 50_75 |
| 731 | DUBLIN BL | 0 | 0 | 1 | 0 | 3 | 4 | 0.5 | 0.666666667 | 1.333333333 | 69 | 0.603448276 | 50_75 |
| 133 | AMADOR VALLEY BL | 0 | 0 | 1 | 0 | 2 | 3 | 0.5 | 0.5 | 1.166666667 | 70 | 0.597701149 | 50_75 |
| 194 | AMADOR VALLEY BL | 0 | 0 | 1 | 0 | 2 | 3 | 0.5 | 0.5 | 1.166666667 | 71 | 0.591954023 | 50_75 |
| 235 | AMADOR VALLEY BL | 0 | 0 | 1 | 0 | 2 | 3 | 0.5 | 0.5 | 1.166666667 | 72 | 0.586206897 | 50_75 |
| 334 | GRAFTON ST | 0 | 0 | 0 | 1 | 2 | 3 | 0.5 | 0.5 | 1.166666667 | 73 | 0.58045977 | 50_75 |
| 446 | DUBLIN BL | 0 | 0 | 0 | 1 | 2 | 3 | 0.5 | 0.5 | 1.166666667 | 74 | 0.574712644 | 50_75 |
| 613 | DUBLIN BL | 0 | 0 | 0 | 1 | 2 | 3 | 0.5 | 0.5 | 1.166666667 | 75 | 0.568965517 | 50_75 |
| 43 | BRANNIGAN ST | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 76 | 0.563218391 | 50_75 |
| 80 | CENTRAL PW | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 0.333333333 | 1 | 77 | 0.557471264 | 50_75 |
| 111 | CENTRAL PW | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 0.333333333 | 1 | 78 | 0.551724138 | 50_75 |
| 156 | BRANNIGAN ST | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 79 | 0.545977011 | 50_75 |
| 237 | BRANNIGAN ST | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 80 | 0.540229885 | 50_75 |

| FID | Street | Fatal Crashes | Severe Injury Crashes | Moderate Injury Crashes | Minor Injury Crashes | PDO Crashes | Total Crashes | Segment Length | Crash Frequency (annual) | Annualized EqPDO Score | Rank | Percentile | Percentile Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 264 | CENTRAL PW | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 0.333333333 | 1 | 81 | 0.534482759 | 50_75 |
| 311 | AMADOR VALLEY BL | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 0.333333333 | 1 | 82 | 0.528735632 | 50_75 |
| 328 | AMADOR VALLEY BL | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 0.333333333 | 1 | 83 | 0.522988506 | 50_75 |
| 337 | GLEASON DR | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 84 | 0.517241379 | 50_75 |
| 383 | GLEASON DR | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 85 | 0.511494253 | 50_75 |
| 410 | DUBLIN BL | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 86 | 0.505747126 | 50_75 |
| 416 | HACIENDA DR | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 | 0.333333333 | 1 | 87 | 0.5 | 50_75 |
| 451 | GLEASON DR | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 88 | 0.494252874 | 50_75 |
| 480 | DUBLIN BL | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 89 | 0.488505747 | 50_75 |
| 482 | GRAFTON ST | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 90 | 0.482758621 | 50_75 |
| 509 | GLEASON DR | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 91 | 0.477011494 | 50_75 |
| 513 | DUBLIN BL | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 92 | 0.471264368 | 50_75 |
| 539 | GRAFTON ST | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 93 | 0.465517241 | 50_75 |
| 553 | GLEASON DR | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 94 | 0.459770115 | 50_75 |
| 585 | DUBLIN BL | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 95 | 0.454022989 | 50_75 |
| 650 | DUBLIN BL | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 96 | 0.448275862 | 50_75 |
| 1039 | SAN RAMON RD | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 97 | 0.442528736 | 50_75 |
| 1189 | SAN RAMON RD | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 | 0.333333333 | 1 | 98 | 0.436781609 | 50_75 |
| 49 | CENTRAL PW | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 99 | 0.431034483 | 0_50 |
| 50 | ASPEN ST | 0 | 0 | 1 | 0 | 0 | 1 | 0.3253174 | 0.166666667 | 0.833333333 | 100 | 0.425287356 | 0_50 |
| 105 | ASTERWOOD DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.2313162 | 0.166666667 | 0.833333333 | 101 | 0.41954023 | 0_50 |
| 117 | AMADOR VALLEY BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 102 | 0.413793103 | 0_50 |
| 225 | CENTRAL PW | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 103 | 0.408045977 | 0_50 |
| 267 | BENT TREE DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.3832796 | 0.166666667 | 0.833333333 | 104 | 0.402298851 | 0_50 |
| 291 | CENTRAL PW | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 105 | 0.396551724 | 0_50 |
| 304 | CENTRAL PW | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 106 | 0.390804598 | 0_50 |
| 336 | HASTINGS WY | 0 | 0 | 0 | 1 | 0 | 1 | 0.0315332 | 0.166666667 | 0.833333333 | 107 | 0.385057471 | 0_50 |
| 360 | DUBLIN BL | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 108 | 0.379310345 | 0_50 |
| 397 | FALLON RD | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 109 | 0.373563218 | 0_50 |
| 435 | FALLON RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 110 | 0.367816092 | 0_50 |
| 436 | FORINO DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 111 | 0.362068966 | 0_50 |
| 473 | DUBLIN BL | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 112 | 0.356321839 | 0_50 |
| 519 | FALLON RD | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 113 | 0.350574713 | 0_50 |
| 536 | FORINO DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 114 | 0.344827586 | 0_50 |
| 563 | FALLON RD | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 115 | 0.33908046 | 0_50 |
| 618 | CROAK RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.330384 | 0.166666667 | 0.833333333 | 116 | 0.333333333 | 0_50 |
| 627 | FALLON RD | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 117 | 0.327586207 | 0_50 |
| 649 | FALLON RD | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 118 | 0.32183908 | 0_50 |
| 682 | CLARK AV | 0 | 0 | 0 | 1 | 0 | 1 | 0.2139419 | 0.166666667 | 0.833333333 | 119 | 0.316091954 | 0_50 |
| 710 | DUBLIN BL | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 120 | 0.310344828 | 0_50 |
| 730 | DUBLIN BL | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 121 | 0.304597701 | 0_50 |
| 740 | DAVONA DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 122 | 0.298850575 | 0_50 |
| 879 | IRONHORSE PW | 0 | 0 | 1 | 0 | 0 | 1 | 0.3890455 | 0.166666667 | 0.833333333 | 123 | 0.293103448 | 0_50 |
| 1047 | TASSAJARA RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 124 | 0.287356322 | 0_50 |
| 1053 | SAN RAMON RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 125 | 0.281609195 | 0_50 |
| 1086 | TASSAJARA RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 126 | 0.275862069 | 0_50 |
| 1103 | TASSAJARA RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 127 | 0.270114943 | 0_50 |
| 1122 | POSITANO PW | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 128 | 0.264367816 | 0_50 |
| 1125 | SAN RAMON RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 129 | 0.25862069 | 0_50 |
| 1152 | SUMMER GLEN DR | 0 | 0 | 1 | 0 | 0 | 1 | 0.4586498 | 0.166666667 | 0.833333333 | 130 | 0.252873563 | 0_50 |
| 1219 | REDWOOD AV | 0 | 0 | 1 | 0 | 0 | 1 | 0.1709642 | 0.166666667 | 0.833333333 | 131 | 0.247126437 | 0_50 |
| 1253 | SAN RAMON RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 132 | 0.24137931 | 0_50 |
| 1254 | TASSAJARA RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 133 | 0.235632184 | 0_50 |
| 1276 | TWIN EAGLES LN | 0 | 0 | 1 | 0 | 0 | 1 | 0.12372 | 0.166666667 | 0.833333333 | 134 | 0.229885057 | 0_50 |
| 1296 | SAN RAMON RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 135 | 0.224137931 | 0_50 |
| 1307 | SCARLETT DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.2489757 | 0.166666667 | 0.833333333 | 136 | 0.218390805 | 0_50 |
| 1323 | SAN RAMON RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 137 | 0.212643678 | 0_50 |
| 1354 | TASSAJARA RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 138 | 0.206896552 | 0_50 |
| 1372 | VOMAC RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.4393404 | 0.166666667 | 0.833333333 | 139 | 0.201149425 | 0_50 |
| 1397 | VALENTANO DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 140 | 0.195402299 | 0_50 |
| 1497 | W VOMAC RD | 0 | 0 | 1 | 0 | 0 | 1 | 0.456675 | 0.166666667 | 0.833333333 | 141 | 0.189655172 | 0_50 |
| 1498 | VALENTANO DR | 0 | 0 | 0 | 1 | 0 | 1 | 0.5 | 0.166666667 | 0.833333333 | 142 | 0.183908046 | 0_50 |
| 231 | AMADOR PLAZA RD | 0 | 0 | 0 | 0 | 3 | 3 | 0.5 | 0.5 | 0.5 | 143 | 0.17816092 | 0_50 |
| 606 | DUBLIN BL | 0 | 0 | 0 | 0 | 3 | 3 | 0.5 | 0.5 | 0.5 | 144 | 0.172413793 | 0_50 |
| 101 | AMADOR PLAZA RD | 0 | 0 | 0 | 0 | 2 | 2 | 0.5 | 0.333333333 | 0.333333333 | 145 | 0.166666667 | 0_50 |
| 341 | DUBLIN BL | 0 | 0 | 0 | 0 | 2 | 2 | 0.5 | 0.333333333 | 0.333333333 | 146 | 0.16091954 | 0_50 |
| 396 | DOUGHERTY RD | 0 | 0 | 0 | 0 | 2 | 2 | 0.5 | 0.333333333 | 0.333333333 | 147 | 0.155172414 | 0_50 |
| 406 | DUBLIN BL | 0 | 0 | 0 | 0 | 2 | 2 | 0.5 | 0.333333333 | 0.333333333 | 148 | 0.149425287 | 0_50 |
| 411 | DOUGHERTY RD | 0 | 0 | 0 | 0 | 2 | 2 | 0.5 | 0.333333333 | 0.333333333 | 149 | 0.143678161 | 0_50 |
| 444 | DUBLIN BL | 0 | 0 | 0 | 0 | 2 | 2 | 0.5 | 0.333333333 | 0.333333333 | 150 | 0.137931034 | 0_50 |
| 694 | DUBLIN BL | 0 | 0 | 0 | 0 | 2 | 2 | 0.5 | 0.333333333 | 0.333333333 | 151 | 0.132183908 | 0_50 |
| 750 | DOUGHERTY RD | 0 | 0 | 0 | 0 | 2 | 2 | 0.5 | 0.333333333 | 0.333333333 | 152 | 0.126436782 | 0_50 |
| 1012 | LANCASTER RD | 0 | 0 | 0 | 0 | 2 | 2 | 0.2953148 | 0.333333333 | 0.333333333 | 153 | 0.120689655 | 0_50 |
| 257 | BRIGHTON DR | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 154 | 0.114942529 | 0_50 |
| 283 | AMADOR VALLEY BL | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 155 | 0.109195402 | 0_50 |
| 295 | CAPOTERRA WY | 0 | 0 | 0 | 0 | 1 | 1 | 0.3317445 | 0.166666667 | 0.166666667 | 156 | 0.103448276 | 0_50 |
| 393 | DUBLIN BL | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 157 | 0.097701149 | 0_50 |
| 455 | DOUGHERTY RD | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 158 | 0.091954023 | 0_50 |
| 462 | CLARINBRIDGE CI | 0 | 0 | 0 | 0 | 1 | 1 | 0.0359862 | 0.166666667 | 0.166666667 | 159 | 0.086206897 | 0_50 |
| 548 | DUBLIN BL | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 160 | 0.08045977 | 0_50 |

| FID | Street | Fatal Crashes | Severe Injury Crashes | Moderate Injury Crashes | Minor Injury Crashes | PDO Crashes | Total Crashes | Segment Length | Crash Frequency (annual) | Annualized EqPDO Score | Rank | Percentile | Percentile Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 637 | CIVIC PZ | | 0 | 0 | 0 | 0 | 1 | 1 | 0.2322135 | 0.166666667 | 0.166666667 | 161 | 0.074712644 | 0_50 |
| 668 | DUBLIN BL | | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 162 | 0.068965517 | 0_50 |
| 736 | DUBLIN BL | | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 163 | 0.063218391 | 0_50 |
| 849 | KOHNEN WY | | 0 | 0 | 0 | 0 | 1 | 1 | 0.2406822 | 0.166666667 | 0.166666667 | 164 | 0.057471264 | 0_50 |
| 995 | MARIPOSA CI | | 0 | 0 | 0 | 0 | 1 | 1 | 0.1274 | 0.166666667 | 0.166666667 | 165 | 0.051724138 | 0_50 |
| 1026 | SIERRA CT | | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 166 | 0.045977011 | 0_50 |
| 1182 | PENN DR | | 0 | 0 | 0 | 0 | 1 | 1 | 0.3329521 | 0.166666667 | 0.166666667 | 167 | 0.040229885 | 0_50 |
| 1200 | STAGECOACH RD | | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 168 | 0.034482759 | 0_50 |
| 1282 | STAGECOACH RD | | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 169 | 0.028735632 | 0_50 |
| 1290 | SIERRA LN | | 0 | 0 | 0 | 0 | 1 | 1 | 0.3366714 | 0.166666667 | 0.166666667 | 170 | 0.022988506 | 0_50 |
| 1341 | S MARIPOSA LN | | 0 | 0 | 0 | 0 | 1 | 1 | 0.159664 | 0.166666667 | 0.166666667 | 171 | 0.017241379 | 0_50 |
| 1347 | STAGECOACH RD | | 0 | 0 | 0 | 0 | 1 | 1 | 0.5 | 0.166666667 | 0.166666667 | 172 | 0.011494253 | 0_50 |
| 1362 | WHITWORTH DR | | 0 | 0 | 0 | 0 | 1 | 1 | 0.2065178 | 0.166666667 | 0.166666667 | 173 | 0.005747126 | 0_50 |
| 1490 | UTICA CT | | 0 | 0 | 0 | 0 | 1 | 1 | 0.0663647 | 0.166666667 | 0.166666667 | 174 | 0 | 0_50 |

Attachment B: Collision Database

City-provided database

| Involved With | Bicycle |
|---|---|

| Count of Report No | Column Labels | | | | | | |
|---|---|---|---|---|---|---|---|
| Row Labels | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Grand Total |
| Fatal/Sev | 1 | | 2 | | | | 3 |
| Other | 16 | 12 | 9 | 11 | 8 | 9 | 65 |
| Grand Total | 17 | 12 | 11 | 11 | 8 | 9 | 68 |

| Involved With | Pedestrian |
|---|---|

| Count of Report No | Column Labels | | | | | | |
|---|---|---|---|---|---|---|---|
| Row Labels | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Grand Total |
| Fatal/Sev | 4 | 1 | 2 | 2 | 2 | 1 | 12 |
| Other | 8 | 12 | 8 | 11 | 16 | 14 | 69 |
| Grand Total | 12 | 13 | 10 | 13 | 18 | 15 | 81 |

TIMS Download

| BICYCLE_ACCIDENT | Y |
|---|---|

| Count of CASE_ID | Column Labels | | | | | | |
|---|---|---|---|---|---|---|---|
| Row Labels | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Grand Total |
| Fatal/Sev | 1 | | 2 | | | | 3 |
| Other | 9 | 11 | 9 | 12 | 8 | 10 | 59 |
| Grand Total | 10 | 11 | 11 | 12 | 8 | 10 | 62 |

| PEDESTRIAN_ACCIDENT | Y |
|---|---|

| Count of CASE_ID | Column Labels | | | | | | |
|---|---|---|---|---|---|---|---|
| Row Labels | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Grand Total |
| Fatal/Sev | 3 | 1 | 1 | 2 | 1 | | 8 |
| Other | 7 | 7 | 6 | 10 | 8 | 6 | 44 |
| Grand Total | 10 | 8 | 7 | 12 | 9 | 6 | 52 |

| Report No | Collision date | Collision Ti | Day | Location | Distance | Direction | Lighting | Weather | Collision Type | Involved With | PCF | Hit and Ru | Injury Degi | severity | Injured | Killed | Year | InjuredNun | KilledNumt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D14-00306 | 2014-01-29 | 08:33 | Wednesda | TAMARACK DR - BURTON ST | 100' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-00318 | 2014-01-30 | 16:36 | Thursday | AMADOR VALLEY BL - BURTON ST | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-00769 | 2014-03-13 | 12:17 | Thursday | TOYOTA DR - DUBLIN BL | 6' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-00980 | 2014-04-02 | 13:33 | Wednesda | DUBLIN BL - DUBLIN CT | 242' | Direction: | Daylight | Cloudy | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Severe Inju | 2 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-01226 | 2014-04-23 | 10:06 | Wednesda | TASSAJARA RD - DUBLIN BL | 14' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-02675 | 2014-09-15 | 07:58 | Monday | VILLAGE PW - BRIGHTON DR | 3' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-02703 | 2014-09-17 | 09:54 | Wednesda | LOCUST PL N - WINEBERRY WY | 336' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Severe Inju | 2 | # Inj: 0 | # Killed: 0 | 2014 | 0 | 0 |
| D14-02791 | 2014-09-26 | 10:42 | Friday | BENT TREE DR - TWIN EAGLES LN | 10' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Severe Inju | 2 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-02824 | 2014-09-29 | 15:38 | Monday | VILLAGE PW - LEWIS AV | 50' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Improper Turning | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-02883 | 2014-10-04 | 00:10 | Saturday | ARNOLD RD - DUBLIN BL | 0' | Direction: | Dark - Street Lights | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-03027 | 2014-10-17 | 11:37 | Friday | AMADOR VALLEY BL - REGIONAL ST | 348' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2014 | 1 | 0 |
| D14-03410 | 2014-11-22 | 21:09 | Saturday | DUBLIN BL - REGIONAL ST | 0' | Direction: | Dark - Street Lights | Cloudy | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Severe Inju | 2 | # Inj: 2 | # Killed: 0 | 2014 | 2 | 0 |
| D1500341 | 2015-02-04 | 18:20 | Wednesda | SAN RAMON RD - VOMAC RD | 0' | Direction: | Dark - Street Lights | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Severe Inju | 2 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1500799 | 2015-03-20 | 08:44 | Friday | TAMARACK DR - AMANDA ST | 83' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Other Visit | 3 | # Inj: 2 | # Killed: 0 | 2015 | 2 | 0 |
| D1500864 | 2015-03-25 | 14:51 | Wednesda | VILLAGE PW - BRIGHTON DR | 660' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1501259 | 2015-05-02 | 14:00 | Saturday | BRIDGEPOINTE LN - HARTLAND LN | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1501579 | 2015-06-05 | 11:41 | Friday | SAN RAMON RD - DUBLIN BL | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1501650 | 2015-06-12 | 15:50 | Friday | VILLAGE PW - DUBLIN BL | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2015 | 0 | 0 |
| D1501739 | 2015-06-21 | 19:42 | Sunday | DUBLIN BL - GLYNNIS ROSE DR | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2015 | 0 | 0 |
| D1501807 | 2015-06-29 | 08:50 | Monday | DUBLIN RANCH DR - OAK BLUFF LN | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1502220 | 2015-08-07 | 09:16 | Friday | CHARLTON CT - FOXCROFT WY | 46' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1502301 | 2015-08-15 | 13:04 | Saturday | REGIONAL ST - AMADOR VALLEY BL | 13' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1502700 | 2015-09-23 | 08:25 | Wednesda | VILLAGE PW - AMADOR VALLEY BL | 229' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1502752 | 2015-09-27 | 11:37 | Sunday | REGIONAL ST - SAINT PATRICK WY | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Other Improper Driving | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2015 | 0 | 0 |
| D1503346 | 2015-11-22 | 15:46 | Sunday | VILLAGE PW - TAMARACK DR | 30' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2015 | 1 | 0 |
| D1601088 | 2016-04-19 | 13:31 | Tuesday | DUBLIN BL - CLARK AV | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2016 | 1 | 0 |
| D1601144 | 2016-04-25 | 22:59 | Monday | DUBLIN BL - ARNOLD RD | 0' | Direction: | Dark - Street Lights | Clear | Vehicle - Pedestrian | Pedestrian | Not Stated | Hit & Run: | Fatal | 1 | # Inj: 1 | # Killed: 1 | 2016 | 1 | 1 |
| D1601267 | 2016-05-08 | 01:04 | Sunday | PENN DR - TYNE CT | 0' | Direction: | Dark - Street Lights Not F | Cloudy | Vehicle - Pedestrian | Pedestrian | Not Stated | Hit & Run: | Severe Inju | 2 | # Inj: 2 | # Killed: 0 | 2016 | 2 | 0 |
| D1601647 | 2016-06-13 | 12:29 | Monday | DUBLIN BL - SIERRA CT | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2016 | 1 | 0 |
| D1601861 | 2016-07-01 | 23:31 | Friday | ARNOLD RD - DUBLIN BL | 0' | Direction: | Dark - Street Lights | Clear | Vehicle - Pedestrian | Pedestrian | Not Stated | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2016 | 1 | 0 |
| D1601956 | 2016-07-13 | 10:10 | Wednesda | DUBLIN BL - REGIONAL ST | 26' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2016 | 0 | 0 |
| D1602786 | 2016-09-21 | 14:07 | Wednesda | CANTARA DR - SPAGO DR (N) | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2016 | 1 | 0 |
| D1602817 | 2016-09-24 | 17:24 | Saturday | HACIENDA CROSSING - HACIENDA DR | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2016 | 0 | 0 |
| D1603327 | 2016-11-06 | 17:00 | Sunday | DUBLIN BL - TASSAJARA RD | 12' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2016 | 1 | 0 |
| D1603835 | 2016-12-16 | 17:50 | Friday | AMADOR PLAZA RD - AMADOR VALLEY BL | 0' | Direction: | Dusk - Dawn | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2016 | 0 | 0 |
| D1700553 | 2017-02-17 | 15:49 | Friday | SHADOW DR - SHADOW PL | 150' | Direction: | Daylight | Raining | Vehicle - Pedestrian | Pedestrian | Unsafe Starting or Backing | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2017 | 0 | 0 |
| D1701856 | 2017-06-13 | 09:06 | Tuesday | HACIENDA DR - DUBLIN BL | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Improper Passing | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2017 | 1 | 0 |
| D1702023 | 2017-06-28 | 12:13 | Wednesda | CAMPBELL LN - DUBLIN BL | 12' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2017 | 1 | 0 |
| D1702661 | 2017-08-19 | 16:19 | Saturday | SUTTON LN - CANTERBURY LN (E) | 102' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Auto R/W Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2017 | 1 | 0 |
| D1702791 | 2017-08-30 | 18:58 | Wednesda | ROLLING HILLS DR - WINDING TRAIL LN | 0' | Direction: | Dusk - Dawn | Clear | Vehicle - Pedestrian | Pedestrian | Unsafe Speed | Hit & Run: | Severe Inju | 2 | # Inj: 2 | # Killed: 0 | 2017 | 2 | 0 |
| D1702823 | 2017-09-02 | 18:39 | Saturday | VILLAGE PW - AMADOR VALLEY BL | 0' | Direction: | Dusk - Dawn | Clear | Vehicle - Pedestrian | Pedestrian | Pedestrian Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2017 | 1 | 0 |
| D1702941 | 2017-09-12 | 08:03 | Tuesday | CENTRAL PW - ASPEN ST | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unsafe Speed | Hit & Run: | Other Visit | 3 | # Inj: 2 | # Killed: 0 | 2017 | 2 | 0 |
| D1703065 | 2017-09-20 | 19:55 | Wednesda | IN PARKING LOT OF 4100 GRAFTON - NULL | 0' | Direction: | Dark - Street Lights | Clear | Vehicle - Pedestrian | Pedestrian | Other Improper Driving | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2017 | 1 | 0 |
| D1703166 | 2017-09-28 | 17:58 | Thursday | ANTONE WY - GRAFTON ST | 11' | Direction: | Dusk - Dawn | Clear | Vehicle - Pedestrian | Pedestrian | Unsafe Speed | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2017 | 1 | 0 |
| D1703403 | 2017-10-18 | 09:32 | Wednesda | CENTRAL PW - ASPEN ST | 13' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Pedestrian Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2017 | 1 | 0 |
| D1703793 | 2017-11-21 | 13:40 | Tuesday | DUBLIN BL - GOLDEN GATE DR | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2017 | 1 | 0 |
| D1703974 | 2017-12-04 | 15:50 | Monday | BRIGHTON DR - CALLAN ST | 342' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unsafe Starting or Backing | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2017 | 0 | 0 |
| KAI1 | 2017-12-20 | 20:40 | | HACIENDA & 580, DUBLIN, CA | 86' | Direction: | North | | Vehicle - Pedestrian | Pedestrian | Pedestrian Violatoin | | Fatal | 1 | # Inj: 0 | # Killed: 1 | 2017 | 0 | 1 |
| D1800044 | 2018-01-05 | 06:11 | Friday | TWIN EAGLES LN - BENT TREE DR | 9' | Direction: | Dark - Street Lights | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1800114 | 2018-01-10 | 12:15 | Wednesda | HILLBROOK PL - NULL | 0' | Direction: | Daylight | Cloudy | Vehicle - Pedestrian | Pedestrian | Other Improper Driving | Hit & Run: | Fatal | 1 | # Inj: 0 | # Killed: 1 | 2018 | 0 | 1 |
| D1800168 | 2018-01-12 | 16:56 | Friday | DUBLIN BL - GLYNNIS ROSE DR | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 2 | # Killed: 0 | 2018 | 2 | 0 |
| D1800901 | 2018-03-05 | 08:18 | Monday | PALERMO WY - LOCKHART ST | 8' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Other Hazardous Movement | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1800993 | 2018-03-10 | 17:34 | Saturday | 5200 DUBLIN BLVD-PARKING LOT - NULL | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Other Improper Driving | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1801748 | 2018-05-09 | 14:35 | Wednesda | CENTRAL PW - LEE THOMPSON ST | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Traffic Signals and Signs | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1802496 | 2018-07-10 | 12:47 | Tuesday | DUBLIN BL - CLARK AV | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1802655 | 2018-07-21 | 17:36 | Saturday | BROOKDALE CT - MANSFIELD AV | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Other Improper Driving | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2018 | 0 | 0 |
| D1802760 | 2018-07-29 | 13:19 | Sunday | LAZY DOG P/LOT - NULL | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Other Improper Driving | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2018 | 0 | 0 |
| D1802763 | 2018-07-29 | 14:02 | Sunday | PANDA EXPRESS P/LOT - NULL | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unknown | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1802975 | 2018-08-15 | 11:59 | Wednesda | REGIONAL ST - SAINT PATRICK WY | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Other Improper Driving | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1803146 | 2018-08-27 | 17:14 | Monday | TASSAJARA RD - DUBLIN BL | 708' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Not Stated | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1803168 | 2018-08-29 | 14:13 | Wednesda | ARNOLD RD - MARTINELLI WY | 250' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Unsafe Starting or Backing | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2018 | 0 | 0 |
| D1803740 | 2018-10-11 | 08:00 | Thursday | ANTONE WY - GRAFTON ST | 11' | Direction: | Dusk - Dawn | Clear | Vehicle - Pedestrian | Pedestrian | Other Hazardous Movement | Hit & Run: | Property D | 0 | # Inj: 0 | # Killed: 0 | 2018 | 0 | 0 |
| D1803965 | 2018-10-31 | 08:44 | Wednesda | DUBLIN BL - DUBLIN CT | 0' | Direction: | Dusk - Dawn | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Severe Inju | 2 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1803967 | 2018-10-31 | 08:52 | Wednesda | DUBLIN BL - GLYNNIS ROSE DR | 0' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Other Improper Driving | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1804307 | 2018-11-29 | 15:12 | Thursday | DAVONA DR - WICKLOW LN (N) | 446' | Direction: | Daylight | Cloudy | Vehicle - Pedestrian | Pedestrian | Pedestrian Violation | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1804497 | 2018-12-13 | 15:28 | Thursday | AMADOR VALLEY BL - BURTON ST | 10' | Direction: | Daylight | Clear | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2018 | 1 | 0 |
| D1900808 | 2019-03-02 | 18:34 | Saturday | HIBERNIA DR - DUBLIN BL | 243' | Direction: | Dark - Street Lights | Raining | Vehicle - Pedestrian | Pedestrian | Ped R/W Violation | Hit & Run: | Other Visit | 3 | # Inj: 1 | # Killed: 0 | 2019 | 1 | 0 |
| D1900852 | 2019-03-05 | 23:16 | Tuesday | SIERRA CT - PRIVATE PROPERTY | 0' | Direction: | Dark - Street Lights | Cloudy | Rear-End | Pedestrian | Other Improper Driving | Hit & Run: | Complaint | 4 | # Inj: 1 | # Killed: 0 | 2019 | 1 | 0 |

| Report No | Collision date | Collision Time | Day | Location | Distance | Direction | Lighting | Weather | Collision Type | Involved With | PCF | Hit and Run | Injury Degree | severity | Injured | Killed | Year | Street1 | Street2 | Address | InjuredNumber | KilledNumber |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D14-00229 | 2014-01-22 | 18:21 | Wednesday | DUBLIN BL - DOUGHERTY RD | 0' | Direction: Not Stated | Daylight | Clear | Other | Bicycle | Other | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | DUBLIN BL | DOUGHER | DUBLIN BL | 0 | 0 |
| D14-00842 | 2014-03-17 | 10:15 | Monday | DUBLIN BL - TASSAJARA RD | 365' | Direction: West | Dark - Street Lights | Clear | Other | Bicycle | Unknown | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | DUBLIN BL | TASSAJAR/ | DUBLIN BL | 0 | 0 |
| D14-01146 | 2014-04-16 | 15:35 | Wednesday | HACIENDA DR - CENTRAL PW | 464' | Direction: North | Daylight | Clear | Other | Bicycle | Unsafe Spe | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2014 | HACIENDA | CENTRAL I | HACIENDA | 1 | 0 |
| D14-01364 | 2014-05-08 | 10:30 | Thursday | DUBLIN BL - SIERRA CT | 201' | Direction: East | Daylight | Cloudy | Other | Bicycle | Improper T | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | DUBLIN BL | SIERRA CT | DUBLIN BL | 0 | 0 |
| D14-01373 | 2014-05-08 | 19:00 | Thursday | DUBLIN BL - CLARINBRIDGE CI | 0' | Direction: Not Stated | Daylight | Clear | Other | Bicycle | Improper T | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | DUBLIN BL | CLARINBR | DUBLIN BL | 0 | 0 |
| D14-01900 | 2014-06-25 | 15:08 | Wednesday | DUBLIN BL - SCARLETT DR | 0' | Direction: West | Daylight | Clear | Broadside | Bicycle | Unknown | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2014 | DUBLIN BL | SCARLETT | DUBLIN BL | 1 | 0 |
| D14-02193 | 2014-07-23 | 19:24 | Wednesday | DUBLIN BL - SAN RAMON RD | 10' | Direction: West | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | DUBLIN BL | SAN RAM( | DUBLIN BL | 0 | 0 |
| D14-02228 | 2014-07-26 | 16:56 | Saturday | DUBLIN BL - HIBERNIA DR | 16' | Direction: East | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2014 | DUBLIN BL | HIBERNIA | DUBLIN BL | 1 | 0 |
| D14-02255 | 2014-07-30 | 06:51 | Wednesday | DUBLIN BL - ARNOLD RD | 0' | Direction: Not Stated | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Fatal | 1 | # Inj: 0 | # Killed: 1 | 2014 | DUBLIN BL | ARNOLD R | DUBLIN BL | 0 | 1 |
| D14-02634 | 2014-09-10 | 17:26 | Wednesday | DUBLIN BL - SAN RAMON RD | 100' | Direction: West | Daylight | Clear | Other | Bicycle | Unsafe Sta | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2014 | DUBLIN BL | SAN RAM( | DUBLIN BL | 1 | 0 |
| D14-02645 | 2014-09-11 | 15:23 | Thursday | LANCASTER RD - UTICA CT | 40' | Direction: East | Daylight | Clear | Other | Bicycle | Other | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | LANCASTEI | UTICA CT | LANCASTEI | 0 | 0 |
| D14-02674 | 2014-09-15 | 07:23 | Monday | VILLAGE PW - BRIGHTON DR | 464' | Direction: North | Daylight | Clear | Other | Bicycle | Improper T | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2014 | VILLAGE P\ | BRIGHTON | VILLAGE P\ | 1 | 0 |
| D14-02867 | 2014-10-03 | 08:23 | Friday | BRIGHTON DR - AMADOR VALLEY BL | 11' | Direction: North | Daylight | Cloudy | Other | Bicycle | Improper T | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | BRIGHTON | AMADOR ' | BRIGHTON | 0 | 0 |
| D14-03065 | 2014-10-21 | 07:25 | Tuesday | DUBLIN BL - VILLAGE PW | 0' | Direction: Not Stated | Daylight | Clear | Other | Bicycle | Unknown | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | DUBLIN BL | VILLAGE P | DUBLIN BL | 0 | 0 |
| D14-03230 | 2014-11-07 | 08:07 | Friday | BENT TREE DR - TWIN EAGLES LN | 7' | Direction: West | Daylight | Clear | Other | Bicycle | Improper T | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2014 | BENT TREE | TWIN EAG | BENT TREE | 1 | 0 |
| D14-03634 | 2014-12-16 | 17:19 | Tuesday | AMADOR PLAZA RD - AMADOR VALLEY BL | 0' | Direction: Not Stated | Dark - Street Lights | Raining | Other | Bicycle | Auto R/W \ | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2014 | AMADOR F | AMADOR ' | AMADOR F | 0 | 0 |
| D14-03679 | 2014-12-20 | 11:01 | Saturday | DUBLIN BL - CLARK AV | 256' | Direction: East | Daylight | Cloudy | Other | Bicycle | Auto R/W \ | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2014 | DUBLIN BL | CLARK AV | DUBLIN BL | 1 | 0 |
| D1500727 | 2015-03-13 | 16:47 | Friday | BRANNIGAN ST - WHITWORTH DR | 125' | Direction: South | Daylight | Clear | Other | Bicycle | Improper F | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2015 | BRANNIGA | WHITWOF | BRANNIGA | 0 | 0 |
| D1500839 | 2015-03-23 | 12:14 | Monday | VILLAGE PW - TAMARACK DR | 16' | Direction: South | Daylight | Clear | Other | Bicycle | Other Haza | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2015 | VILLAGE P\ | TAMARAC | VILLAGE P\ | 1 | 0 |
| D1500979 | 2015-04-06 | 06:48 | Monday | DUBLIN BL - HIBERNIA DR | 10' | Direction: West | Daylight | Clear | Other | Bicycle | Improper T | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2015 | DUBLIN BL | HIBERNIA | DUBLIN BL | 1 | 0 |
| D1501144 | 2015-04-23 | 12:02 | Thursday | SIERRA LN - DOUGHERTY RD | 2' | Direction: West | Daylight | Clear | Other | Bicycle | Not Stated | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2015 | SIERRA LN | DOUGHER | SIERRA LN | 0 | 0 |
| D1501277 | 2015-05-07 | 11:23 | Thursday | CENTRAL PW - BRANNIGAN ST | 13' | Direction: East | Daylight | Cloudy | Other | Bicycle | Traffic Sign | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2015 | CENTRAL P | BRANNIGA | CENTRAL P | 1 | 0 |
| D1502206 | 2015-08-05 | 16:54 | Wednesday | REGIONAL ST - AMADOR VALLEY BL | 0' | Direction: South | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2015 | REGIONAL | AMADOR ' | REGIONAL | 1 | 0 |
| D1502258 | 2015-08-11 | 12:29 | Tuesday | ARNOLD RD - DUBLIN BL | 10' | Direction: North | Daylight | Clear | Other | Bicycle | Not Stated | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2015 | ARNOLD RI | DUBLIN BL | ARNOLD RI | 1 | 0 |
| D1502360 | 2015-08-21 | 19:12 | Friday | CENTRAL PW - TASSAJARA RD | 0' | Direction: Not Stated | Daylight | Clear | Other | Bicycle | Unsafe Sta | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2015 | CENTRAL P | TASSAJAR/ | CENTRAL P | 1 | 0 |
| D1502467 | 2015-08-31 | 15:59 | Monday | VILLAGE PW - BRIGHTON DR | 0' | Direction: North | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Other Visible Injury | 3 | # Inj: 2 | # Killed: 0 | 2015 | VILLAGE P\ | BRIGHTON | VILLAGE P\ | 2 | 0 |
| D1502478 | 2015-09-01 | 11:07 | Tuesday | DUBLIN BL - AMADOR PLAZA RD | 226' | Direction: East | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2015 | DUBLIN BL | AMADOR ' | DUBLIN BL | 0 | 0 |
| D1502560 | 2015-09-09 | 07:57 | Wednesday | GRAFTON ST - GLEASON DR | 0' | Direction: Not Stated | Daylight | Clear | Broadside | Bicycle | Other Haza | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2015 | GRAFTON S | GLEASON | GRAFTON S | 1 | 0 |
| D1503570 | 2015-12-14 | 15:10 | Monday | GRAFTON ST - CAPOTERRA WY | 0' | Direction: Not Stated | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2015 | GRAFTON S | CAPOTERF | GRAFTON S | 0 | 0 |
| D1600257 | 2016-01-27 | 08:28 | Wednesday | KOHNEN WY - SHELTON ST | 255' | Direction: West | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2016 | KOHNEN W | SHELTON ! | KOHNEN W | 0 | 0 |
| D1600466 | 2016-02-17 | 07:51 | Wednesday | VILLAGE PW - BRIGHTON DR | 667' | Direction: North | Daylight | Cloudy | Broadside | Bicycle | Ped R/W V | Hit & Run: | Severe Injury | 2 | # Inj: 1 | # Killed: 0 | 2016 | VILLAGE P\ | BRIGHTON | VILLAGE P\ | 1 | 0 |
| D1600987 | 2016-04-09 | 15:07 | Saturday | ARNOLD RD - DUBLIN BL | 0' | Direction: Not Stated | Daylight | Cloudy | Broadside | Bicycle | Other Haza | Hit & Run: | Severe Injury | 2 | # Inj: 1 | # Killed: 0 | 2016 | ARNOLD RI | DUBLIN BL | ARNOLD RI | 1 | 0 |
| D1601081 | 2016-04-18 | 17:54 | Monday | VILLAGE PW - DUBLIN BL | 181' | Direction: North | Daylight | Clear | Other | Bicycle | Other Haza | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2016 | VILLAGE P\ | DUBLIN BL | VILLAGE P\ | 1 | 0 |
| D1601453 | 2016-05-27 | 08:06 | Friday | DUBLIN BL - CLARK AV | 413' | Direction: East | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2016 | DUBLIN BL | CLARK AV | DUBLIN BL | 1 | 0 |
| D1602413 | 2016-08-23 | 19:48 | Tuesday | CENTRAL PW - HACIENDA DR | 0' | Direction: Not Stated | Dusk - Dawn | Clear | Other | Bicycle | Other Haza | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2016 | CENTRAL P | HACIENDA | CENTRAL P | 0 | 0 |
| D1602435 | 2016-08-25 | 20:55 | Thursday | CENTRAL PW - HACIENDA DR | 0' | Direction: Not Stated | Dark - Street Lights | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2016 | CENTRAL P | HACIENDA | CENTRAL P | 1 | 0 |
| D1602575 | 2016-09-07 | 13:18 | Wednesday | HASTINGS WY - VILLAGE PW | 5' | Direction: West | Daylight | Clear | Other | Bicycle | Not Stated | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2016 | HASTINGS | VILLAGE P | HASTINGS | 1 | 0 |
| D1603410 | 2016-11-14 | 17:54 | Monday | DUBLIN BL - FALLON RD | 0' | Direction: Not Stated | Dusk - Dawn | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2016 | DUBLIN BL | FALLON RI | DUBLIN BL | 1 | 0 |
| D1603859 | 2016-12-18 | 18:56 | Sunday | AMADOR VALLEY BL - VILLAGE PW | 262' | Direction: East | Dark - No Street Lights | Clear | Other | Bicycle | Unsafe Lan | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2016 | AMADOR \ | VILLAGE P | AMADOR \ | 1 | 0 |
| D1603961 | 2016-12-27 | 11:35 | Tuesday | MARIPOSA CI - MARIPOSA LN (N) | 16' | Direction: West | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2016 | MARIPOSA | MARIPOS/ | MARIPOSA | 0 | 0 |
| D1701223 | 2017-04-14 | 07:24 | Friday | PENN DR - LANCASTER RD | 87' | Direction: North | Daylight | Clear | Other | Bicycle | Improper T | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2017 | PENN DR | LANCASTE | PENN DR & | 0 | 0 |
| D1701352 | 2017-04-27 | 07:31 | Thursday | STAGECOACH RD - AMADOR VALLEY BL | 11' | Direction: South | Daylight | Clear | Other | Bicycle | Not Stated | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2017 | STAGECOA | AMADOR ' | STAGECOA | 0 | 0 |
| D1701386 | 2017-04-29 | 10:58 | Saturday | DUBLIN BL - SIERRA CT | 775' | Direction: East | Daylight | Clear | Other | Bicycle | Improper T | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2017 | DUBLIN BL | SIERRA CT | DUBLIN BL | 0 | 0 |
| D1701587 | 2017-05-19 | 08:52 | Friday | VILLAGE PW - BRIGHTON DR | 200' | Direction: North | Daylight | Clear | Rear-End | Bicycle | Brakes | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2017 | VILLAGE P\ | BRIGHTON | VILLAGE P\ | 1 | 0 |
| D1701708 | 2017-05-30 | 16:20 | Tuesday | VILLAGE PW - DAVONA DR | 0' | Direction: Not Stated | Daylight | Clear | Broadside | Bicycle | Not Stated | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2017 | VILLAGE P\ | DAVONA [ | VILLAGE P\ | 1 | 0 |
| D1701872 | 2017-06-14 | 10:04 | Wednesday | DUBLIN BL - GLYNNIS ROSE DR | 257' | Direction: East | Daylight | Clear | Other | Bicycle | Not Stated | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2017 | DUBLIN BL | GLYNNIS F | DUBLIN BL | 1 | 0 |
| D1701951 | 2017-06-22 | 09:11 | Thursday | DUBLIN BL - SIERRA CT | 520' | Direction: West | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2017 | DUBLIN BL | SIERRA CT | DUBLIN BL | 1 | 0 |
| D1702185 | 2017-07-11 | 18:17 | Tuesday | CLARK AV - DUBLIN BL | 0' | Direction: Not Stated | Daylight | Clear | Other | Bicycle | Not Stated | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2017 | CLARK AV | DUBLIN BL | CLARK AV & | 1 | 0 |
| D1703245 | 2017-10-05 | 08:30 | Thursday | ASPEN ST - SUMMER GLEN DR | 5' | Direction: South | Daylight | Clear | Other | Bicycle | Unsafe Spe | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2017 | ASPEN ST | SUMMER | ASPEN ST & | 1 | 0 |
| D1704003 | 2017-12-06 | 15:31 | Wednesday | AMADOR VALLEY BL - VILLAGE PW | 115' | Direction: East | Dusk - Dawn | Clear | Other | Bicycle | Other Haza | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2017 | AMADOR \ | VILLAGE P | AMADOR \ | 1 | 0 |
| D1704208 | 2017-12-21 | 09:58 | Thursday | DUBLIN BL - CLARK AV | 560' | Direction: East | Daylight | Clear | Other | Bicycle | Auto R/W \ | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2017 | DUBLIN BL | CLARK AV | DUBLIN BL | 0 | 0 |
| D1800712 | 2018-02-19 | 07:44 | Monday | AMADOR VALLEY BL - REGIONAL ST | 18' | Direction: West | Daylight | Clear | Other | Bicycle | Other Haza | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2018 | AMADOR \ | REGIONAL | AMADOR \ | 1 | 0 |
| D1801394 | 2018-04-11 | 21:30 | Wednesday | DUBLIN BL - AMADOR PLAZA RD | 26' | Direction: East | Dark - Street Lights | Raining | Other | Bicycle | Traffic Sign | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2018 | DUBLIN BL | AMADOR ' | DUBLIN BL | 0 | 0 |
| D1801564 | 2018-04-25 | 15:34 | Wednesday | VILLAGE PW - DUBLIN BL | 193' | Direction: North | Daylight | Clear | Head-On | Bicycle | Not Stated | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2018 | VILLAGE P\ | DUBLIN BL | VILLAGE P\ | 0 | 0 |
| D1802458 | 2018-07-06 | 21:54 | Friday | DUBLIN BL - SAN RAMON RD | 363' | Direction: West | Dark - Street Lights | Clear | Rear-End | Bicycle | Improper T | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2018 | DUBLIN BL | SAN RAM( | DUBLIN BL | 1 | 0 |
| D1802730 | 2018-07-27 | 16:44 | Friday | DUBLIN BL - HACIENDA DR | 303' | Direction: West | Daylight | Clear | Sideswipe | Bicycle | Improper T | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2018 | DUBLIN BL | HACIENDA | DUBLIN BL | 1 | 0 |
| D1803532 | 2018-09-26 | 15:19 | Wednesday | VOMAC RD - SAN RAMON RD | 2' | Direction: Not Stated | Daylight | Clear | Broadside | Bicycle | Auto R/W \ | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2018 | VOMAC RD | SAN RAM( | VOMAC RD | 1 | 0 |
| D1803553 | 2018-09-28 | 08:01 | Friday | GLEASON DR - GRAFTON ST | 7' | Direction: East | Daylight | Clear | Broadside | Bicycle | Traffic Sign | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2018 | GLEASON [ | GRAFTON | GLEASON [ | 0 | 0 |
| D1804463 | 2018-12-11 | 08:19 | Tuesday | VALENTANO DR - FORINO DR | 6' | Direction: East | Daylight | Clear | Broadside | Bicycle | Traffic Sign | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2018 | VALENTAN | FORINO D | VALENTAN | 1 | 0 |
| D1900667 | 2019-02-20 | 13:13 | Wednesday | VILLAGE PW - TAMARACK DR | 0' | Direction: Not Stated | Daylight | Cloudy | Broadside | Bicycle | Other Haza | Hit & Run: | Property Damage Only | 0 | # Inj: 0 | # Killed: 0 | 2019 | VILLAGE P\ | TAMARAC | VILLAGE P\ | 0 | 0 |
| D1901126 | 2019-03-24 | 12:16 | Sunday | AMADOR VALLEY BL - VILLAGE PW | 212' | Direction: West | Daylight | Clear | Broadside | Bicycle | Improper T | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2019 | AMADOR \ | VILLAGE P | AMADOR \ | 1 | 0 |
| D1901652 | 2019-05-04 | 18:13 | Saturday | VILLAGE PW - TAMARACK DR | 0' | Direction: Not Stated | Daylight | Clear | Other | Bicycle | Not Stated | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2019 | VILLAGE P\ | TAMARAC | VILLAGE P\ | 1 | 0 |
| D1902063 | 2019-06-06 | 21:55 | Thursday | ASTERWOOD DR - REDWOOD AV | 0' | Direction: Not Stated | Dark - Street Lights | Clear | Broadside | Bicycle | Ped R/W V | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2019 | ASTERWO( | REDWOOI | ASTERWO( | 1 | 0 |
| D1903850 | 2019-10-24 | 07:23 | Thursday | IRONHORSE PW - DUBLIN BL | 329' | Direction: South | Daylight | Clear | Broadside | Bicycle | Ped R/W V | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2019 | IRONHORS | DUBLIN BL | IRONHORS | 1 | 0 |
| D1904425 | 2019-12-08 | 18:10 | Sunday | FALLON RD - POSITANO PW | 210' | Direction: South | Dark - Street Lights | Clear | Sideswipe | Bicycle | Unknown | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2019 | FALLON RD | POSITANO | FALLON RD | 1 | 0 |
| D1904431 | 2019-12-09 | 08:17 | Monday | AMADOR VALLEY BL - STAGECOACH RD | 480' | Direction: West | Daylight | Fog | Sideswipe | Bicycle | Auto R/W \ | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2019 | AMADOR \ | STAGECOA | AMADOR \ | 1 | 0 |
| D1904502 | 2019-12-13 | 18:11 | Friday | DUBLIN BL - VILLAGE | 0' | Direction: Not Stated | Dark - Street Lights | Raining | Broadside | Bicycle | Not Stated | Hit & Run: | Other Visible Injury | 3 | # Inj: 1 | # Killed: 0 | 2019 | DUBLIN BL | VILLAGE | DUBLIN BL | 1 | 0 |
| D1904624 | 2019-12-23 | 19:00 | Monday | DUBLIN BL - FALLON GATEWAY | 0' | Direction: Not Stated | Dark - Street Lights | Clear | Broadside | Bicycle | Not Stated | Hit & Run: | Complaint of Pain | 4 | # Inj: 1 | # Killed: 0 | 2019 | DUBLIN BL | FALLON G | DUBLIN BL | 1 | 0 |

| CASE_ID | ACCIDENT_YEAR | PROC_DATE | JURIS | COLLISION_DATE | COLLISION_TIME | OFFICER_ID | REPORTING_DISTRICT | DAY_OF_WEEK | CHP_SHIFT | POPULATION | CNTY_CITY_LOC | SPECIAL_COND | BEAT_TYPE | CHP_BEAT_TYPE | CITY_DIVISION_LAPD | CHP_BEAT_CLASS | BEAT_NUMBER | PRIMARY_RD | SECONDARY_RD | DISTANCE | DIRECTION | INTERSECTION | WEATHER_1 | WEATHER_2 | STATE_HWY_IND | CALTRANS_COUNTY | CALTRANS_DISTRICT | STATE_ROUTE | ROUTE_SUFFIX | POSTMILE_PREFIX | POSTMILE | LOCATION_TYPE | RAMP_INTERSECTION | SIDE_OF_HWY | TOW_AWAY | COLLISION_SEVERITY | NUMBER_KILLED | NUMBER_INJURED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6363339 | 2014 | 6/11/2014 | 100 | 1/30/2014 | 1636 | 203174 | 322 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | BURTON ST | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 6397006 | 2014 | 10/13/2015 | 100 | 1/29/2014 | 833 | 203240 | 304 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NOVALU | TAMARACK DR | BURTON ST | 100 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 6423660 | 2014 | 6/24/2014 | 100 | 3/20/2014 | 1712 | 1 | | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | BRODER BL | MADIGAN RD | 750 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 6460407 | 2014 | 7/10/2014 | 100 | 4/2/2014 | 1333 | 202219 | 207 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | AMADOR PLAZA RD | 4 | W | N | B | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6475283 | 2014 | 7/24/2014 | 100 | 4/16/2014 | 1535 | 202219 | 406 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | HACIENDA DR | CENTRAL PKWY | 464 | N | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6475287 | 2014 | 7/24/2014 | 100 | 4/23/2014 | 1006 | 100411 | 501 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | TASSAJARA RD | DUBLIN BL | 14 | N | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6541933 | 2014 | 8/28/2014 | 100 | 7/26/2014 | 1656 | 202219 | 410 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | HIBERNIA DR | 16 | E | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6606255 | 2014 | 10/7/2014 | 100 | 7/30/2014 | 651 | 201242 | 408 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | ARNOLD RD | 0 | | Y | A | - | N | | | | | | | | | | Y | 1 | 1 | 0 |
| 6646294 | 2014 | 10/10/2014 | 100 | 9/17/2014 | 954 | 202219 | 325 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | LOCUST PL | WINEBERRY WY | 336 | N | N | A | - | N | | | | | | | | | | N | 2 | 0 | 1 |
| 6646298 | 2014 | 10/10/2014 | 100 | 9/15/2014 | 723 | 100411 | 301 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PKWY | BRIGHTON DR | 464 | N | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6669800 | 2014 | 11/7/2014 | 100 | 9/26/2014 | 1042 | 201242 | 507 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | BENT TREE DR | TWIN EAGLES LN | 10 | S | N | A | - | N | | | | | | | | | | N | 2 | 0 | 1 |
| 6679695 | 2014 | 1/28/2015 | 100 | 9/15/2014 | 758 | 203240 | 301 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | VILLAGE PW | BRIGHTON DR | 3 | N | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6684186 | 2014 | 12/19/2014 | 100 | 10/16/2014 | 1531 | 202219 | 0 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | BRANNIGAN ST | GLEASON DR | 8 | N | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6684190 | 2014 | 12/19/2014 | 100 | 10/17/2014 | 1137 | 201242 | 207 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | REGIONAL ST | 348 | E | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 6684194 | 2014 | 12/19/2014 | 100 | 10/4/2014 | 10 | 202085 | 408 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | ARNOLD RD | DUBLIN BL | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 6691789 | 2014 | 11/20/2014 | 100 | 9/11/2014 | 1523 | 202219 | 322 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | LANCASTER RD | UTICA CT | 40 | E | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6713339 | 2014 | 1/9/2015 | 100 | 11/7/2014 | 807 | 203633 | 507 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | BENT TREE DR | TWIN EAGLES LN | 7 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6718683 | 2017 | 4/8/2019 | 100 | 12/20/2017 | 2040 | 224 | | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | HACIENDA DR | RT 580 | 86 | N | N | A | - | Y | ALA | 4 | 580 | - | - | 18.001 | R | 4 | W | Y | 1 | 1 | 0 |
| 6748044 | 2014 | 1/26/2015 | 100 | 11/22/2014 | 2109 | 203263 | 208 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NOVALU | DUBLIN BL | REGIONAL ST | 0 | | Y | B | - | N | | | | | | | | | | N | 2 | 0 | 2 |
| 6759034 | 2014 | 1/26/2015 | 100 | 11/26/2014 | 1049 | 201242 | 308 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DARIAN CT | BRIGHTON DR | 7 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6776929 | 2014 | 2/12/2015 | 100 | 12/20/2014 | 1101 | 101974 | 0 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NOVALU | DUBLIN BL | CLARK AV | 256 | E | N | B | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6858267 | 2015 | 4/2/2015 | 100 | 2/4/2015 | 1820 | 202219 | 0 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | SAN RAMON RD | VOMAC RD | 0 | | Y | A | - | N | | | | | | | | | | N | 2 | 0 | 1 |
| 6877336 | 2015 | 4/15/2015 | 100 | 3/25/2015 | 1451 | 201242 | 301 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PW | BRIGHTON DR | 660 | N | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 6892456 | 2015 | 4/30/2015 | 100 | 3/13/2015 | 1647 | 203271 | 1 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | BRANNIGAN ST | WHITWORTH DR | 125 | S | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6892458 | 2015 | 4/30/2015 | 100 | 3/23/2015 | 1214 | 100411 | 310 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PKWY | TAMARACK DR | 16 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 6895862 | 2015 | 5/22/2015 | 100 | 3/20/2015 | 844 | 202219 | 316 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | TAMARACK DR | AMANDA ST | 83 | E | N | A | - | N | | | | | | | | | | N | 4 | 0 | 2 |
| 6896523 | 2015 | 5/15/2015 | 100 | 4/6/2015 | 648 | 100411 | 410 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | HIBERNIA DR | 10 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 6896535 | 2015 | 5/15/2015 | 100 | 4/23/2015 | 1202 | 201242 | 411 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | SIERRA LN | DOUGHERTY RD | 2 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6926041 | 2015 | 6/1/2015 | 100 | 5/7/2015 | 1123 | 201242 | 504 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | CENTRAL PKWY | BRANNIGAN ST | 13 | E | N | B | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 6978936 | 2015 | 7/7/2015 | 100 | 6/5/2015 | 1141 | 201242 | 210 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | SAN RAMON RD | DUBLIN BL | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 7002092 | 2015 | 7/22/2015 | 100 | 6/29/2015 | 850 | 202964 | 510 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | N DUBLIN RANCH DR | OAK BLUFF LN | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 7038764 | 2015 | 9/3/2015 | 100 | 8/5/2015 | 1654 | 202219 | 207 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | REGIONAL ST | AMADOR VALLEY BL | 0 | S | - | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 7045238 | 2015 | 9/9/2015 | 100 | 8/15/2015 | 1304 | 206359 | 207 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | REGIONAL ST | AMADOR VALLEY BL | 13 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 7047085 | 2015 | 9/19/2015 | 100 | 8/31/2015 | 1559 | 202219 | 301 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PKWY | BRIGHTON DR | 0 | N | N | A | - | N | | | | | | | | | | N | 4 | 0 | 2 |
| 7057301 | 2015 | 11/13/2015 | 100 | 9/9/2015 | 757 | 100411 | 517 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | GRAFTON ST | GLEASON DR | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 7064786 | 2015 | 9/22/2015 | 100 | 9/1/2015 | 1107 | 201242 | 207 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | AMADOR PLAZA RD | 226 | E | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 7066429 | 2015 | 9/23/2015 | 100 | 8/21/2015 | 1912 | 201721 | 501 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | CENTRAL PKWY | TASSAJARA RD | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 7123085 | 2015 | 12/2/2015 | 100 | 9/23/2015 | 825 | 100411 | 312 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PW | AMADOR VALLEY BL | 229 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 7132019 | 2015 | 12/9/2015 | 100 | 11/22/2015 | 1546 | 202964 | 310 | 7 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PW | TAMARACK DR | 30 | E | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 7148992 | 2015 | 2/3/2016 | 100 | 12/14/2015 | 1510 | 202964 | 516 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | GRAFTON ST | CAPOTERRA WY | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 7187881 | 2016 | 2/22/2016 | 100 | 1/27/2016 | 828 | 100411 | 515 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | KOHNEN WY | SHELTON ST | 255 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 7199634 | 2016 | 9/25/2018 | 100 | 4/25/2016 | 2259 | 202219 | 408 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | DUBLIN BL | ARNOLD RD | 0 | | Y | A | - | N | | | | | | | | | | Y | 1 | 1 | 1 |
| 7207981 | 2016 | 3/21/2016 | 100 | 2/17/2016 | 751 | 202219 | 301 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PW | BRIGHTON DR | 667 | N | N | B | - | N | | | | | | | | | | N | 2 | 0 | 1 |
| 8000919 | 2016 | 3/30/2016 | 100 | 2/27/2016 | 1112 | 203271 | 207 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | AMADOR PLAZA  RD | 223 | E | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8026971 | 2016 | 4/27/2016 | 100 | 4/19/2016 | 1331 | 202219 | 318 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | CLARK AV | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8038919 | 2016 | 5/16/2016 | 100 | 4/9/2016 | 1507 | 202219 | 408 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | ARNOLD RD | DUBLIN BL | 0 | | Y | A | - | N | | | | | | | | | | Y | 2 | 0 | 1 |
| 8040489 | 2016 | 5/19/2016 | 100 | 4/18/2016 | 1754 | 202964 | 312 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PKWY | DUBLIN BL | 181 | N | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8057436 | 2016 | 6/13/2016 | 100 | 5/27/2016 | 806 | 202219 | 320 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NOVALU | DUBLIN BL | CLARK AV | 413 | E | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8082082 | 2016 | 7/15/2016 | 100 | 6/29/2016 | 2051 | 202219 | 0 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VOMAC RD | LANDALE AV | 90 | N | N | A | - | N | | | | | | | | | | Y | 4 | 0 | 1 |
| 8089931 | 2016 | 10/20/2016 | 100 | 8/25/2016 | 2055 | 201730 | 412 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | CENTRAL PKWY | HACIENDA DR | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8091427 | 2016 | 7/29/2016 | 100 | 7/13/2016 | 1010 | 202219 | 208 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | REGIONAL ST | 26 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8092200 | 2016 | 8/3/2016 | 100 | 6/26/2016 | 948 | 201236 | 212 | 7 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | SAN RAMON RD | VOMAC RD | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8097043 | 2016 | 8/12/2016 | 100 | 7/1/2016 | 2331 | 201730 | 408 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | ARNOLD RD | DUBLIN BL | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8113234 | 2016 | 9/7/2016 | 100 | 8/13/2016 | 852 | 202219 | 207 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | STARWARD DR | 81 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8148040 | 2016 | 10/18/2016 | 100 | 9/21/2016 | 1407 | 202219 | 0 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NOVALU | E CANTANA DR | S SPAGE DR | 0 | | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8165468 | 2016 | 11/14/2016 | 100 | 11/6/2016 | 1700 | 203438 | 0 | 7 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | DUBLIN BL | TASSAJARA RD | 12 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8191866 | 2016 | 12/21/2016 | 100 | 11/14/2016 | 1754 | 202964 | 519 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | FALLON RD | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8205673 | 2016 | 1/13/2017 | 100 | 12/18/2016 | 1856 | 202964 | 313 | 7 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | VILLAGE PW | 262 | E | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8316684 | 2017 | 3/6/2017 | 100 | 2/17/2017 | 1549 | 202219 | 203 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | SHADOW DR | SHADOW PL | 150 | W | N | C | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8358065 | 2017 | 5/2/2017 | 100 | 4/14/2017 | 724 | 202219 | 0 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | PENN DR | LANCASTER RD | 87 | N | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8363793 | 2017 | 5/18/2017 | 100 | 4/29/2017 | 1058 | 202219 | 321 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | SIERRA CT | 775 | E | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8363809 | 2017 | 5/18/2017 | 100 | 4/27/2017 | 731 | 202219 | 314 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | STAGECOACH RD | AMADOR VALLEY BL | 11 | S | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8386199 | 2017 | 7/11/2017 | 100 | 5/31/2017 | 1900 | 206805 | 0 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | CENTRAL PKWY | TASSAJARA CREEK TRL | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8391055 | 2017 | 6/28/2017 | 100 | 5/30/2017 | 1620 | 203264 | 310 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PKWY | DAVONA DR | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8391063 | 2017 | 6/28/2017 | 100 | 5/19/2017 | 852 | 203264 | 301 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PW | BRIGHTON DR | 200 | N | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8399630 | 2017 | 7/31/2017 | 100 | 6/14/2017 | 1004 | 202219 | 0 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | GLYNNIS ROSE DR | 257 | E | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8400056 | 2017 | 8/15/2017 | 100 | 6/13/2017 | 906 | 100411 | 412 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | HACIENDA DR | DUBLIN BL | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8402990 | 2017 | 7/12/2017 | 100 | 6/22/2017 | 911 | 206730 | 321 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | SIERRA CT | 520 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8403328 | 2017 | 7/12/2017 | 100 | 6/28/2017 | 1213 | 202219 | 416 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | CAMPBELL LN | DUBLIN BL | 12 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8429817 | 2017 | 8/24/2017 | 100 | 7/11/2017 | 1817 | 207824 | 318 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | CLARK AV | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8436902 | 2017 | 9/21/2017 | 100 | 9/2/2017 | 1839 | 206403 | 313 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PKWY | AMADOR VALLEY BL | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8457978 | 2017 | 10/9/2017 | 100 | 9/12/2017 | 803 | 100411 | 413 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | CENTRAL PKWY | ASPEN ST | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 2 |
| 8466761 | 2017 | 10/13/2017 | 100 | 8/30/2017 | 1858 | 202219 | 0 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | ROLLING HILLS DR | WINDING TRAIL LN | 0 | | Y | A | - | N | | | | | | | | | | Y | 2 | 0 | 2 |
| 8469845 | 2017 | 11/9/2017 | 100 | 8/19/2017 | 1619 | 207824 | 330 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | SUTTON LA | CANTERBURY LN | 102 | S | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8477284 | 2017 | 10/24/2017 | 100 | 10/5/2017 | 830 | 203264 | 400 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | ASPEN ST | SUMMER GLEN DR | 5 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8489136 | 2017 | 12/4/2017 | 100 | 10/18/2017 | 932 | 100411 | 413 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | CENTRAL PKWY | ASPEN ST | 0 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8494507 | 2017 | 11/27/2017 | 100 | 9/28/2017 | 1758 | 207353 | 511 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | ANTONE WY | GRAFTON ST | 11 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8508852 | 2017 | 12/12/2017 | 100 | 11/21/2017 | 1340 | 202219 | 208 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | GOLDEN GATE DR | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8512807 | 2017 | 1/29/2018 | 100 | 12/6/2017 | 1531 | 202219 | 313 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | VILLAGE PW | 115 | E | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8538927 | 2017 | 1/30/2018 | 100 | 12/4/2017 | 1550 | 100411 | 301 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | BRIGHTON DR | CALLAN ST | 342 | E | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8539371 | 2018 | 2/1/2018 | 100 | 1/5/2018 | 611 | 207519 | 507 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | TWIN EAGLES WAYS | BENT TREE DR | 9 | N | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8540665 | 2017 | 1/27/2018 | 100 | 12/21/2017 | 958 | 100411 | 324 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | CLARK AV | 560 | E | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8542669 | 2018 | 2/5/2018 | 100 | 1/12/2018 | 1656 | 203253 | 414 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NOVALU | DUBLIN BL | GLYNNIS ROSE DR | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 2 |
| 8560839 | 2018 | 3/13/2018 | 100 | 2/10/2018 | 1247 | 202219 | 0 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NOVALU | FALLON RD | DUBLIN BL | 544 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8584261 | 2018 | 3/29/2018 | 100 | 2/19/2018 | 744 | 103202 | 207 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | REGIONAL ST | 18 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8584284 | 2018 | 4/5/2018 | 100 | 3/5/2018 | 818 | 400411 | 0 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | PALERMO WY | LOCKHART ST | 8 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8613829 | 2018 | 4/24/2018 | 100 | 4/3/2018 | 1653 | 203628 | 0 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | DUBLIN BL | GOLDEN GATE DR | 498 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8621657 | 2018 | 5/29/2018 | 100 | 4/25/2018 | 1534 | 203264 | 312 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PW | DUBLIN BL | 193 | N | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8625261 | 2018 | 5/30/2018 | 100 | 5/9/2018 | 1435 | 202219 | 0 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | CENTRAL PKWY | LEE THOMPSON WY | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8668416 | 2018 | 8/7/2018 | 100 | 7/10/2018 | 1247 | 100411 | 318 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | DUBLIN BL | CLARK AV | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8679053 | 2018 | 8/30/2018 | 100 | 7/27/2018 | 1644 | 202219 | 410 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | HACIENDA DR | 303 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8690884 | 2018 | 9/25/2018 | 100 | 8/27/2018 | 1714 | 104423 | | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NOVALE | TASSAJARA RD | DUBLIN BL | 708 | N | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8719717 | 2018 | 10/23/2018 | 100 | 9/26/2018 | 1519 | 202219 | 212 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | W VOMAC RD | SAN RAMON RD | 2 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8733346 | 2018 | 12/4/2018 | 100 | 10/31/2018 | 844 | 202219 | 0 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | DUBLIN CT | 0 | | Y | A | - | N | | | | | | | | | | N | 2 | 0 | 1 |
| 8735999 | 2019 | 4/15/2019 | 100 | 3/2/2019 | 1834 | 207524 | 410 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | HIBERNIA DR | DUBLIN BL | 243 | S | N | C | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8741775 | 2018 | 11/30/2018 | 100 | 11/15/2018 | 826 | 100411 | 0 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | GLEASON DR | FALLON RD | 175 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8753320 | 2018 | 1/28/2019 | 100 | 12/13/2018 | 1528 | 202219 | 322 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | BURTON ST | 10 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8757540 | 2018 | 12/20/2018 | 100 | 11/29/2018 | 1512 | 100411 | 305 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DAVONA DR | DAVONA LN | 446 | E | N | B | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8763057 | 2018 | 12/27/2018 | 100 | 12/11/2018 | 819 | 201242 | 507 | 2 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VALENTANO DR | URBINO ST | 6 | E | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8810265 | 2019 | 3/18/2019 | 100 | 2/20/2019 | 1313 | 201242 | 320 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PKWY | TAMARACK DR | 0 | | Y | B | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8831308 | 2019 | 4/4/2019 | 100 | 3/24/2019 | 1216 | 201242 | 221 | 7 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | VILLAGE PW | 212 | W | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8834345 | 2019 | 4/12/2019 | 100 | 3/27/2019 | 654 | 100411 | 416 | 3 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | NO VAL | DEMARCUS BL | DUBLIN BL | 356 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8870236 | 2019 | 6/5/2019 | 100 | 5/4/2019 | 1813 | 210672 | | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | VILLAGE PKWY | TAMARACK DR | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8888013 | 2019 | 7/16/2019 | 100 | 6/6/2019 | 2155 | 207525 | 0 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | ASTERWOOD DR | REDWOOD AV | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8950388 | 2019 | 11/7/2019 | 100 | 9/23/2019 | 646 | 100411 | 509 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | CENTRAL PKWY | LEE THOMPSON ST | 0 | | Y | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8951142 | 2019 | 11/6/2019 | 100 | 9/21/2019 | 1939 | 207519 | 410 | 6 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | MYRTLE DR | 39 | W | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 8971125 | 2019 | 11/14/2019 | 100 | 10/24/2019 | 723 | 203264 | | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | IRON HORSE PKWY | DUBLIN BL | 329 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 8991040 | 2019 | 1/15/2020 | 100 | 11/21/2019 | 926 | 203264 | 0 | 4 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | GOLDEN GATE DR | ST PATRICK DR | 376 | S | N | A | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 9010818 | 2019 | 2/15/2020 | 100 | 12/13/2019 | 1811 | 209766 | 320 | 5 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | VILLAGE PKWY | 0 | | Y | B | C | N | | | | | | | | | | N | 4 | 0 | 1 |
| 9010822 | 2019 | 2/15/2020 | 100 | 12/8/2019 | 1810 | 202964 | 502 | 7 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | FALLON RD | POSITANO PKWY | 210 | S | N | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 9010826 | 2019 | 2/15/2020 | 100 | 12/2/2019 | 1051 | 211122 | | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | IRON HORSE PKWY | MARTINELLI | 71 | S | N | C | - | N | | | | | | | | | | N | 3 | 0 | 1 |
| 9010867 | 2019 | 2/14/2020 | 100 | 12/9/2019 | 817 | 201242 | 0 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | AMADOR VALLEY BL | STAGECOACH RD | 480 | W | N | E | - | N | | | | | | | | | | N | 4 | 0 | 1 |
| 9028077 | 2019 | 2/5/2020 | 100 | 12/23/2019 | 1900 | 201998 | 0 | 1 | 5 | 4 | 198 | 0 | 0 | 0 | | 0 | | DUBLIN BL | FALLON GATEWAY | 0 | | Y | A | - | N | | | | | | | | | | N | 3 | 0 | 1 |

| CASE_ID | ACCIDENT_YEAR | PROC_DATE | JURIS | COLLISION_DATE | COLLISION_TIME | PARTY_COUNT | PRIMARY_COLL_FACTOR | PCF_CODE_OF_VIOL | PCF_VIOL_CATEGORY | PCF_VIOLATION | PCF_VIOL_SUBSECTION | HIT_AND_RUN | TYPE_OF_COLLISION | MVIW | PED_ACTION | ROAD_SURFACE | ROAD_COND_1 | ROAD_COND_2 | LIGHTING | CONTROL_DEVICE | CHP_ROAD_TYPE | PEDESTRIAN_ACCIDENT | BICYCLE_ACCIDENT | MOTORCYCLE_ACCIDENT | TRUCK_ACCIDENT | NOT_PRIVATE_PROPERTY | ALCOHOL_INVOLVED | STWD_VEHTYPE_AT_FAULT | CHP_VEHTYPE_AT_FAULT | COUNT_SEVERE_INJ | COUNT_VISIBLE_INJ | COUNT_COMPLAINT_PAIN | COUNT_PED_KILLED | COUNT_PED_INJURED | COUNT_BICYCLIST_KILLED | COUNT_BICYCLIST_INJURED | COUNT_MC_KILLED | COUNT_MC_INJURED | PRIMARY_RAMP | SECONDARY_RAMP | LATITUDE | LONGITUDE | COUNTY | CITY | POINT_X | POINT_Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6363339 | 2014 | 6/11/2014 | 100 | 1/30/2014 | 1636 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | D | 0 | Y | | | | Y | | D | 22 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.921 | 37.71352 |
| 6397006 | 2014 | 10/13/2015 | 100 | 1/29/2014 | 833 | 1 | A | - | 10 | 21952 | | M | G | B | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.923 | 37.71467 |
| 6423660 | 2014 | 6/24/2014 | 100 | 3/20/2014 | 1712 | 2 | A | - | 21 | 22106 | | N | G | B | F | A | H | - | A | D | 0 | Y | | | | Y | | D | 22 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | 37.7159 | -121.806 | ALAMEDA | DUBLIN | -121.886 | 37.71591 |
| 6460407 | 2014 | 7/10/2014 | 100 | 4/2/2014 | 1333 | 2 | A | - | 10 | 21952 | | N | G | B | F | A | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.928 | 37.70488 |
| 6475283 | 2014 | 7/24/2014 | 100 | 4/16/2014 | 1535 | 2 | A | - | 12 | 22450 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | - | | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.888 | 37.70993 |
| 6475287 | 2014 | 7/24/2014 | 100 | 4/23/2014 | 1006 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.872 | 37.70579 |
| 6541933 | 2014 | 8/28/2014 | 100 | 7/26/2014 | 1656 | 2 | A | - | 12 | 21453 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.885 | 37.7063 |
| 6606255 | 2014 | 10/7/2014 | 100 | 7/30/2014 | 651 | 2 | A | - | 12 | 21453 | A | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.893 | 37.70623 |
| 6646294 | 2014 | 10/10/2014 | 100 | 9/17/2014 | 954 | 2 | A | - | 11 | 21950 | B | N | G | B | D | A | H | - | A | D | 0 | Y | | | | Y | | N | 60 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.926 | 37.72436 |
| 6646298 | 2014 | 10/10/2014 | 100 | 9/15/2014 | 723 | 2 | A | - | 8 | 22107 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 8 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71979 |
| 6669800 | 2014 | 11/7/2014 | 100 | 9/26/2014 | 1042 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.853 | 37.71639 |
| 6679695 | 2014 | 1/28/2015 | 100 | 9/15/2014 | 758 | 2 | A | - | 10 | 21950 | C | F | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | - | | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71853 |
| 6684186 | 2014 | 12/19/2014 | 100 | 10/16/2014 | 1531 | 1 | B | - | 22 | | | N | E | I | A | A | H | - | A | D | 0 | | Y | | | Y | | - | - | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.869 | 37.71264 |
| 6684190 | 2014 | 12/19/2014 | 100 | 10/17/2014 | 1137 | 2 | A | - | 9 | 21804 | A | N | G | B | F | A | H | - | A | D | 0 | Y | | | | Y | | A | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.934 | 37.70671 |
| 6684194 | 2014 | 12/19/2014 | 100 | 10/4/2014 | 10 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | C | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.893 | 37.70623 |
| 6691789 | 2014 | 11/20/2014 | 100 | 9/11/2014 | 1523 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.92 | 37.71208 |
| 6713339 | 2014 | 1/9/2015 | 100 | 11/7/2014 | 807 | 2 | A | - | 8 | 22107 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.853 | 37.71639 |
| 6718683 | 2017 | 4/8/2019 | 100 | 12/20/2017 | 2040 | 2 | A | - | 11 | 21955 | | N | G | B | E | A | H | - | E | A | 0 | Y | | | | Y | | N | 60 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | - | WF | | | ALAMEDA | DUBLIN | -121.873 | 37.7016 |
| 6748044 | 2014 | 1/26/2015 | 100 | 11/22/2014 | 2109 | 3 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | C | A | 0 | Y | | | | Y | | A | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.934 | 37.70292 |
| 6759034 | 2014 | 1/26/2015 | 100 | 11/26/2014 | 1049 | 1 | A | - | 3 | 22350 | | N | E | I | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.922 | 37.71821 |
| 6776929 | 2014 | 2/12/2015 | 100 | 12/20/2014 | 1101 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | D | 22 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.919 | 37.70517 |
| 6858267 | 2015 | 4/2/2015 | 100 | 2/4/2015 | 1820 | 2 | A | - | 0 | 2818 | | N | G | B | E | A | G | - | C | A | 0 | Y | | | | Y | | A | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.941 | 37.71728 |
| 6877336 | 2015 | 4/15/2015 | 100 | 3/25/2015 | 1451 | 2 | A | - | 9 | 21804 | A | N | G | B | F | A | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.72033 |
| 6892456 | 2015 | 4/30/2015 | 100 | 3/13/2015 | 1647 | 2 | A | - | 6 | 21750 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.869 | 37.70884 |
| 6892458 | 2015 | 4/30/2015 | 100 | 3/23/2015 | 1214 | 2 | A | - | 5 | 21202 | A | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71485 |
| 6895862 | 2015 | 5/22/2015 | 100 | 3/20/2015 | 844 | 3 | D | - | 0 | | | N | G | B | F | A | H | - | A | D | 0 | Y | | | | Y | | - | - | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.923 | 37.71466 |
| 6896523 | 2015 | 5/15/2015 | 100 | 4/6/2015 | 648 | 2 | A | - | 8 | 22107 | | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 7 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.885 | 37.7063 |
| 6896535 | 2015 | 5/15/2015 | 100 | 4/23/2015 | 1202 | 2 | A | - | 5 | 21650 | 1 | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.91 | 37.70654 |
| 6926041 | 2015 | 6/1/2015 | 100 | 5/7/2015 | 1123 | 2 | A | - | 12 | 21453 | A | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.869 | 37.70978 |
| 6978936 | 2015 | 7/7/2015 | 100 | 6/5/2015 | 1141 | 2 | A | - | 9 | 21453 | B | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.936 | 37.70206 |
| 7002092 | 2015 | 7/22/2015 | 100 | 6/29/2015 | 850 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.865 | 37.71994 |
| 7038764 | 2015 | 9/3/2015 | 100 | 8/5/2015 | 1654 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.935 | 37.7061 |
| 7045238 | 2015 | 9/9/2015 | 100 | 8/15/2015 | 1304 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.935 | 37.70607 |
| 7047085 | 2015 | 9/19/2015 | 100 | 8/31/2015 | 1559 | 3 | A | - | 9 | 21804 | A | M | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71852 |
| 7057301 | 2015 | 11/13/2015 | 100 | 9/9/2015 | 757 | 2 | A | - | 17 | 21451 | A | N | D | G | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 8 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.864 | 37.71365 |
| 7064786 | 2015 | 9/22/2015 | 100 | 9/1/2015 | 1107 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.70511 |
| 7066429 | 2015 | 9/23/2015 | 100 | 8/21/2015 | 1912 | 2 | A | - | 21 | 22106 | A | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.872 | 37.70981 |
| 7123085 | 2015 | 12/2/2015 | 100 | 9/23/2015 | 825 | 2 | A | - | 9 | 21804 | A | N | G | B | F | A | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.70964 |
| 7132019 | 2015 | 12/9/2015 | 100 | 11/22/2015 | 1546 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71489 |
| 7148992 | 2015 | 2/3/2016 | 100 | 12/14/2015 | 1510 | 2 | A | - | 9 | 21804 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | | |
| 7187881 | 2016 | 2/22/2016 | 100 | 1/27/2016 | 828 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.867 | 37.71489 |
| 7199634 | 2016 | 9/25/2018 | 100 | 4/25/2016 | 2259 | 3 | A | - | 0 | 21456 | 1 | N | G | B | B | A | H | - | C | A | 0 | Y | | | | Y | | N | 60 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.893 | 37.70623 |
| 7207981 | 2016 | 3/21/2016 | 100 | 2/17/2016 | 751 | 2 | A | - | 10 | 21952 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.72035 |
| 8000919 | 2016 | 3/30/2016 | 100 | 2/27/2016 | 1112 | 2 | A | - | 8 | 21717 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 8 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.93 | 37.70927 |
| 8026971 | 2016 | 4/27/2016 | 100 | 4/19/2016 | 1331 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.92 | 37.70537 |
| 8038919 | 2016 | 5/16/2016 | 100 | 4/9/2016 | 1507 | 2 | A | - | 17 | 21451 | A | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.893 | 37.70623 |
| 8040489 | 2016 | 5/19/2016 | 100 | 4/18/2016 | 1754 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.924 | 37.70644 |
| 8057436 | 2016 | 6/13/2016 | 100 | 5/27/2016 | 806 | 2 | A | - | 9 | 21801 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.919 | 37.70504 |
| 8082082 | 2016 | 7/15/2016 | 100 | 6/29/2016 | 2051 | 2 | A | - | 8 | 22107 | | F | E | I | F | A | H | - | D | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.936 | 37.71334 |
| 8089931 | 2016 | 10/20/2016 | 100 | 8/25/2016 | 2055 | 2 | A | - | 9 | 21453 | B | N | H | G | A | A | H | - | C | A | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.888 | 37.70866 |
| 8091427 | 2016 | 7/29/2016 | 100 | 7/13/2016 | 1010 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.934 | 37.7029 |
| 8092200 | 2016 | 8/3/2016 | 100 | 6/26/2016 | 948 | 2 | A | - | 0 | 23250 | | N | H | - | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.941 | 37.71728 |
| 8097043 | 2016 | 8/12/2016 | 100 | 7/1/2016 | 2331 | 2 | A | - | 0 | 21456 | 1 | N | G | B | B | A | H | - | C | A | 0 | Y | | | | Y | | N | 60 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.893 | 37.70623 |
| 8113234 | 2016 | 9/7/2016 | 100 | 8/13/2016 | 852 | 3 | A | - | 3 | 22350 | | N | C | C | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.934 | 37.70763 |
| 8148040 | 2016 | 10/18/2016 | 100 | 9/21/2016 | 1407 | 2 | D | - | 0 | | | N | G | B | B | A | H | - | A | D | 0 | Y | | | | Y | | - | - | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | | |
| 8165468 | 2016 | 11/14/2016 | 100 | 11/6/2016 | 1700 | 2 | A | - | 10 | 21950 | A | F | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.872 | 37.70575 |
| 8191866 | 2016 | 12/21/2016 | 100 | 11/14/2016 | 1754 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | B | A | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.851 | 37.70677 |
| 8205673 | 2016 | 1/13/2017 | 100 | 12/18/2016 | 1856 | 2 | A | - | 7 | 21658 | A | N | H | G | A | A | H | - | D | D | 0 | | Y | | | Y | Y | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.926 | 37.71048 |
| 8316684 | 2017 | 3/6/2017 | 100 | 2/17/2017 | 1549 | 2 | A | - | 21 | 22106 | | N | G | B | E | B | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.941 | 37.70442 |
| 8358065 | 2017 | 5/2/2017 | 100 | 4/14/2017 | 724 | 2 | A | - | 8 | 22107 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.919 | 37.71333 |
| 8363793 | 2017 | 5/18/2017 | 100 | 4/29/2017 | 1058 | 2 | A | - | 8 | 22107 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.914 | 37.70381 |
| 8363809 | 2017 | 5/18/2017 | 100 | 4/27/2017 | 731 | 2 | A | - | 5 | 21650 | 1 | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.916 | 37.71677 |
| 8386199 | 2017 | 7/11/2017 | 100 | 5/31/2017 | 1900 | 2 | D | - | 0 | | | N | H | G | A | A | H | - | B | A | 0 | | Y | | | Y | | - | - | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | | |
| 8391055 | 2017 | 6/28/2017 | 100 | 5/30/2017 | 1620 | 2 | A | - | 9 | 21453 | C | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.72194 |
| 8391063 | 2017 | 6/28/2017 | 100 | 5/19/2017 | 852 | 2 | A | - | 3 | 22350 | | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71907 |
| 8399630 | 2017 | 7/31/2017 | 100 | 6/14/2017 | 1004 | 2 | A | - | 5 | 21650 | 1 | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.874 | 37.70574 |
| 8400056 | 2017 | 8/15/2017 | 100 | 6/13/2017 | 906 | 2 | A | - | 6 | 21951 | | F | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.888 | 37.70617 |
| 8402990 | 2017 | 7/12/2017 | 100 | 6/22/2017 | 911 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | D | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.918 | 37.70484 |
| 8403328 | 2017 | 7/12/2017 | 100 | 6/28/2017 | 1213 | 3 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.902 | 37.70576 |
| 8429817 | 2017 | 8/24/2017 | 100 | 7/11/2017 | 1817 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.92 | 37.70537 |
| 8436902 | 2017 | 9/21/2017 | 100 | 9/2/2017 | 1839 | 2 | A | - | 11 | 21950 | B | N | G | B | B | A | H | - | B | A | 0 | Y | | | | Y | | N | 60 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71021 |
| 8457978 | 2017 | 10/9/2017 | 100 | 9/12/2017 | 803 | 3 | A | - | 3 | 22350 | | N | G | B | B | A | H | - | A | D | 0 | Y | | | | Y | | D | 22 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.883 | 37.70865 |
| 8466761 | 2017 | 10/13/2017 | 100 | 8/30/2017 | 1858 | 3 | A | - | 3 | 22350 | | N | G | B | D | A | H | - | B | D | 0 | Y | | | | Y | | A | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.947 | 37.70687 |
| 8469845 | 2017 | 11/9/2017 | 100 | 8/19/2017 | 1619 | 2 | A | - | 9 | 21804 | A | N | G | B | D | A | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | | |
| 8477284 | 2017 | 10/24/2017 | 100 | 10/5/2017 | 830 | 2 | A | - | 3 | 22350 | | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 7 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.883 | 37.71085 |
| 8489136 | 2017 | 12/4/2017 | 100 | 10/18/2017 | 932 | 2 | A | - | 11 | 21950 | B | N | G | B | C | A | H | - | A | D | 0 | Y | | | | Y | | N | 60 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.883 | 37.70865 |
| 8494507 | 2017 | 11/27/2017 | 100 | 9/28/2017 | 1758 | 2 | A | - | 3 | 22350 | | N | G | B | B | A | H | - | B | D | 0 | Y | | | | Y | | A | 8 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.864 | 37.71789 |
| 8508852 | 2017 | 12/12/2017 | 100 | 11/21/2017 | 1340 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.929 | 37.70425 |
| 8512807 | 2017 | 1/29/2018 | 100 | 12/6/2017 | 1531 | 2 | A | - | 5 | 21202 | A | N | H | G | A | A | H | - | B | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71033 |
| 8538927 | 2017 | 1/30/2018 | 100 | 12/4/2017 | 1550 | 2 | A | - | 21 | 22106 | | N | G | B | F | A | H | - | A | D | 0 | Y | | | | Y | | A | 7 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.924 | 37.7184 |
| 8539371 | 2018 | 2/1/2018 | 100 | 1/5/2018 | 611 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | C | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.853 | 37.71642 |
| 8540665 | 2017 | 1/27/2018 | 100 | 12/21/2017 | 958 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | Y | A | 7 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.918 | 37.70492 |
| 8542669 | 2018 | 2/5/2018 | 100 | 1/12/2018 | 1656 | 3 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.875 | 37.70574 |
| 8560839 | 2018 | 3/13/2018 | 100 | 2/10/2018 | 1247 | 1 | C | - | 18 | | | N | F | A | A | A | B | - | A | D | 0 | | Y | | | Y | | - | - | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.851 | 37.70528 |
| 8584261 | 2018 | 3/29/2018 | 100 | 2/19/2018 | 744 | 2 | A | - | 9 | 21804 | A | N | H | G | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.935 | 37.70608 |
| 8584284 | 2018 | 4/5/2018 | 100 | 3/5/2018 | 818 | 2 | A | - | - | | | N | G | B | B | A | H | - | A | D | 0 | Y | | | | Y | | A | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.857 | 37.71305 |
| 8613829 | 2018 | 4/24/2018 | 100 | 4/3/2018 | 1653 | 1 | B | - | 22 | | | N | E | I | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.931 | 37.70374 |
| 8621657 | 2018 | 5/29/2018 | 100 | 4/25/2018 | 1534 | 2 | A | - | 5 | 21650 | 1 | N | H | G | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.924 | 37.70647 |
| 8625261 | 2018 | 5/30/2018 | 100 | 5/9/2018 | 1435 | 2 | A | - | 12 | 21453 | A | F | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.86 | 37.70851 |
| 8668416 | 2018 | 8/7/2018 | 100 | 7/10/2018 | 1247 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.92 | 37.70537 |
| 8679053 | 2018 | 8/30/2018 | 100 | 7/27/2018 | 1644 | 2 | A | - | 8 | 22107 | | N | B | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.889 | 37.70618 |
| 8690884 | 2018 | 9/25/2018 | 100 | 8/27/2018 | 1714 | 2 | A | - | 11 | 21950 | B | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | N | 60 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.872 | 37.7077 |
| 8719717 | 2018 | 10/23/2018 | 100 | 9/26/2018 | 1519 | 2 | A | - | 9 | 21453 | B | N | D | G | A | A | H | - | A | A | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.941 | 37.71725 |
| 8733346 | 2018 | 12/4/2018 | 100 | 10/31/2018 | 844 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | B | A | 0 | Y | | | | Y | | A | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.912 | 37.70372 |
| 8735999 | 2019 | 4/15/2019 | 100 | 3/2/2019 | 1834 | 2 | A | - | 10 | 21950 | A | N | G | B | B | B | H | - | C | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.885 | 37.70563 |
| 8741775 | 2018 | 11/30/2018 | 100 | 11/15/2018 | 826 | 1 | B | - | 22 | | | N | H | A | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.857 | 37.71582 |
| 8753320 | 2018 | 1/28/2019 | 100 | 12/13/2018 | 1528 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.921 | 37.7135 |
| 8757540 | 2018 | 12/20/2018 | 100 | 11/29/2018 | 1512 | 2 | A | - | 11 | 21954 | A | N | G | B | D | B | H | - | A | D | 0 | Y | | | | Y | | N | 60 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.937 | 37.72307 |
| 8763057 | 2018 | 12/27/2018 | 100 | 12/11/2018 | 819 | 2 | A | - | 12 | 22450 | A | N | D | G | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.848 | 37.72421 |
| 8810265 | 2019 | 3/18/2019 | 100 | 2/20/2019 | 1313 | 2 | A | - | 5 | 21202 | A | N | D | G | A | A | H | - | A | A | 0 | | Y | | | Y | | L | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71489 |
| 8831308 | 2019 | 4/4/2019 | 100 | 3/24/2019 | 1216 | 2 | A | - | 8 | 22107 | | N | D | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.928 | 37.71001 |
| 8834345 | 2019 | 4/12/2019 | 100 | 3/27/2019 | 654 | 2 | A | - | 10 | 21952 | | N | D | J | F | A | H | - | A | D | 0 | Y | | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.9 | 37.70481 |
| 8870236 | 2019 | 6/5/2019 | 100 | 5/4/2019 | 1813 | 3 | A | - | 10 | 21950 | | N | H | G | B | A | H | - | A | A | 0 | Y | Y | | | Y | | A | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.927 | 37.71489 |
| 8888013 | 2019 | 7/16/2019 | 100 | 6/6/2019 | 2155 | 2 | A | - | 10 | 21950 | A | N | D | G | A | A | H | - | C | D | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.883 | 37.7127 |
| 8950388 | 2019 | 11/7/2019 | 100 | 9/23/2019 | 646 | 2 | A | - | 10 | 21950 | A | N | G | B | B | A | H | - | A | A | 0 | Y | | | | Y | | A | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.86 | 37.70851 |
| 8951142 | 2019 | 11/6/2019 | 100 | 9/21/2019 | 1939 | 2 | A | - | 11 | 21955 | | N | G | B | D | A | H | - | C | A | 0 | Y | | | | Y | Y | N | 60 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.882 | 37.70603 |
| 8971125 | 2019 | 11/14/2019 | 100 | 10/24/2019 | 723 | 2 | A | - | 10 | 21950 | A | N | D | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.897 | 37.70541 |
| 8991040 | 2019 | 1/15/2020 | 100 | 11/21/2019 | 926 | 2 | A | - | 5 | 21651 | B | N | D | C | A | A | H | - | A | D | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.928 | 37.70161 |
| 9010818 | 2019 | 2/15/2020 | 100 | 12/13/2019 | 1811 | 2 | A | - | 5 | 21650 | 1 | N | D | G | A | B | H | - | C | A | 0 | | Y | | | Y | | L | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.924 | 37.70603 |
| 9010822 | 2019 | 2/15/2020 | 100 | 12/8/2019 | 1810 | 2 | D | - | 0 | | | F | B | G | A | A | H | - | C | D | 0 | | Y | | | Y | | - | - | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.852 | 37.71346 |
| 9010826 | 2019 | 2/15/2020 | 100 | 12/2/2019 | 1051 | 2 | D | - | 0 | | | F | G | B | B | B | H | - | A | D | 0 | Y | | | | Y | Y | - | - | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.897 | 37.70403 |
| 9010867 | 2019 | 2/14/2020 | 100 | 12/9/2019 | 817 | 2 | A | - | 9 | 21801 | A | N | B | G | A | A | H | - | A | D | 0 | | Y | | | Y | | A | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.917 | 37.71602 |
| 9028077 | 2019 | 2/5/2020 | 100 | 12/23/2019 | 1900 | 2 | A | - | 0 | 20001 | A | N | D | G | A | A | H | - | C | A | 0 | | Y | | | Y | | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | | | ALAMEDA | DUBLIN | -121.851 | 37.70677 |

Attachment C: Descriptive Statistics Tables

## Dublin Bike Collisions -- 2014-2019

| Collisions by Year | | |
|---|---|---|
| **Year** | **Count** | **Percent** |
| 2014 | 17 | 25% |
| 2015 | 12 | 18% |
| 2016 | 11 | 16% |
| 2017 | 11 | 16% |
| 2018 | 8 | 12% |
| 2019 | 9 | 13% |

| Collisions by Day of Week | | |
|---|---|---|
| **Day** | **Count** | **Percent** |
| Monday | 11 | 72% |
| Tuesday | 9 | |
| Wednesday | 17 | |
| Thursday | 12 | |
| Friday | 11 | 28% |
| Saturday | 5 | |
| Sunday | 3 | |

| Collisions by Time of Day | | |
|---|---|---|
| **Time** | **Count** | **Percent** |
| 6AM to 10AM | 21 | 31% |
| 10AM to 4PM | 23 | 34% |
| 4PM to 8PM | 20 | 29% |
| 8PM to 6AM | 4 | 6% |

| Collisions by Severity | | |
|---|---|---|
| **Severity** | **Count** | **Percent** |
| Fatal | 1 | 1% |
| Severe Injury | 2 | 3% |
| Other Visible Injury | 23 | 34% |
| Complaint of Pain | 18 | 26% |
| Property Damage Only | 24 | 35% |

### Collisions by Lighting and Severity

| Lighting | Fatal | Severe Injury | Other Visible Injury | Complaint of Pain | Property Damage Only | Grand Total | **Share of Total** |
|---|---|---|---|---|---|---|---|
| Dark - No Street Lights | | | 1 | | | 1 | **1%** |
| Dark - Street Lights | | | 3 | 3 | 3 | 9 | **13%** |
| Daylight | 1 | 2 | 18 | 14 | 20 | 55 | **81%** |
| Dusk - Dawn | | | 1 | 1 | 1 | 3 | **4%** |
| Grand Total | 1 | 2 | 23 | 18 | 24 | 68 | **100%** |

| Hit and Run Collisions | | |
|---|---|---|
| **Type** | **Count** | **Percent** |
| Felony | 3 | 4% |
| Misdemanor | 0 | |
| Not Hit and Run | 65 | 96% |

### Intersection/Segment and Collision Severity

| Injury Degree | Intersection | Segment | Grand Total |
|---|---|---|---|
| Fatal | 1 | | 1 |
| Severe Injury | 1 | 1 | 2 |
| Other Visible Injury | 16 | 7 | 23 |
| Complaint of Pain | 14 | 4 | 18 |
| Property Damage Only | 20 | 4 | 24 |
| Grand Total | 52 | 16 | 68 |
| **Share of Total** | **76%** | **24%** | **100%** |

### Primary Collision Factor and Collision Severity

| PCF | Fatal | Severe Injury | Other Visible Injury | Complaint of Pain | Property Damage Only | Grand Total | **Share of Total** |
|---|---|---|---|---|---|---|---|
| Auto R/W Violation | 1 | | 8 | 2 | 7 | **18** | **26%** |
| Not Stated | | | 2 | 6 | 3 | **11** | **16%** |
| Improper Turning | | | 4 | 2 | 5 | **11** | **16%** |
| Other Hazardous Movement | | 1 | 2 | 3 | 2 | **8** | **12%** |
| Unknown | | | | 2 | 2 | **4** | **6%** |
| Traffic Signals and Signs | | | | 2 | 2 | **4** | **6%** |
| Ped R/W Violation | | 1 | 2 | | | **3** | **4%** |
| Unsafe Speed | | | 2 | | | **2** | **3%** |
| Unsafe Starting or Backing | | | 1 | 1 | | **2** | **3%** |
| Other | | | | | 2 | **2** | **3%** |
| Unsafe Lane Change | | | 1 | | | **1** | **1%** |
| Brakes | | | 1 | | | **1** | **1%** |
| Improper Passing | | | | | 1 | **1** | **1%** |
| Grand Total | 1 | 2 | 23 | 18 | 24 | **68** | **100%** |

### Age and Severity

| | Fatal | Severe Injury | Other Visible Injury | Complaint of Pain Injury | Property Damage Only | Total | Share among Reported | Dublin Population Share |
|---|---|---|---|---|---|---|---|---|
| Under 5 | 0 | 0 | 0 | 0 | 0 | 0 | **0%** | **8%** |
| 5-14 years old | 0 | 1 | 5 | 3 | 6 | 15 | **29%** | **16%** |
| 15-24 years old | 0 | 0 | 9 | 2 | 2 | 13 | **25%** | **8%** |
| 25-44 years old | 1 | 0 | 6 | 6 | 3 | 16 | **31%** | **35%** |
| 45-64 years old | 0 | 1 | 2 | 3 | 0 | 6 | **12%** | **25%** |
| 65+ years old | 0 | 0 | 1 | 0 | 1 | 2 | **4%** | **9%** |
| Not Reported | 0 | 0 | 0 | 4 | 12 | 16 | | - |
| **Total** | **1** | **2** | **23** | **18** | **24** | **68** | | |

Reported:

### Gender and Severity

| Gender | Fatal | Severe Injury | Other Visible Injury | Complaint of Pain | Property Damage Only | Grand Total | Share among Reported |
|---|---|---|---|---|---|---|---|
| | | | | 2 | 9 | **11** | |
| Female | | 1 | 5 | 1 | 2 | **9** | **17%** |
| Male | 1 | 1 | 18 | 13 | 11 | **44** | **83%** |
| Not Stated | | | | 2 | 2 | **4** | |
| **Grand Total** | **1** | **2** | **23** | **18** | **24** | **68** | |

## Dublin Pedestrian Collisions -- 2014-2019

### Crashes by Year

| Year | Count | Percent |
|---|---|---|
| 2014 | 12 | 15% |
| 2015 | 13 | 16% |
| 2016 | 10 | 12% |
| 2017 | 13 | 16% |
| 2018 | 18 | 22% |
| 2019 | 15 | 19% |

### Collisions by Day of Week

| Day | Count | Percent |
|---|---|---|
| Monday | 13 | |
| Tuesday | 7 | 58% |
| Wednesday | 20 | |
| Thursday | 6 | |
| Friday | 13 | |
| Saturday | 12 | 43% |
| Sunday | 9 | |

### Collisions by Time of Day

| Time | Count | Percent |
|---|---|---|
| 6AM to 10AM | 16 | 20% |
| 10AM to 4PM | 38 | 47% |
| 4PM to 8PM | 20 | 25% |
| 8PM to 6AM | 7 | 9% |

### Collisions by Severity

| Severity | Count | Percent |
|---|---|---|
| Fatal | 3 | 4% |
| Severe Injury | 9 | 11% |
| Other Visible Injury | 31 | 38% |
| Complaint of Pain | 20 | 25% |
| Property Damage Only | 18 | 22% |

### Collisions by Lighting and Severity

| Lighting | Fatal | Severe Injury | Other Visible Injury | Complaint of Pain | Property Damage Only | Grand Total | Share of Total |
|---|---|---|---|---|---|---|---|
| Dark - Street Lights | 1 | 2 | 5 | 2 | 1 | 11 | **14%** |
| Dark - Street Lights Not Functioning | | 1 | | | | 1 | **1%** |
| Daylight | 1 | 4 | 26 | 16 | 15 | 62 | **77%** |
| Dusk - Dawn | | 2 | | 2 | 2 | 6 | **7%** |
| (blank) | 1 | | | | | 1 | **1%** |
| Grand Total | 3 | 9 | 31 | 20 | 18 | 81 | **100%** |

### Collisions by Intersection/Segment and Severity

| Injury Degree | Intersection | Segment | Grand Total |
|---|---|---|---|
| Fatal | 3 | | 3 |
| Severe Injury | 8 | 1 | 9 |
| Other Visible Injury | 30 | 1 | 31 |
| Complaint of Pain | 17 | 3 | 20 |
| Property Damage Only | 16 | 2 | 18 |
| Grand Total | 74 | 7 | 81 |
| **Share of Total** | **91%** | **9%** | **100%** |

### Collisions by Primary Collision Factor and Severity

| PCF | Fatal | Severe Injury | Other Visible Injury | Complaint of Pain | Property Damage Only | Grand Total | Share of Total |
|---|---|---|---|---|---|---|---|
| Ped R/W Violation | | 2 | 13 | 2 | 5 | 22 | **27%** |
| Other Improper Driving | 1 | 1 | 6 | 2 | 6 | 16 | **20%** |
| Unknown | | 1 | 4 | 4 | 2 | 11 | **14%** |
| Auto R/W Violation | | 3 | 4 | 4 | | 11 | **14%** |
| Pedestrian Violation | | | | 4 | 1 | 5 | **6%** |
| Not Stated | 1 | 1 | 1 | 1 | | 4 | **5%** |
| Unsafe Speed | | 1 | 1 | 1 | | 3 | **4%** |
| Unsafe Starting or Backing | | | | | 3 | 3 | **4%** |
| Other Hazardous Movement | | | | 1 | 1 | 2 | **2%** |
| Traffic Signals and Signs | | | 1 | | | 1 | **1%** |
| Improper Turning | | | | 1 | | 1 | **1%** |
| Improper Passing | | | 1 | | | 1 | **1%** |
| Pedestrian Violatoin | 1 | | | | | 1 | **1%** |
| Grand Total | 3 | 9 | 31 | 20 | 18 | 81 | **100%** |

### Collisions by Age and Severity

| | Fatal | Severe Injury | Other Visible Injury | Complaint of Pain | Property Damage Only | Grand Total | Share among reported | Dublin Population Share |
|---|---|---|---|---|---|---|---|---|
| Under 5 | 0 | 1 | 2 | 3 | 4 | **10** | **18%** | **8%** |
| 5-14 years old | 0 | 1 | 5 | 3 | 0 | **9** | **16%** | **16%** |
| 15-24 years old | 0 | 1 | 3 | 5 | 1 | **10** | **18%** | **8%** |
| 25-44 years old | 1 | 1 | 6 | 1 | 1 | **10** | **18%** | **35%** |
| 45-64 years old | 1 | 0 | 3 | 1 | 2 | **7** | **12%** | **25%** |
| 65+ years old | 0 | 3 | 4 | 3 | 1 | **11** | **19%** | **9%** |
| Not Reported/other | 1 | 3 | 10 | 7 | 13 | **34** | | |
| **Total** | **3** | **10** | **33** | **23** | **22** | **91** | | |
| | | | | | | | Reported | 63% |

### Collisions by Gender and Severity

| Gender | Fatal | Severe Injury | Other Visible Injury | Complaint of Pain | Property Damage Only | Grand Total | Share among reported |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 10 | 7 | 13 | 33 | |
| F | 1 | 5 | 8 | 3 | 2 | 19 | **40%** |
| M | 1 | 2 | 13 | 10 | 3 | 29 | **60%** |
| Grand Total | 3 | 9 | 31 | 20 | 18 | 81 | |
| | | | | | | | **Reported** 59% |

# APPENDIX B

# EXISTING CONDITIONS: LEVEL OF TRAFFIC STRESS ANALYSIS

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# TECHNICAL MEMORANDUM

**Dublin Bicycle and Pedestrian Master Plan**

Level of Traffic Stress Methodology, Assumptions, and Results

| | | |
|---|---|---|
| Date: | July 15, 2020 | Project #: 24392 |
| To: | Sai Midididdi, TE | |
| From: | Mike Alston, RSP; Amanda Leahy, AICP; Erin Ferguson, PE, RSP; Michael Sahimi, AICP | |

The City of Dublin (City) is updating the 2014 Dublin Bicycle and Pedestrian Master Plan (Plan). The Plan will serve as a comprehensive action plan for the City to provide improved bicycle and pedestrian facilities for its residents, employees, and visitors. As part of the baseline conditions and needs assessment, Kittelson & Associates, Inc. (Kittelson) is analyzing the bicyclist level of traffic stress (LTS) on the City's existing roadway network ("on-street LTS")and on the Class I path network ("path LTS"). This memorandum (memo) details the methodology and assumptions used in the on-street LTS analysis for the existing roadway network and the results of the on-street LTS and path LTS analyses. The path LTS methodology and assumptions are included as Attachment A. The memo is organized into the following sections:

- Background
- Methodology
- Available Data and Assumptions
- Existing Conditions LTS Results
- Map Results
- Attachment A: Class I Path LTS Methodology

## BACKGROUND

The on-street LTS methodology used was developed by the Mineta Transportation Institute (MTI) and documented in the *Low-Stress Bicycling and Network Connectivity* report published in 2012;[1] it was further refined by Dr. Peter Furth of Northeastern University in 2017.[2] The on-street LTS measure is a rating given to a road segment or crossing indicating the traffic stress it imposes on bicyclists. It classifies road segments and intersections as one of four levels of traffic stress:

- LTS 1: Requires little attention to surroundings; suitable for most children

[1] Mekuria, Mazza C., "Low-Stress Bicycling and Network Connectivity" (2012). *All Mineta Transportation Institute Publications*. Book 4. http://scholarworks.sjsu.edu/mti_all/4

[2] The methodology is posted at http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/. This methodology is "Version 2.0," published in June 2017.

- LTS 2: Low traffic stress; suitable for most adults
- LTS 3: Moderate traffic stress for all bicyclists
- LTS 4: High stress; only suitable for experienced bicyclists

The on-street LTS methodology has recently been used by agencies such as Alameda CTC and the City of Oakland to assess bicycling conditions and is a best practice methodology for assessing these conditions in the transportation planning profession.

This memo describes the on-street LTS methodology implemented based on the versions developed in 2012 and updated in 2017.

## METHODOLOGY

The on-street LTS methodology includes criteria for establishing the score along roadway segments as well as at intersections and crossings, since the features of a signalized or unsignalized intersection can also have an impact on bicyclist comfort along a path or roadway. This section outlines the methodologies and criteria for both facilities.

### Roadway Segment LTS Methodology

The on-street LTS methodology for roadway segments provides criteria for the following three bicycle facility types:[3]

- Bike lanes alongside a parking lane
- Bike lanes not alongside a parking lane
- Mixed traffic (i.e., no bike lanes present).

Note that under this methodology, Class III bicycle routes are analyzed under the criteria for mixed traffic. In addition, physically separated Class I and Class IV bikeway segments (including parking-separated bike lanes) are always scored the lowest level of traffic stress between intersections, LTS 1. Under the Furth on-street methodology, Class I and IV bikeways are assumed to have the lowest level of stress since bicyclists are separated from interacting with vehicles. This analysis instead applies path LTS scores based on separate evaluation metrics for Class I paths. (See the next section, Path LTS, for discussion of Class I path LTS within the City.)

The methodology evaluation criteria for each of the three facility types are shown in Table 1 through Table 3. These criteria operate following the "weakest link" principle, where the criterion with the

[3] Bikeways can generally be classified as:
Class I: off-street bicycle-only or multi-use path
Class II: on-street bicycle lanes (can also include painted buffer)
Class III: signed on-street bicycle route
Class IV: physically-separated or protected on-street bike lanes

highest (worst) LTS determines the stress level of the segment. For example, if the bike lane width matches the values associated with LTS 1 but the speed limit indicates LTS 3, the segment would be considered to be LTS 3.

**Table 1: Roadway Segment Criteria for Bike Lanes Alongside a Parking Lane**

| Number of Vehicle Lanes | Bike Lane Reach (Bike plus parking lane width) | Prevailing Speed | | |
|---|---|---|---|---|
| | | ≤ 25 mph | 30 mph | 35 mph |
| 1 lane per direction | 15+ ft | LTS 1 | LTS 2 | LTS 3 |
| | 12-14 ft | LTS 2 | LTS 2 | LTS 3 |
| 2 lanes per direction (2-way) | 15+ ft | LTS 2 | LTS 3 | LTS 3 |
| 2-3 lanes per direction (1-way) | | LTS 2 | LTS 3 | LTS 3 |
| other multilane | | LTS 3 | LTS 3 | LTS 3 |

Notes:
1. Bike lane reach = Bike + Parking Lane Width.
2. If bike lane is frequently blocked, use mixed traffic criteria.
3. Qualifying bike lane must have reach (bike lane width + parking lane width) ≥ 12 ft.
4. Bike lane width includes any marked buffer next to the bike lane.
Source: Peter Furth, Northeastern University, http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/

**Table 2: Road Segment Criteria for Bike Lanes and Shoulders Not Adjacent to a Parking Lane**

| Number of Vehicle Lanes | Bike Lane Width | Prevailing Speed | | | | | |
|---|---|---|---|---|---|---|---|
| | | ≤ 25 mph | 30 mph | 35 mph | 40 mph | 45 mph | 50+ mph |
| 1 thru lane per direction, or no striped centerline | 6+ ft | LTS 1 | LTS 2 | LTS 2 | LTS 3 | LTS3 | LTS 3 |
| | 4 or 5 ft | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 4 |
| 2 thru lanes per direction | 6+ ft | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 |
| | 4 or 5 ft | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 4 |
| 3+ lanes per direction | Any width | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |

Notes:
1. If bike lane / shoulder is frequently blocked, used mixed traffic criteria.
2. Qualifying bike lane / shoulder should extend at least 4 ft from a curb and at least 3.5 ft from a pavement edge or discontinuous gutter pan seam.
3. Bike lane width includes any marked buffer next to the bike lane.
Source: Peter Furth, Northeastern University, http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/

**Table 3: Road Segment Criteria for Level of Traffic Stress in Mixed Traffic**

| Number of Lanes | Effective Average Daily Traffic (ADT) | Prevailing Speed | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | ≤ 20 mph | 25 mph | 30 mph | 35 mph | 40 mph | 45 mph | 50+ mph |
| 2-way street with no striped centerline | 0-750 | LTS 1 | LTS 1 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 |
| | 751-1500 | LTS 1 | LTS 1 | LTS 2 | LTS 3 | LTS 3 | LTS 3 | LTS 4 |
| | 1501-3000 | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| | 3000+ | LTS 2 | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| 1 thru lane per direction (1-way, 1-lane street or 2-way street with centerline) | 0-750 | LTS 1 | LTS 1 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 |
| | 751-1500 | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 | LTS 4 |
| | 1501-3000 | LTS 2 | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| | 3000+ | LTS 3 | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| 2 thru lanes per direction | 0-8000 | LTS 3 | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| | 8001+ | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 | LTS 4 | LTS 4 |
| 3+ thru lanes per direction | Any ADT | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 | LTS 4 | LTS 4 |

Note: Effective ADT = ADT for two-way roads; Effective ADT = 1.5*ADT for one-way roads.
Source: Peter Furth, Northeastern University, http://www.northeastern.edu/peter.furth/criteria-for-level-of-traffic-stress/

## Crossing LTS Methodology

Kittelson conducted LTS intersection crossing analysis for street or path intersections that are located along a link that is scored LTS 3 or 4 (i.e., high-stress facilities), since it is likely that the characteristics of a high-stress segment can affect the bicyclist experience when crossing from a low-stress street. The crossing methodology analyzes intersections and crossings for the following situations:

- Intersection approaches for pocket bike lanes (defined as a bike lane that is to the left of a dedicated right-turn vehicle lane)
- Intersection approaches for mixed traffic in the presence of right-turn lanes
- Intersection crossings for unsignalized crossings without a median refuge
- Intersection crossings for unsignalized crossings with a median refuge

The list above is provided by the Furth methodology and does not describe all circumstances. In Dublin, many Class I facilities cross at signalized intersections. See the next section, Path LTS, for a discussion of this topic.

Under the Furth methodology, the LTS at an approach is graded from LTS 1 through LTS 4 based on the criteria outlined in Table 4 through Table 7.

**Table 4: Level of Traffic Stress Criteria for Pocket Bike Lanes**

| Configuration | Level of Traffic Stress |
|---|---|
| Single right-turn lane up to 150 ft. long, starting abruptly while the bike lane continues straight, and having an intersection angle and curb radius such that turning speed is < 15 mph. | LTS ≥ 2 |
| Single right-turn lane longer than 150 ft. starting abruptly while the bike lane continues straight, and having an intersection angle and curb radius such that vehicle turning speed is < 20 mph. | LTS ≥ 3 |
| Single right-turn lane in which the bike lane shifts to the left, but the intersection angle and curb radius are such that turning speed is < 15 mph. | LTS ≥ 3 |
| Single right-turn lane with any other configuration; dual right-turn lanes; or right-turn lane along with an option (through-right) lane. | LTS ≥ 4 |

Source: Mekuria, Maaza. Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012.

**Table 5: Level of Traffic Stress Criteria for Mixed Traffic in the Presence of a Right-Turn Lane**

| Configuration | Level of Traffic Stress |
|---|---|
| Single right-turn lane with length < 75 ft. and intersection angle and curb radius limit turning speed to 15 mph. | (no effect on LTS) |
| Single right-turn lane with length between 75 and 150 ft., and intersection angle and curb radius limit turning speed to 15 mph. | LTS ≥ 3 |
| Otherwise. | LTS ≥ 4 |

Source: Mekuria, Maaza. Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012.

**Table 6: Level of Traffic Stress Criteria for Unsignalized Crossings Without a Median Refuge**

| Speed Limit of Street Being Crossed | Width of Street Being Crossed | | |
|---|---|---|---|
| | Up to 3 lanes | 4-5 lanes | 6+ lanes |
| Up to 25 mph | LTS 1 | LTS 2 | LTS 4 |
| 30 mph | LTS 1 | LTS 2 | LTS 4 |
| 35 mph | LTS 2 | LTS 3 | LTS 4 |
| 40+ mph | LTS 3 | LTS 4 | LTS 4 |

Source: Mekuria, Maaza. Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012.

**Table 7: Level of Traffic Stress Criteria for Unsignalized Crossings with a Median Refuge at Least Six Feet Wide**

| Speed Limit of Street Being Crossed | Width of Street Being Crossed | | |
|---|---|---|---|
| | Up to 3 lanes | 4-5 lanes | 6+ lanes |
| Up to 25 mph | LTS 1 | LTS 1 | LTS 2 |
| 30 mph | LTS 1 | LTS 2 | LTS 3 |
| 35 mph | LTS 2 | LTS 3 | LTS 4 |
| 40+ mph | LTS 3 | LTS 4 | LTS 4 |

Source: Mekuria, Maaza. Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012.

### Path LTS

The on-street LTS methodology employed does not include a detailed path segment or crossing methodology to account for the various design factors that affect quality of service and user stress on Class I paths like those across the City. Thus, Kittelson created a parallel evaluation of path LTS that accounts for path segments and crossings to accompany the on-street LTS methodology. The intent of the path LTS methodology is to account for the varying qualities of service on paths throughout the City and to be able to carry forward the path analysis into prioritization and plan recommendations alongside the on-street LTS analysis. The details of the path LTS analysis are presented in Attachment A: Class I Path LTS Methodology. The results maps of the path LTS evaluation are included alongside the on-street LTS results in this memo.

## AVAILABLE DATA AND ASSUMPTIONS

Kittelson obtained data from the City and compiled it in a spatial database to conduct the on-street and path LTS analyses. Where GIS data were not available, Kittelson combined field review, Google Earth aerial review, City input, and assumptions to build out necessary inputs. The data used in the analysis are shown in Table 8.

**Table 8: Data Requirements and Assumptions**

| Data Requirement | Data Availability/Assumptions |
|---|---|
| Existing dedicated bicycle facilities (Class I, II, II buffered, and IV) in the City | Digitized the City's existing bicycle facilities. See Figure 1. |
| Presence of parking lanes adjacent to bike lanes | This attribute only applies where Class II facilities exist alongside parking (Table 1). Kittelson conducted field review of Class II locations and mapped the presence or absence of parking. See Figure 2. |
| Number of vehicle lanes | Kittelson used City-provided data, which was reviewed and confirmed. Kittelson reviewed missing locations to obtain complete network coverage. See Figure 3. |

| Data Requirement | Data Availability/Assumptions |
|---|---|
| Speed Limit | Kittelson utilized speed limit data provided by the City in shapefile format. On residential roads without speed limit data or posted speeds, speed limit of 25 mph was applied based on the City's prima facie speed limits.[4] See Figure 4. |
| Bike lane width | Kittelson conducted field reviews to determine bike lane widths where the methodology required them**.** |
| Bike lane buffer width | Kittelson conducted field reviews to determine bike lane buffer widths where the methodology required them. |
| Width of bike lane and adjacent parking lane | Kittelson conducted field reviews to determine parking lane widths adjacent to bike lanes where the methodology required this information. |
| Frequency of bicycle lane blockage | This attribute is a binary variable (i.e., whether the bicycle lane is frequently blocked or not) used to reassign facilities with a bike lane to be evaluated as mixed traffic facilities (see note, Table 2). Kittelson assumed that bike lanes next to driveways for large parking lots (such as retail centers) are frequently blocked and applied the mixed traffic criteria for those segments. |
| Average Daily Traffic | Kittelson used the ADT provided by City in shapefile and/or spreadsheet format. Where ADT was not available, ADT categories were estimated based on downstream volumes, adjacent roadways, or the general land use context around a facility. These generally included facilities that were clearly in the highest ADT category for analysis (8,001 +) |
| Centerline presence | Kittelson assumed collector streets are striped with centerlines and local/neighborhood streets were not. The functional classification designations came from the City's 2013 General Plan Circulation Element and from 2012 functional classification designation forms submitted to Caltrans. Where inconsistencies were present, Kittelson assumed a street to be the higher order designation between the two. |
| Presence of right turn lanes and features (e.g., number of lanes and length, and curb radius) | This attribute is required for intersection crossing analysis. Kittelson applied these manually based on Google Earth review on an as-needed basis. |
| Presence of pocket bike lanes and features (e.g., number of lanes and length, and curb radius) | This attribute is required for intersection crossing analysis. Kittelson applied these manually based on Google Earth review on an as-needed basis. |
| Median presence and width | This attribute is required for intersection crossing analysis. Kittelson applied these manually based on Google Earth review on an as-needed basis. |

[4] https://dublin.ca.gov/2094/Speed-Surveys

# EXISTING CONDITIONS LTS RESULTS

## On-Street LTS

The available GIS data, field reviews, Google Earth review, and other assumptions documented above were applied using the methodologies outlined in this memo. The results of the on-street LTS analysis are shown in Figure 7.

- On-street LTS scores were first calculated for bidirectional segments utilizing the segment criteria outlined in Table 1 through Table 3 (with off-street paths receiving a score of LTS 1).
- For locations where low-stress facilities crossed high-stress facilities, the crossing LTS methodologies were applied as outlined in Table 4 through Table 7. For signalized intersections, locations with dedicated right turn lanes and/or pocket bike lanes were reviewed and the approach's LTS score was updated if intersection conditions would result in an increased level of stress. Likewise, for unsignalized intersections, LTS scores were updated as needed.

As shown in Figure 7, low-stress on-street facilities in the City generally consist of local residential roads without dedicated bicycle facilities. Arterial roads, such as Dublin Boulevard generally consist of higher-stress segments for bicyclists, due to features such as vehicular speeds, traffic volumes, and the number of travel lanes, regardless of the inclusion of bike lanes. In addition, low-stress roads are assessed as higher stress (i.e., downgraded to LTS 3 or 4) where they cross high stress facilities, meaning that some low-stress areas are "islands" isolated by high-stress segments and crossings. Figure 8 presents the City's network of low-stress facilities, which helps to highlight where gaps exist. For example, Fallon Road, Tassajara Road, San Ramon Road, and Dublin Boulevard create low-stress gaps in the on-street network.

## Path LTS

As shown in Figure 12, Class IA multi-use paths most frequently score a path LTS of 2 given their width, shoulder, and wayfinding presence. Class IB sidepaths frequently score a path LTS of 3 given no wayfinding present along their segments. The path crossings vary but rarely exceed LTS 3 except at intersection crossings with high speeds, no horizontal/vertical elements, and no crossing markings or signage. Although path LTS values were assessed for every path crossing location, only the crossings with lower scores than the connecting path segments are shown in the mapped results. In other words, the only mapped crossings are those which degrade the segment path LTS score.

## Combined Results

The on-street and path LTS results are presented together in Figure 13 to provide a full picture of connectivity citywide. Note that the directionality of the on-street LTS has been suppressed in order to simplify the level of detail shown; each on-street segment is displaying its highest (i.e., worst) LTS value in Figure 13 rather than directional LTS values.

## NEXT STEPS

After City review and associated revisions to the results, these on-street and path LTS results will be carried forward to inform subsequent Task 3 latent demand analysis and Task 4 network prioritization processes.

## MAP RESULTS

### On-Street LTS Maps

Figure 1a: Existing Dedicated Bicycle Facilities (On-Street)

Figure 1b: Existing Dedicated Bicycle Facilities (Off-Street)

Figure 1c: Existing Dedicated Bicycle Facilities (Combined)

Figure 2: Presence of Parking Adjacent to Bike Lanes

Figure 3: Number of Vehicle Lanes

Figure 4: Speed Limits

Figure 5: Average Daily Traffic (ADT)

Figure 6: Roadway Functional Classifications

Figure 7: Level of Traffic Stress

Figure 8: Level of Traffic Stress (Low-Stress Facilities)

### Class I Path LTS Maps

Figure 9: Existing Path Widths

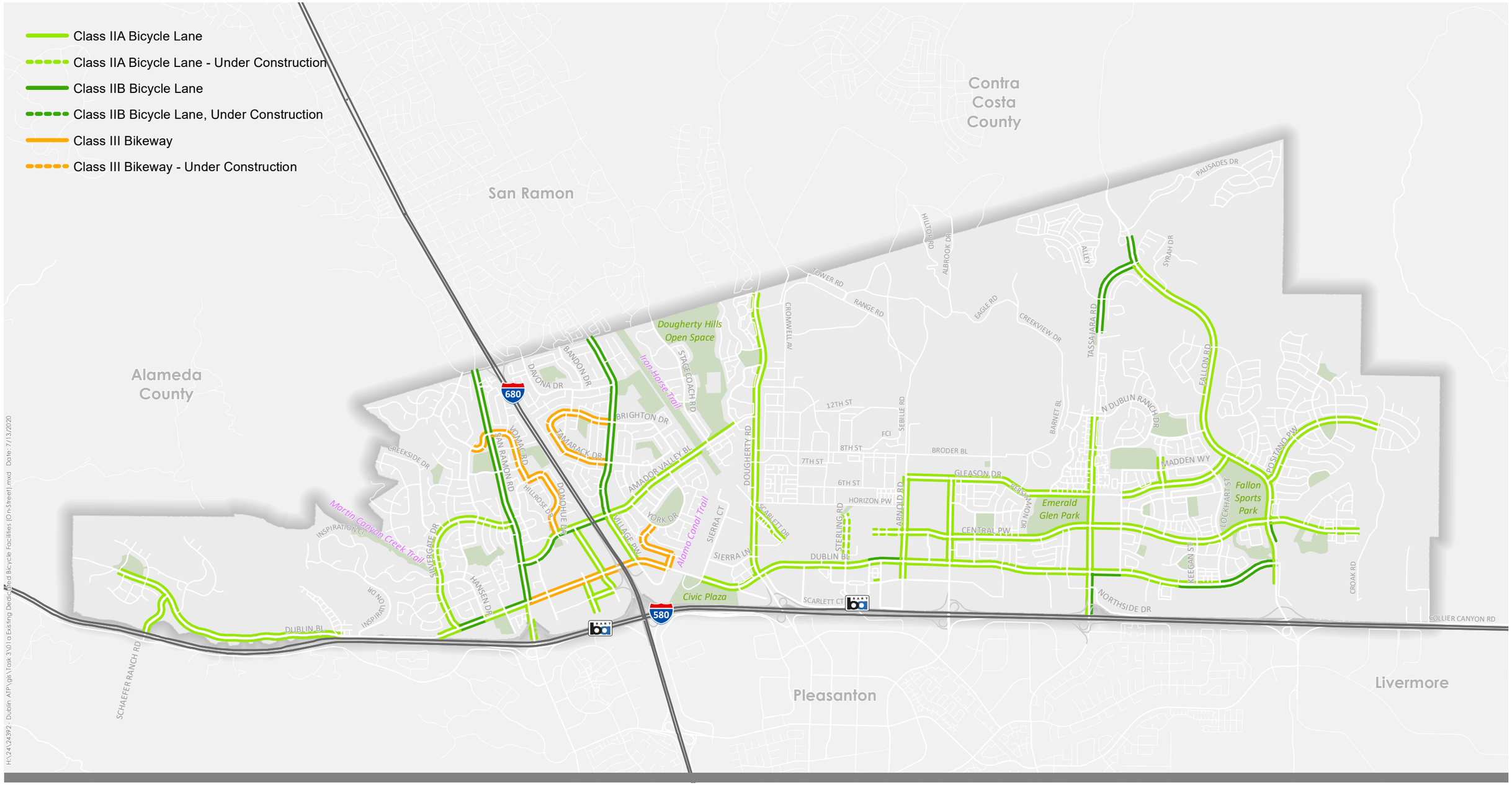
Figure 10: Existing Shoulder and Roadway Separation/Buffer

Figure 11: Existing Path Wayfinding

Figure 12: Path LTS (Segment and Intersection)

### Combined

Figure 13: On-Street and Path LTS



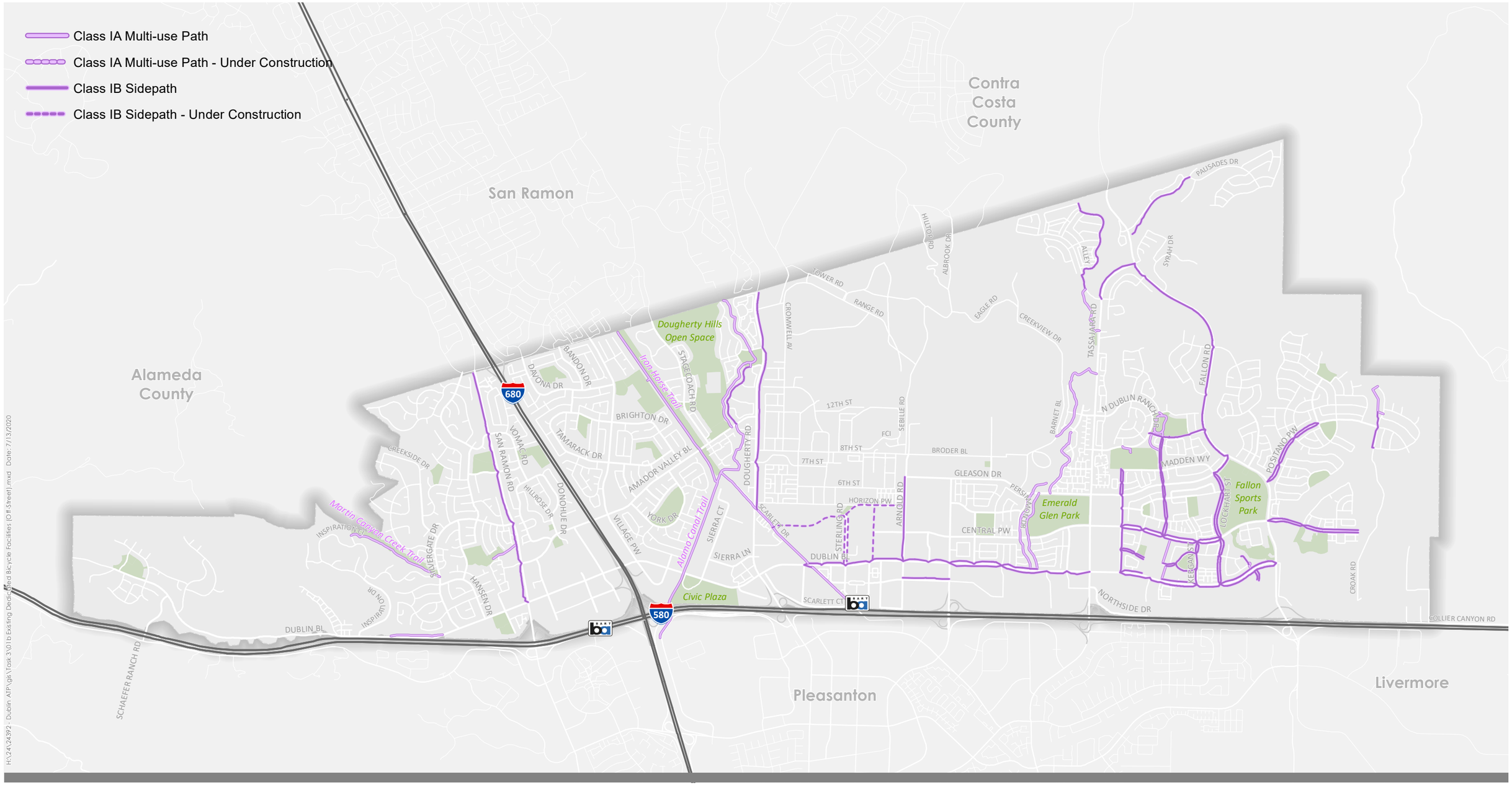

H:\24\24392 - Dublin ATP\gis\Task 3\01 Existing Dedicated Bicycle Facilities (On-Street).mxd Date: 7/13/2020

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Figure 1a

**Existing Dedicated Bicycle Facilities (On-Street)**
**Dublin, California**



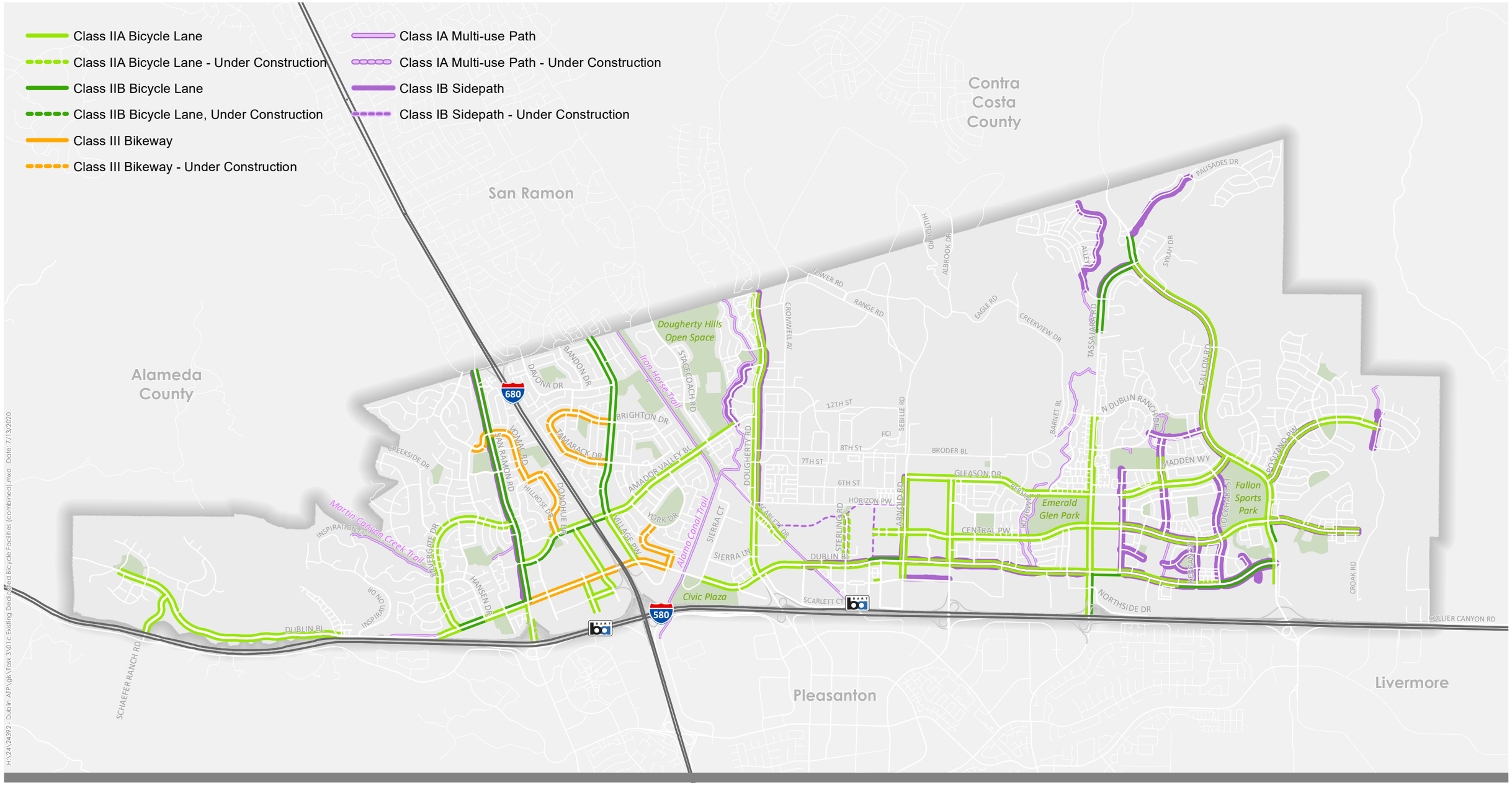

H:\24\24392 - Dublin ATP\gis\Task 3\01b Existing Dedicated Bicycle Facilities (Off-Street).mxd Date: 7/13/2020

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Figure 1b

**Existing Dedicated Bicycle Facilities (Off-Street)**
**Dublin, California**



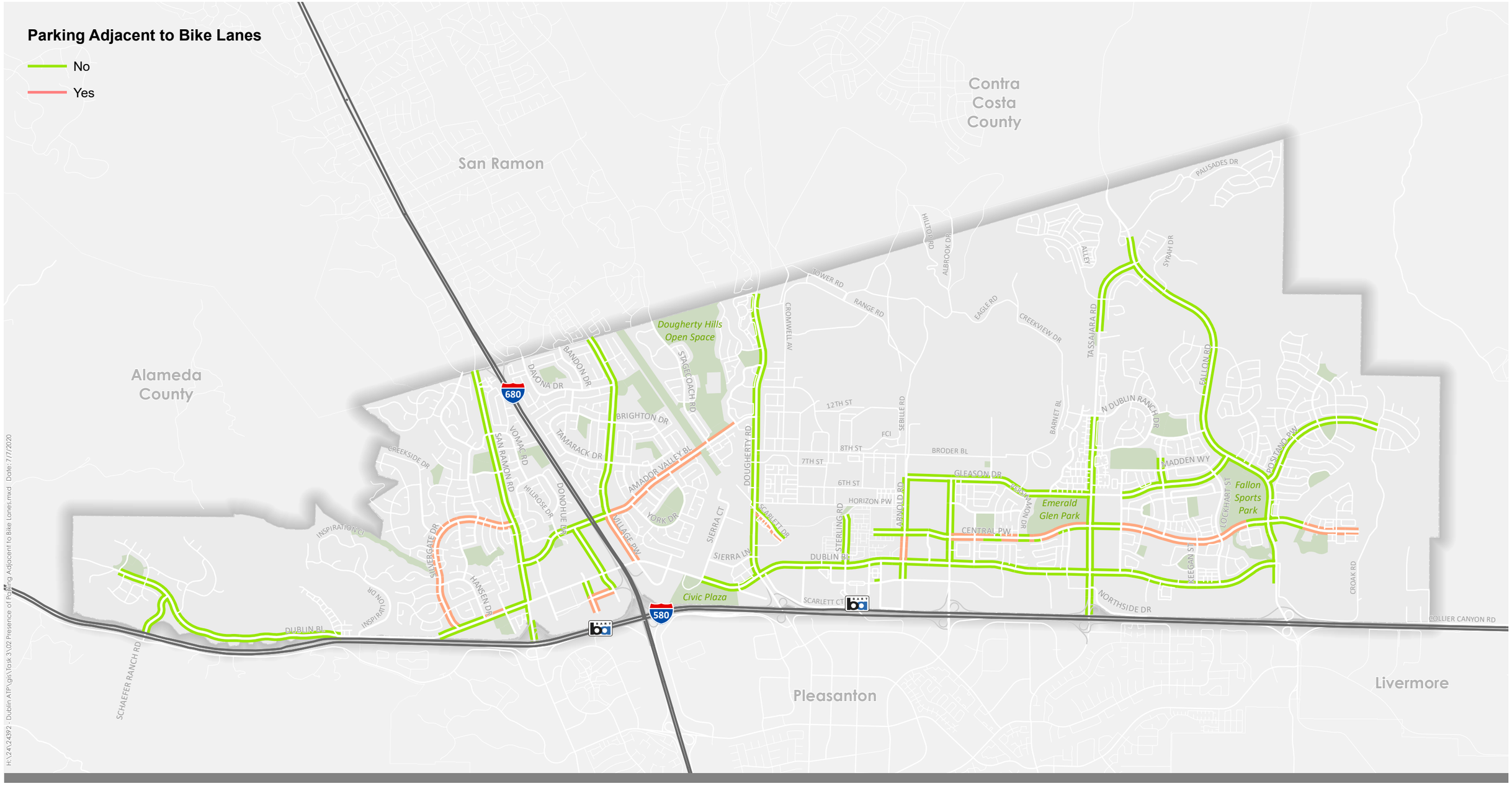

H:\24\24392 - Dublin ATP\gis\Task 3\01c Existing Dedicated Bicycle Facilities (combined).mxd Date: 7/13/2020

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CALIFORNIA

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Figure 1c

**Existing Dedicated Bicycle Facilities (Combined)**
**Dublin, California**



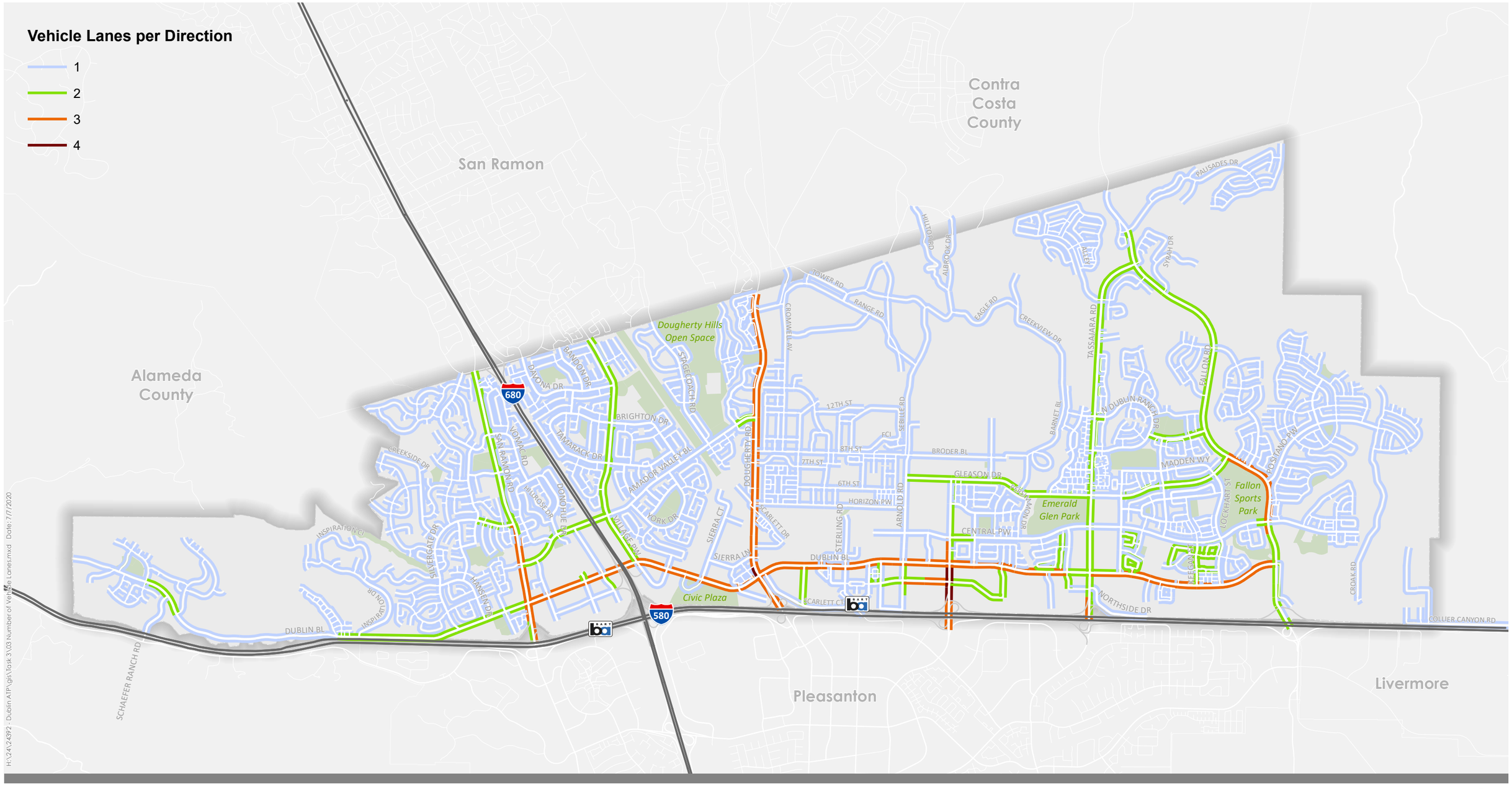

H:\24\24392 - Dublin ATP\gis\Task 3\02 Presence of Parking Adjacent to Bike Lanes.mxd Date: 7/7/2020

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Figure 2

**Presence of Parking Adjacent to Bike Lanes**
**Dublin, California**




H:\24\24392 - Dublin ATP\gis\Task 3.03 Number of Vehicle Lanes.mxd Date: 7/7/2020

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Figure 3

**Number of Vehicle Lanes**
**Dublin, California**



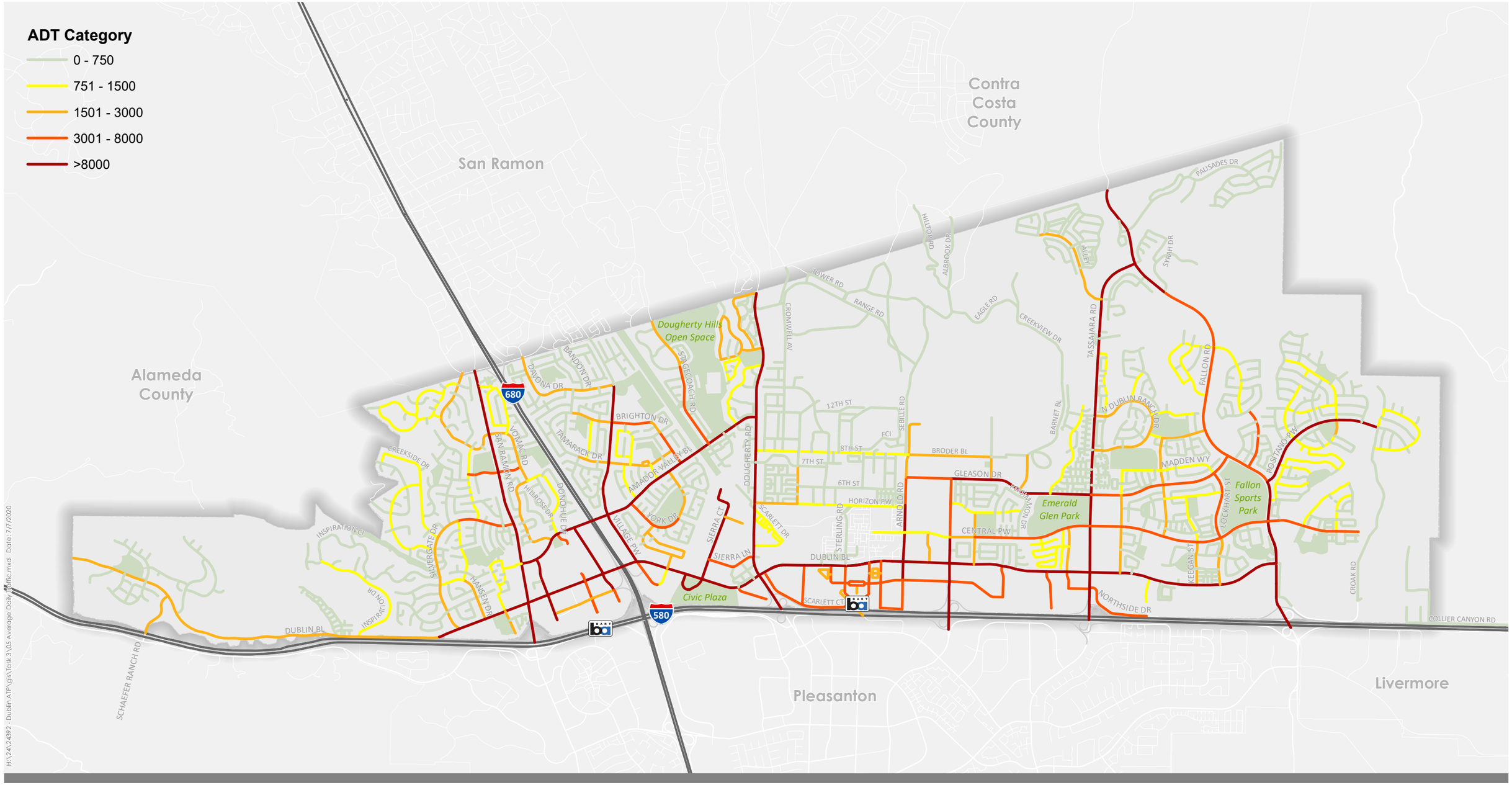

0 1 Mile

Figure 4

**Speed Limits**
**Dublin, California**

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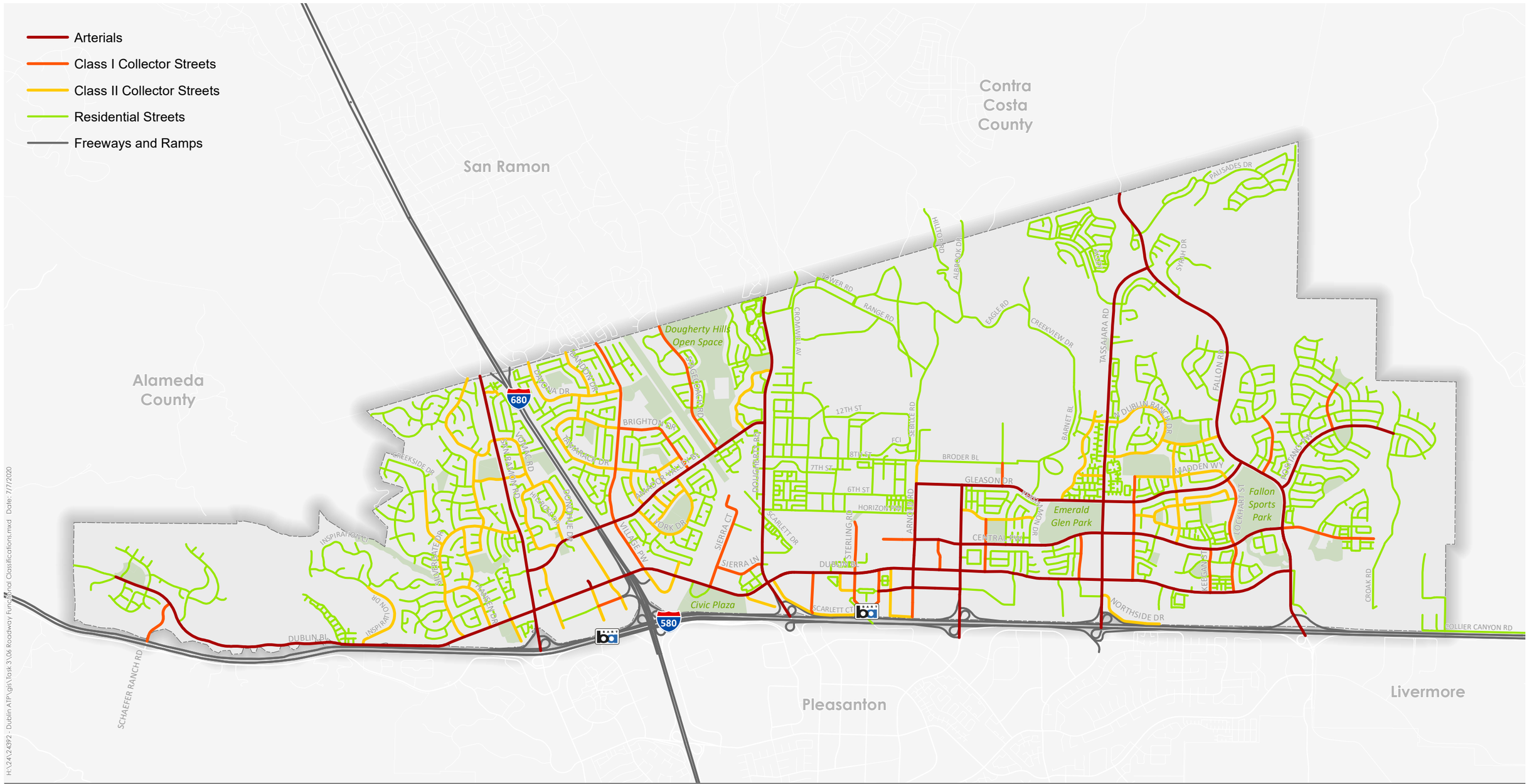

H:\2A\24392 - Dublin ATP\gis\Task 3\05 Average Daily Traffic.mxd Date: 7/7/2020

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Figure 5

**Average Daily Traffic (ADT)**
**Dublin, California**



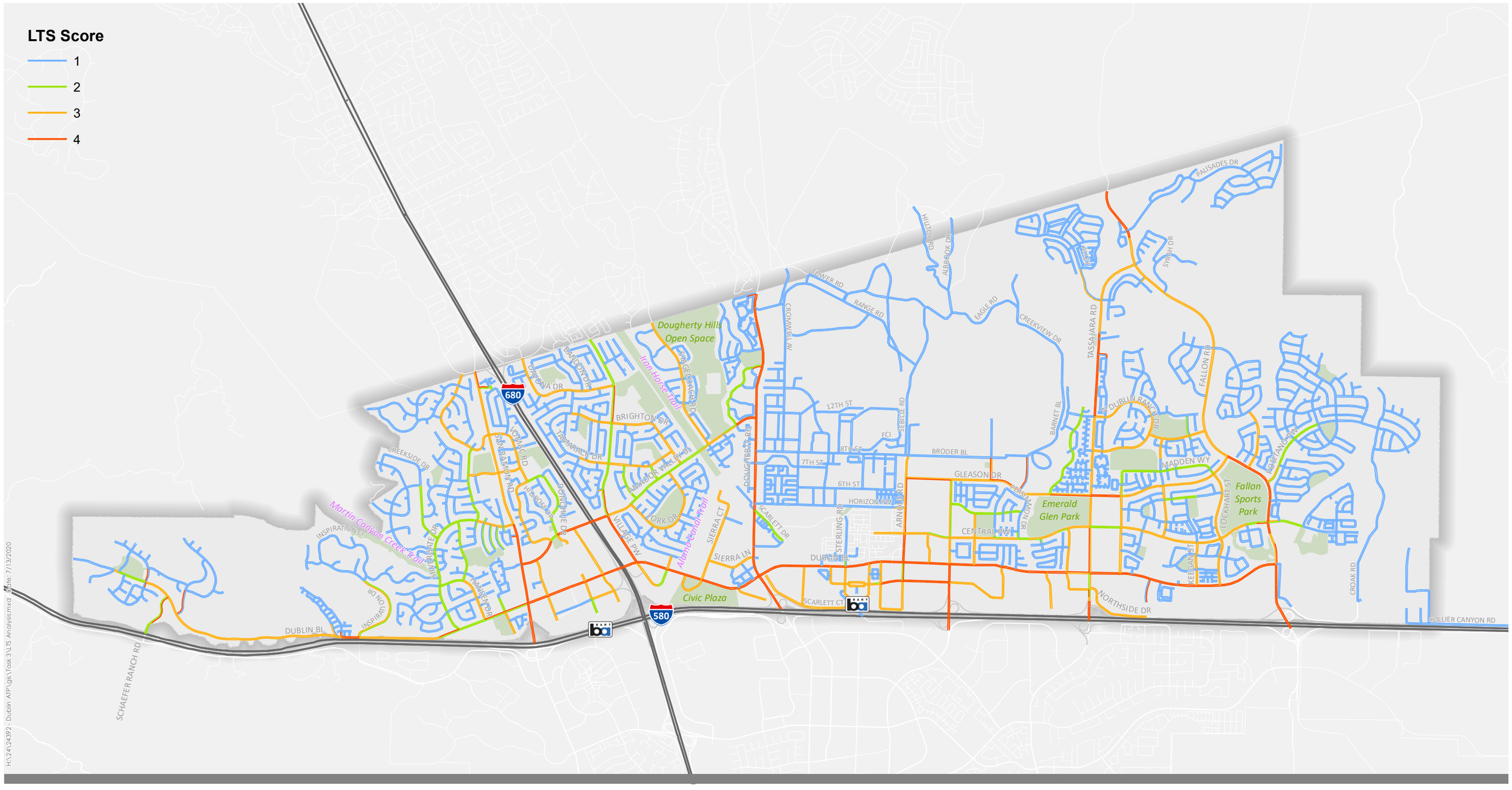

H:\24\24392 - Dublin ATP\gis\Task 3\06 Roadway Functional Classifications.mxd Date: 7/7/2020

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Figure 6

**Roadway Functional Classifications**
**Dublin, California**



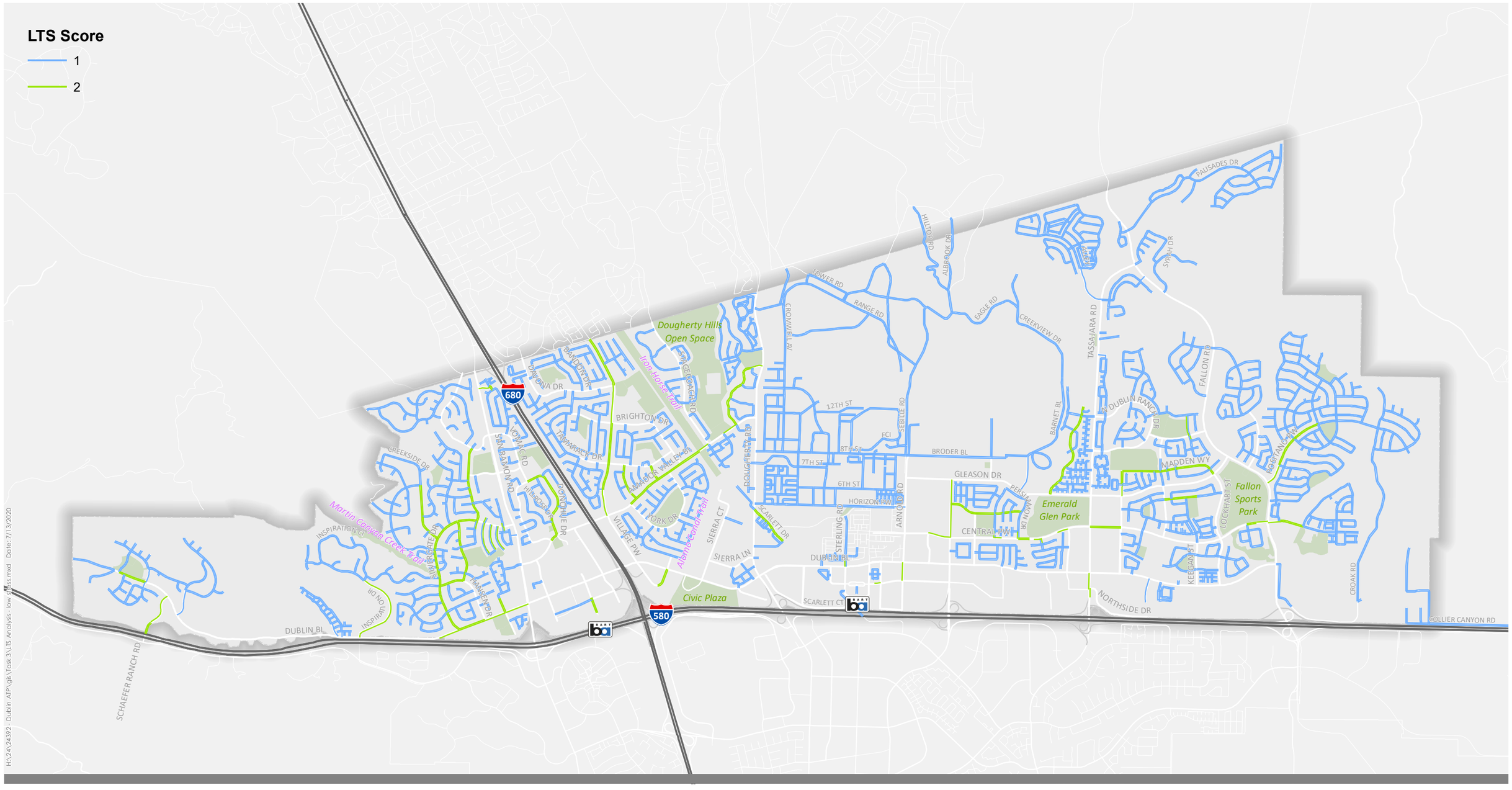

0 1 Mile

Figure 7

**Level of Traffic Stress**
**Dublin, California**

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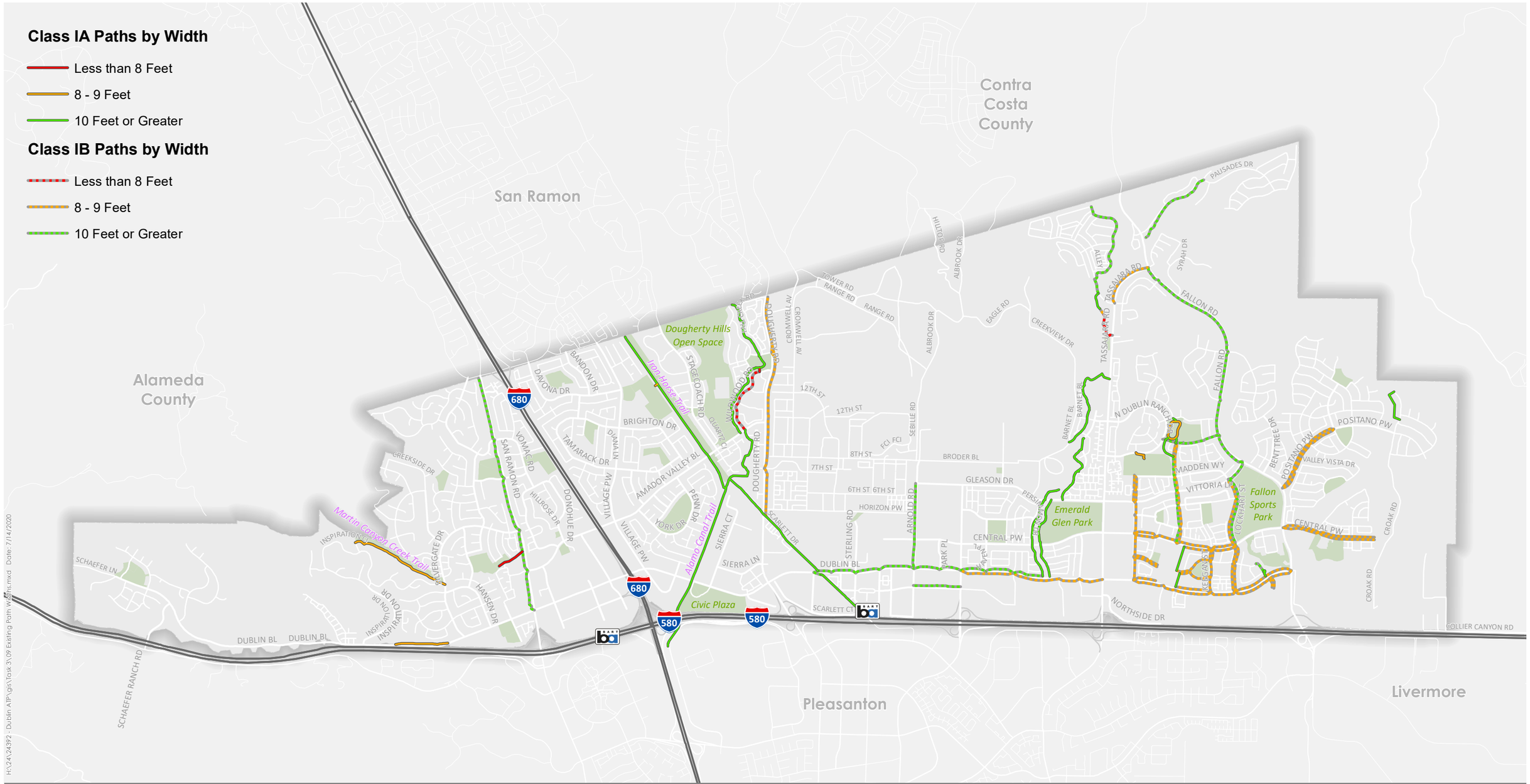

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Figure 8

**Level of Traffic Stress - Low Stress Facilities**
**Dublin, California**




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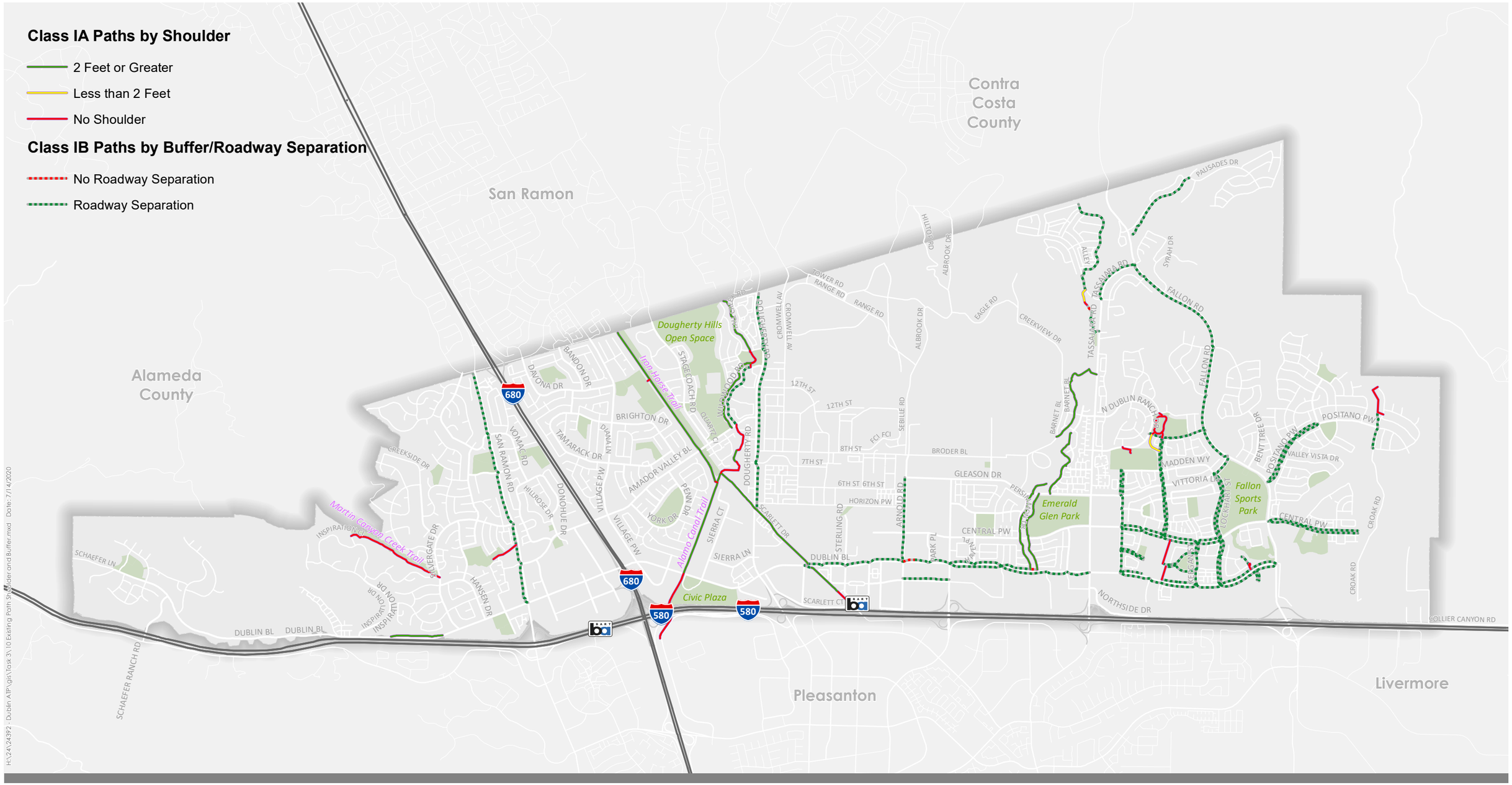
DUBLIN CALIFORNIA

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Figure 9

**Existing Path Widths**
**Dublin, California**

680



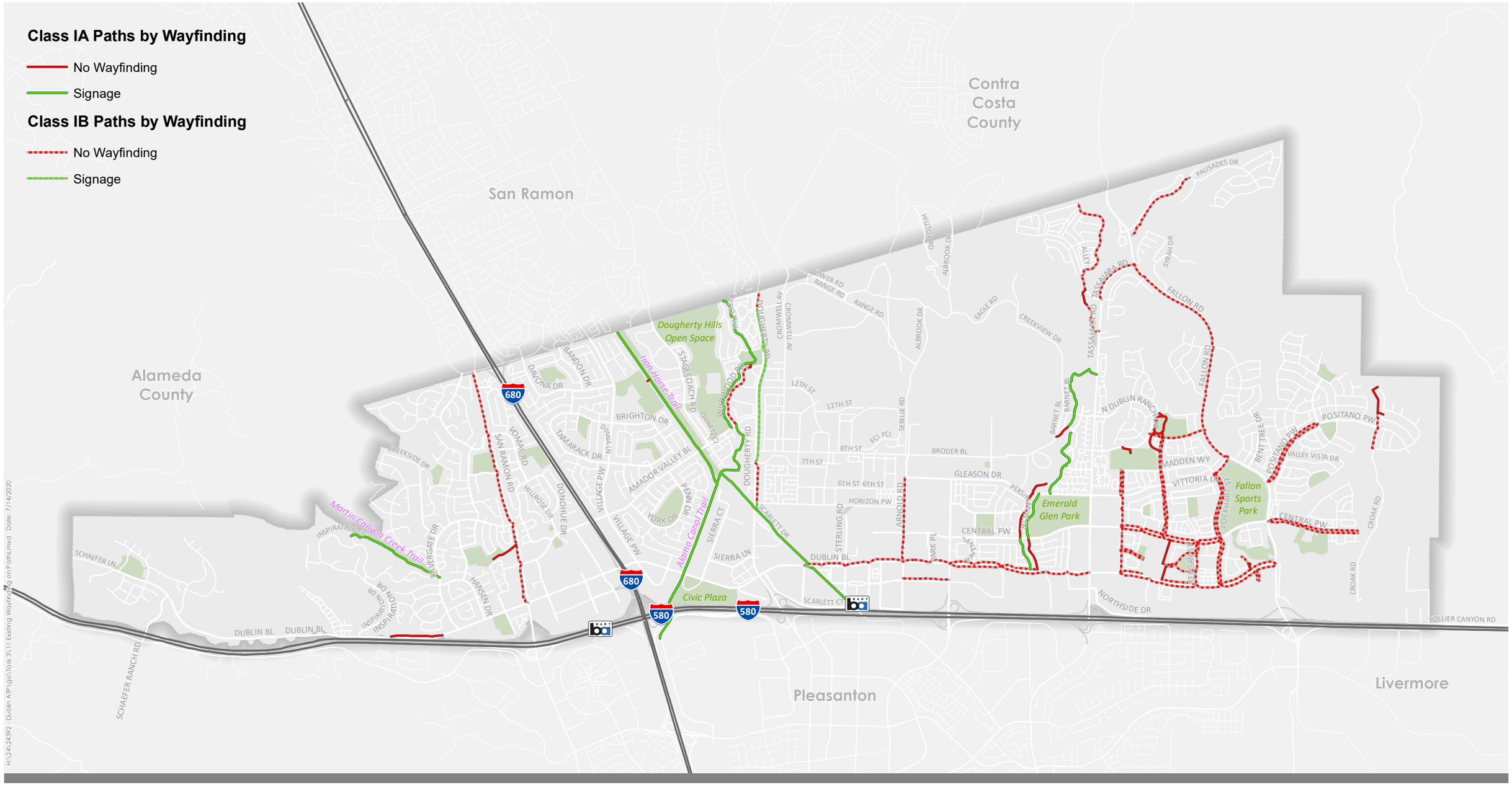

H:\24\24392 - Dublin ATP\gis\Task 3\10 Existing Path Shoulder and Buffer.mxd Date: 7/14/2020

DUBLIN CALIFORNIA

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Figure 10

**Path Shoulder and Buffer/Roadway Separation Presence**
**Dublin, California**

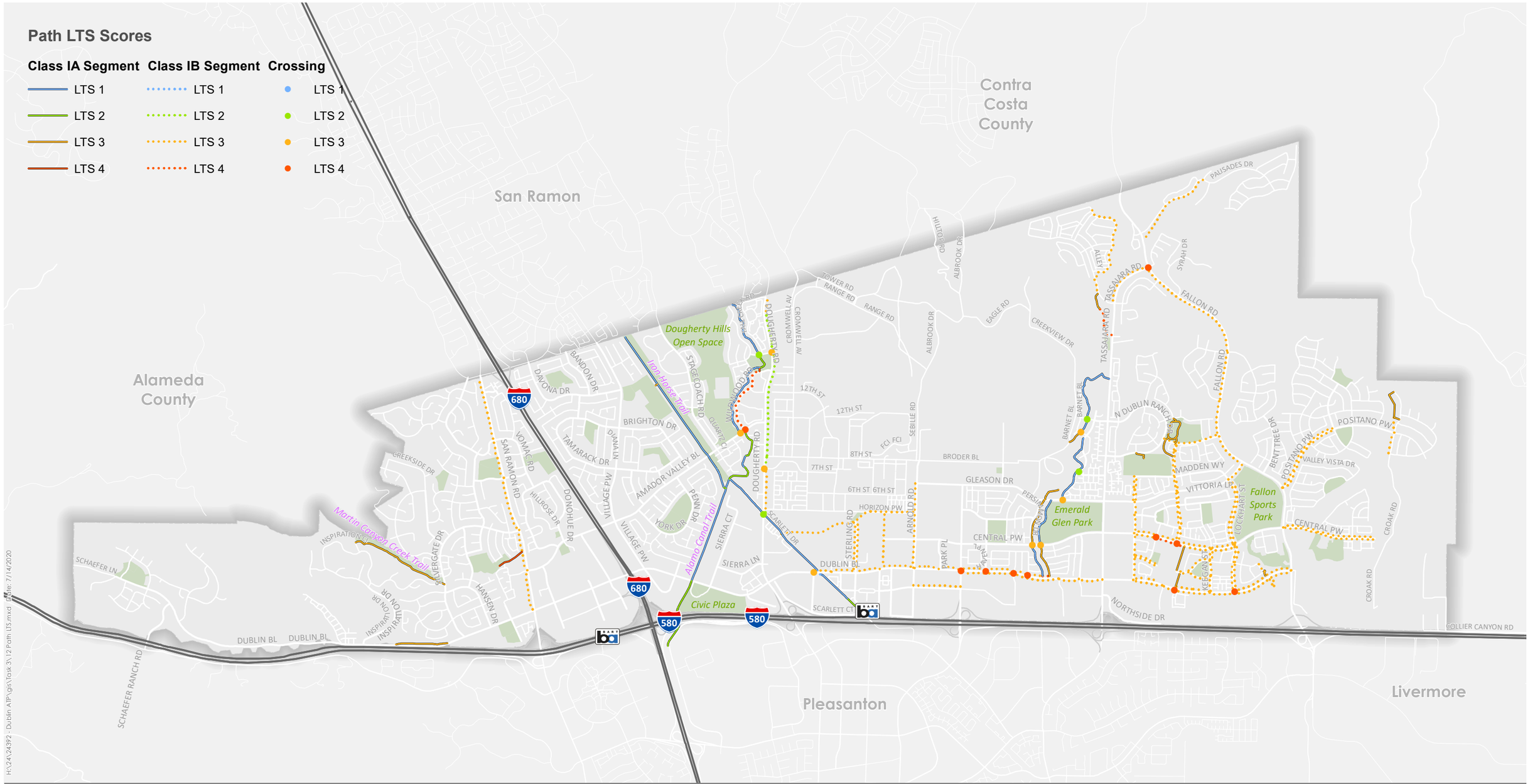



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Figure 11

**Existing Wayfinding on Paths**
**Dublin, California**




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Figure 12

**Path LTS - Segment and Crossing**
**Dublin, California**

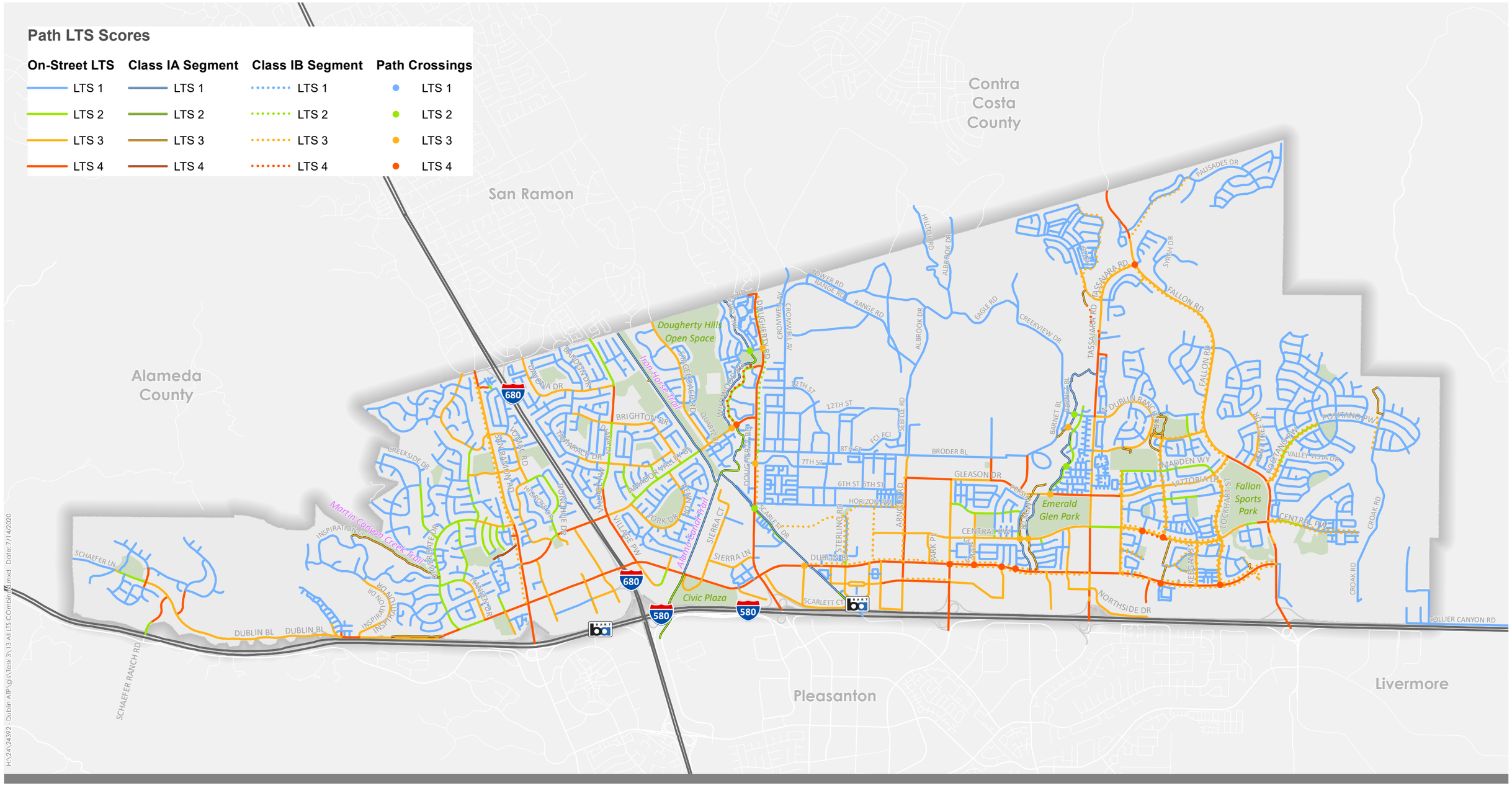



Figure 13

**On-Street and Path LTS**
**Dublin, California**

ATTACHMENT A: CLASS I PATH LTS MEMORANDUM

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# MEMORANDUM

Date: July 14, 2020 Project #: 24392

To: Sai Midididdi, TE
City of Dublin

From: Mike Alston, RSP; Amanda Leahy, AICP; & Michael Sahimi, AICP

Project: Dublin Bicycle and Pedestrian Master Plan

Subject: Class I Path LTS Methodology

## INTRODUCTION

The following memorandum presents a methodology for evaluating a level of stress along the City of Dublin's (City's) Class I path network. The City has an extensive network of designated Class I paths, provided as an alternative to on-street facilities, that vary in width, intersection treatments, and other features. In order to identify whether adequate service quality is provided on this network, these paths will be evaluated alongside the on-street level of traffic stress (LTS) methodology. The custom methodology, referred to as path LTS, will include four levels comparable to the typical level of traffic stress methodology:

- LTS 1: Requires little attention to surroundings; suitable for most children
- LTS 2: Low traffic stress; suitable for most adults
- LTS 3: Moderate traffic stress for all bicyclists
- LTS 4: High stress; only suitable for experienced bicyclists.

The City's Class I network consists of two relevant facility types:

- **Class IA Paths:** Multiuse paths along a separate alignment. Examples include the Iron Horse Trail and the Martin Creek Trail.
- **Class IB Sidepaths:** Sidepaths along the side of a roadway, which double as sidewalks. Examples include segments along the north side of Dublin Boulevard or the west side of San Ramon Road.

The 2012 Bicycle Master Plan did not subclassify Class I paths, but the distinction is necessary to evaluate the quality of service they provide. There are distinct elements of each (e.g., buffer between Class IB sidepaths and the roadway) that determine to the quality of service provided, so they are accounted for separately for this analysis. We will account for these elements to score Class IA and IB paths within the City of Dublin on a 1 to 4 path LTS rubric alongside the on-street LTS analysis. Note

that all of the Class I facilities within the City are multiuse paths (i.e., serve bicyclists and pedestrians), given that they are either off-street connections or provided along the roadside such as the only off-street accommodation. Elements of the evaluation include the following:

- Segment characteristics
  - Width
  - Path shoulder and roadway separation/buffer
  - Wayfinding and path indication
- Intersection/crossing elements
  - Control strategy and crossing distance
  - Signal treatments
  - Horizontal or vertical geometric treatments
  - Marking and signs

Segments are defined as homogenous connections between street crossings: when any of the segment input characteristics along a Class I path change, the resulting segments will be split and evaluated separately for the resulting homogeneous components. Appendix A provides an inventory of Class I facilities including their widths.

## SEGMENT CHARACTERISTICS

### Width

The Class I paths within the City are intended to serve two-way bicycle travel. The width requirements to allow for two-way bicycle travel are greater than for one-way bicycle travel. Additionally, the HDM recommends that "Development of a one-way bike path should be undertaken only in rare situations where there is a need for only one direction of travel."

- The Caltrans *Highway Design Manual* cites a minimum paved width of 8 feet for two-way bicycle travel, with 10 feet preferred. (Section 1003.1 (1)(a))
- For locations with "heavy bicycle volumes … and/or significant pedestrian traffic … expected," the HDM states that the path "should be" greater than 10 feet wide (preferably 12 feet). (Section 1003.1 (1)(a))
- Class IA multiuse paths would expect less significant pedestrian traffic than Class IB sidepaths would because Class IB sidepaths typically also serve the purpose of a sidewalk.
- According to the FHWA *Bikeway Selection Guide*, "Conflicts between path users are a primary source of injuries and can result in a degraded experience for all users where paths are not wide enough to handle the mixture and volume of diverse users."[1]

[1] The FHWA *Bikeway Selection Guide* is available online at https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf.

- The MassDOT *Separated Bicycle Lane Planning & Design Guide* provides guidance for separated bike lanes; it allows for a minimum of 8 feet (10 feet recommended) of width for bidirectional separated bike lanes to allow for two-way bicycle travel with fewer than 150 bidirectional bicyclists per hour. This does not account for pedestrian use.[2]

Width as a criteria for path LTS is combined with shoulder and roadway separation/barrier. See below and refer to Table 1.

## Path Shoulder and Roadway Separation/Buffer

### *Shoulder:*

Per Section 1003.1(1)(b), The HDM requires a minimum 2-foot-wide shoulder for Class I bike paths to serve as a recovery zone and to reduce conflicts with pedestrians. The shoulder should be composed of the same material as the path or should at least be free of vegetation: "adequate clearance from fixed objects is needed regardless of the paved width."

### *Roadway Buffer:*

Per Section 1003.1(7), the HDM recommends one of the following forms of separation for paths adjacent to the traveled way:

- A minimum separation between the edge of pavement of a bicycle path and the edge of traveled way: at least 5 feet plus shoulder widths.
- For separation less than 10 feet, landscaping or other features that form a continuous barrier should be provided.

Landscaping buffers form an adequate continuous barrier along most Class IB sidepaths in the City.

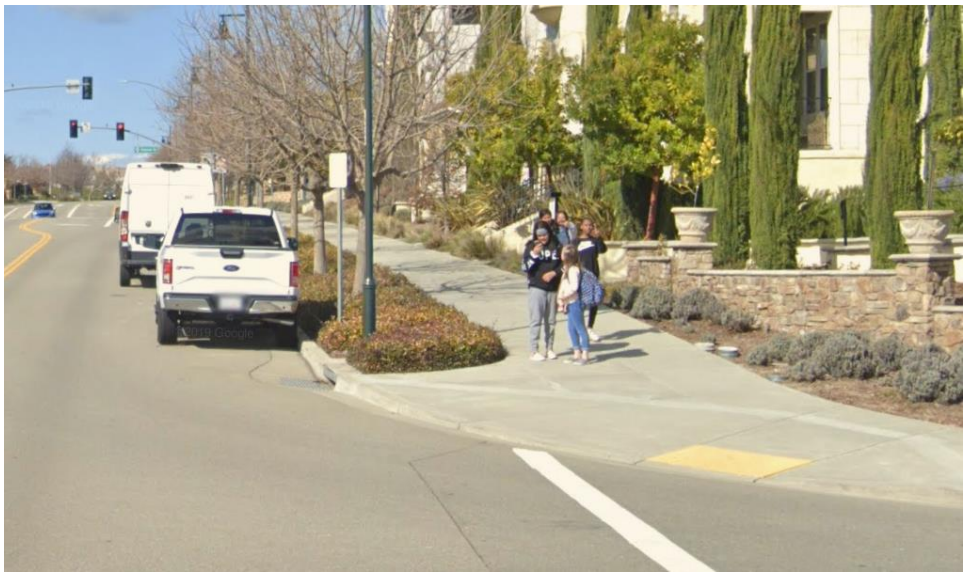
[2] Although this guidance is written for the Massachusetts Department of Transportation, it is recognized as relevant best practice guidance. It is available online at https://www.mass.gov/lists/separated-bike-lane-planning-design-guide.

**Table 1: Path LTS Score based on Width/Buffer/Shoulder**

| Path LTS Score | Class IA Multiuse Path | | Class IB Sidepath | |
|---|---|---|---|---|
| | Path width 8 ft ≤ x < 10 ft | Path Width ≥10 ft | Path Width 8 ft ≤ x < 10 ft | Path Width ≥10 ft |
| LTS 1 | ≥2 ft shoulder provided | Shoulder provided (any width) | n/a | Roadway buffer provided (continuous barrier or 10 ft separation) |
| LTS 2 | <2 ft shoulder provided | No shoulder provided | Roadway buffer provided (continuous barrier or 10 ft separation) | n/a |
| LTS 3 | No shoulder provided | n/a | n/a | No roadway buffer provided |
| LTS 4 | n/a | n/a | No roadway buffer provided | n/a |

Source: Kittelson & Associates, Inc.

**Figure 1: Example Class IB sidepath along the east side of Brannigan Street south of Gleason Drive. The path is between 8 and 10 feet wide and continuous separation from the roadway is provided by landscaping. The path would be eligible for LTS 2 based on the width/buffer/shoulder criterion.**



Source: Google Earth

## Wayfinding and Path Indication

Designated path segments should be clearly marked as such, especially including Class IB sidepaths given that they double as sidewalks. The Caltrans HDM states the following regarding mixing bicyclists and pedestrians:

> Sidewalks are not to be designated for bicycle travel. Wide sidewalks that do not meet design standards for bicycle paths or bicycle routes also may not meet the safety and mobility needs of bicyclists. Wide sidewalks can encourage higher speed bicycle use and can increase the potential for conflicts with turning traffic at intersections as well as with pedestrians and fixed objects. In residential areas, sidewalk riding by young children too inexperienced to ride in the street is common. It is inappropriate to sign these facilities as bikeways because it may lead bicyclists to think it is designed to meet their safety and mobility needs. Bicyclists should not be encouraged (through signing) to ride their bicycles on facilities that are not designed to accommodate bicycle travel. - Section 1003.3(2)

Sidewalks are thus discouraged from designation as bicycle paths. However, provided that the other criteria can be met to provide for comfortable travel (i.e., the path is "designed to meet their safety and mobility needs"), pavement or signage indications of the facility should give pedestrians an expectation that they may encounter bicyclists (and vice versa). All users should be informed that the segment is in fact designated for use as a path and not a sidewalk. Signage and wayfinding alone are therefore necessary but not sufficient to provide a low-stress path facility. This is consistent with the "weakest link" approach for path LTS evaluation. Wayfinding alone will not lower an otherwise high path LTS score but it can degrade the score of an otherwise low path LTS score facility.

**Table 2: Path LTS Score based on Segment Wayfinding/Indication**

| Path LTS Score | Class IA Multiuse Path or Class IB Sidepath |
|---|---|
| LTS 1 | Pavement markings (see Figure 2) and wayfinding signage along trail |
| LTS 2 | Wayfinding signage along path |
| LTS 3 | None provided |
| LTS 4 | n/a |

Source: Kittelson & Associates, Inc.

**Figure 2: Example pavement markings delineating road user space along a path in San Francisco, CA and (left) and indicating status as shared-use in Emeryville, CA (right)**



Source: Flickr (left) and Kittelson & Associates, Inc. (right)

## INTERSECTION/CROSSING ELEMENTS

Paths are reintroduced to motor vehicle conflicts at crossings, which can be a significant source of stress. Class IA and IB paths will be treated uniformly at intersections/crossings. According to the FHWA *Bikeway Selection Guide* (Guide), "Care should be taken at intersections and driveways … Crash patterns consistently show contra-flow movement of bicyclists are a main factor in crashes due to motorists failing to yield or look for approaching bicyclists." The Guide suggests the following to mitigate these conflicts:

- Application of separate phases at signals
- Reduced corner radii or raised crossings to slow drivers
- Improved sight lines
- Marked crossings and regulatory signs to improve driver awareness

The HDM cites two particular design elements for attention at crossings (1003.1(5)):

- Crossing control: Grade separation is desirable, followed by signalization. Where traffic is "not heavy," STOP or YIELD signs may be used for the path or for the cross street.
- Crossing location: "When crossing an arterial street, the crossing should either occur at the pedestrian crossing, where vehicles can be expected to stop, or at a location completely out of the influence of any intersection to permit adequate opportunity for bicyclists to see turning vehicles….Even when crossing within or adjacent to the pedestrian crossing, "STOP" or "YIELD" signs for bicyclists should be placed to minimize potential for conflict resulting from turning autos….In some cases, Bike Xing signs may be placed in advance of the crossing to alert motorists."

Based on these sources, the three elements to be incorporated in the Class I Path LTS will include:

- Control, geometry, and crossing distance
- Markings and signs
- Horizontal or vertical treatments

Because crossings at intersections deal with turning traffic but perpendicular trail crossings do not, separate criteria are appropriate for each, termed *intersection crossings* and *perpendicular crossings*.

**Figure 3: Intersection Class IB Sidepath Crossing along Lockhart Street at Central Parkway (left) and Class IA Perpendicular Crossing along Tassajara Creek Trail at Central Parkway (right).**



Source: Google

## Control, Geometry, and Crossing Distance

Depending on the characteristics of the crossing, different control strategies and geometric design characteristics may be appropriate.

### *Intersection Crossings*

Intersection crossings require path users to interact with turning vehicles and conflict points from all intersection approach legs. Because of this, crossing control and geometry can be used to affect conflicts in time (e.g., separate control phases) and space (e.g., separation or driver deflection).

Consistent with the recommendations in the FHWA *Bikeway Selection Guide*, physical design elements that slow drivers, enhance visibility, or both, can enhance a path's service quality. The following elements are included that would greatly improve the bicyclist' experience at crossings:

- A "bend-out" design (see Figure 4) or a protected intersection-style corner safety island that offsets the crossing from vehicle turning movements (only applicable at intersections). . Although this design treatment is most applicable to a Class II or Class IV bicycle lane, the separation benefit applies for intersection or driveway crossings along a Class IB sidepath.
- A bulb-out which reduces the curb return radius and turning movement speeds. This treatment is most effective when the lane geometry of the turning and receiving roadways force a driver to adhere to the reduced radius.
- A raised crossing, which includes vertical deflection and reduces driver speeds.
- A right-turn pocket or channelized vehicle turn lane with sufficient sight distance and geometry to encourage a comfortable provide a path crossing. The dedicated right-turn pocket or lane provides drivers the opportunity to yield without through traffic behind them.
- Signal phasing solutions including a separated bicycle signal phase or a leading pedestrian interval/leading bicycle interval, which provide separation in time between motor vehicles and path users.

**Figure 4: "Bend Out" concept that pulls a bicycle crossing back from the curb to improve visibility to drivers**




In applying this criterion, the geometric treatments are referred to as *horizontal or vertical treatments* and may be considered interchangeably.

### *Intersection Applicability*

The criterion presented in Table 3 applies to path crossings either at a signalized intersection or along an uncontrolled roadway at an unsignalized crossing (i.e., the major street). For Class IB sidepaths crossing alongside a stop-controlled intersection, the criteria in Table 4 apply.

**Table 3: Intersection Crossing LTS Score based on Control Strategy and Crossing Distance**

| Path LTS Score | Control Strategy and Crossing Distance | | | |
|---|---|---|---|---|
| | 2-lane total cross-section (both roadways) | | >2-lane cross-section (Either roadway) | |
| | Signalized Intersection | Unsignalized Intersection | Signalized Intersection | Unsignalized Intersection |
| LTS 1 | Leading bicycle interval, separated signal phase, or horizontal/vertical elements | All-way Stop Control, parallel speed ≤ 25 mph | Separated bicycle signal phase | n/a |
| LTS 2 | Parallel speeds <40 mph | All-way Stop Control, parallel speed > 25 mph; *OR* Parallel speeds ≤ 25 mph or with vertical/horizontal elements | Leading bicycle interval or horizontal/vertical elements | All-way Stop Control; *OR* Parallel speeds ≤25 mph or with vertical/horizontal elements |
| LTS 3 | Parallel speeds ≥40 mph | Parallel speeds <40 mph | Parallel speeds <40 mph | Parallel speeds <40 mph |
| LTS 4 | n/a | Parallel speeds ≥40 mph | Parallel speeds ≥40 mph | Parallel speeds ≥40 mph |

Source: Kittelson & Associates, Inc.

### *Perpendicular Crossings*

As discussed above, the control strategy appropriate for perpendicular crossings depends on the characteristics of the road being crossed: speed, volume, and crossing distance. For a simplified approach, the number of lanes provides a measure of crossing distance and a proxy for vehicle volume.

**Table 4: Perpendicular Crossing LTS Score based on Control Strategy and Crossing Distance**

| Path LTS Score | Perpendicular Crossing Control Strategy and Crossing Distance | |
|---|---|---|
| | **2-lane total cross-section** | **>2-lane cross-section** |
| LTS 1 | RRFB, PHB, or signal control;<br>*OR*<br>Raised crossing with yield control | Signal control |
| LTS 2 | Stop or yield control, Cross street speed < 40 mph | RRFB, PHB<br>*OR*<br>Stop or yield control; cross street ≤ 25 mph |
| LTS 3 | Stop or yield control; Cross street speed ≥ 40 mph | Stop or yield control; cross street speed > 25 mph |
| LTS 4 | n/a | Stop or yield control; cross street speed ≥ 40 mph |

Source: Kittelson & Associates, Inc.

## Markings and Signs

This criterion only applies for intersection crossings, where drivers may not be expecting two-way or same-direction Class IB sidepath bicycle travel as they approach a crossing. (This includes all crossings at unsignalized intersections.) Thus, indication of a path crossing is helpful to reduce the stress of a facility. As previously described, the HDM (Section 1003.1(5)) recommends that crossing signs may be placed in advance of a crossing to alert motorists. Example signs include the combination of the MUTCD W11-15 and W11-15P signs, depicted in Figure 5, and described in Section 9B.18 of the California MUTCD. Figure 5 also depicts crossing markings already applied at various intersection crossings in the City.

**Figure 5: W11-15 (left), Supplementary W11-15P (middle), and Path Pavement Markings in Dublin (right)**




Source: CA-MUTCD; Google

**Table 5: LTS Score based on Markings and Signage**

| Path LTS Score | Markings and Signage |
|---|---|
| LTS 1 | Signage **and** pavement markings indicating path crossing |
| LTS 2 | Signage **or** pavement markings indicating path crossing |
| LTS 3 | No signage or pavement markings indicating a path crossing |
| LTS 4 | n/a |

Source: Kittelson & Associates, Inc.

**Table 6: Combined Path LTS Criteria. Methodology observes a "weakest link" application whereby the highest score for any single criterion governs the overall path LTS score.**

| Criteria | | | | LTS 1 | LTS 2 | LTS 3 | LTS 4 |
|---|---|---|---|---|---|---|---|
| Segment | | | | | | | |
| Class IA | Width / Buffer / Shoulder | Path Width: 8 ft ≤ x <10 ft | | ≥2 ft shoulder provided | <2 ft shoulder provided | No shoulder provided | n/a |
| | | Path Width: ≥10 ft | | Shoulder provided (any width) | No Shoulder provided | n/a | n/a |
| | Wayfinding / Indication | | | Pavement markings (see Figure 2); Wayfinding signage along path | Wayfinding signage along path | None provided | n/a |
| Class IB | Width / Buffer | 8 ft ≤ x <10 ft | | n/a | Roadway buffer provided (continuous barrier or 10 ft separation)[1] | n/a | No separation provided |
| | | ≥10 ft | | Roadway buffer provided (continuous barrier or 10 ft separation)[1] | n/a | No separation provided | n/a |
| | Wayfinding / Indication | | | Pavement markings designating space for path users (see Figure 2); Wayfinding signage | Wayfinding signage along path | None provided | n/a |
| Crossing | | | | | | | |
| Intersection Crossing | Control, Geometry, Crossing Distance | 2-lane Total Cross-Section (both roadways) | Signalized | Leading bicycle interval, separated bicycle signal phase, or horizontal/vertical elements | Parallel speeds <40 mph | Parallel speeds ≥40 mph | n/a |
| | | | Unsignalized | All-way stop control, parallel speeds ≤25 mph | All-way stop control, parallel speeds >25 mph *OR* Parallel speeds ≤25 mph or with vertical/horizontal elements | Parallel speeds <40 mph | Parallel speeds ≥40 mph |
| | | >2-lane Total Cross Section (either roadway) | Signalized | Separated bicycle signal phase | Leading bicycle interval or horizontal/vertical elements | Parallel speeds <40 mph | Parallel speeds ≥40 mph |
| | | | Unsignalized | n/a | All-way stop control *OR* Parallel speeds ≤25 mph or vertical/horizontal elements | Parallel speeds <40 mph | Parallel speeds ≥40 mph |
| | Markings / Signs* | | | Signage **and** pavement markings indicating path crossing* | Signage **or** pavement markings indicating path crossing* | No signage or pavement markings indicating a path crossing* | n/a |
| Perpendicular Crossing | Control, Geometry, Crossing Distance | 2-lane Total Cross-Section | | RRFB, PHB, or signal control, *OR* Raised crossing with yield control | Stop or yield control, speed < 40 mph | Stop or yield control, speed ≥ 40 mph | n/a |
| | | >2-lane Total Cross Section | | Signal control | RRFB or PHB; *OR* Stop or yield control, cross street ≤ 25 mph | Stop or yield control, cross street > 25 mph | Stop or yield control, cross street speed ≥ 40 mph |

*Criterion does not apply to all-way stop control crossings.
Source: Kittelson & Associates, Inc.

ATTACHMENT A: CLASS I FACILITIES – WIDTH INVENTORY

**Table 7: Class I Facility – Width Inventory**

| Trail | Path Type | Location | Width |
|---|---|---|---|
| Martin Creek Canyon Trail | Class IA | Bidirectional - one side only | 7’ |
| Dublin Boulevard | Class IA | N side --- west of Silvergate | 4.5’ |
| San Ramon Road sidepath | Class IB | West side of roadway | 10’ |
| Unnamed trail branching west off of San Ramon Road | Class IA | Connection to Mape Memorial Park | Varies; 7-8’ |
| Alamo Canal Trail | Class IA | Continuous | ≥10’ |
| Iron Horse Trail | Class IA | Continuous | ≥10’ |
| Dougherty Road | Class IB | E Side – Scarlett to N City Limits | 9 to 14’ from Scarlett to Fall Creek; 8’ Fall Creek to N. City Limits |
| Dublin Boulevard | Class IB | N side -- Iron Horse Trail to Tassajara Creek | 12’ |
| Dublin Boulevard | Class IB | S side - Hacienda Drive to Tassajara Road | 8’ |
| Martinelli Way | Class IB | N side b/w Arnold and Hacienda | 8.5’ |
| Brannigan Street | Class IB | East side - Dublin to Fallon Middle School | 8' |
| Brannigan Street | Class IA | West side - Gleason to Fallon Middle school | 8’ |
| Horizon Parkway (In Progress) | Class IB | N side - Scarlett to Arnold | 10’ |
| Sterling Road (In Progress) | Class IB | Both sides - Dublin to Horizon | 10’ |
| Iron Horse Parkway (In Progress) | Class IB | E Side – Dublin to Horizon | 10’ |
| Arnold Way | Class IB | W Side – Dublin to Gleason | ≥10’ |
| Central Parkway | Class IB | N side - Brannigan to Lockhart | 8’ |
| Central Parkway | Class IB | S side - Brannigan to Lockhart | Varies; 5-8’ |
| Dublin Boulevard | Class IB | S side - Brannigan to Grafton | 8’ |
| Dublin Boulevard | Class IB | N side - Brannigan to Finnian Way | 8’ |
| Dublin Boulevard | Class IB | N side – Finnian Way to Grafton | 7’ |
| Tassajara Creek Trail | Class IA | Continuous | ≥10’ |
| Finnian Way | Class IB | S side - Brannigan St to Bray Commons | 8’ |
| Finnian Way | Class IB | N side - Brannigan St to Bray Commons | 8’ |

| Trail | Path Type | Location | Width |
|---|---|---|---|
| Grafton Street | Class IB | W side - Central to Fairfield Park | 12’ |
| Grafton Street | Class IB | E side - Central to Fairfield Park | 8’ |
| Lockhart Street | Class IB | E side - N of Dublin to Gleason | 12’ |
| Positano Pkwy | Class IB | S side - Fallon to school | 8' |
| Positano Pkwy | Class IB | N side - Fallon to school | 8' |
| Antone Way | Class IB | N side - Dublin Ranch to Fallon | 40’ |
| Fallon Road | Class IB | W side - Gleason to Tassajara | 12' |
| Sterling Street | Class IB | Dublin to Central | 8' |
| Central Parkway | Class IB | Fallon to eastern extents | 8’ |
| Central Parkway | Class IB | Fallon to eastern extents | 8’ |
| Wallis Ranch Drive | Class IB | W side between Tassajara Creek and Stags Leap | 8' |
| Rutherford Drive | Class IB | E side from Tassajara to trail connection | 8' |
| Trail parallel to Croak Road/Volterra Drive | Class IB | S. Terracina to N extents of Volterra | Varies; 9 - 10’ |

# APPENDIX B

# EXISTING CONDITIONS: DEMAND ANALYSIS

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# TECHNICAL MEMORANDUM

**Dublin Bicycle and Pedestrian Master Plan Update**

Draft Demand Analysis Results - Bicycle Access

| | | |
|---|---|---|
| Date: | May 10, 2021 | Project #: 24392 |
| To: | Sai Midididdi, TE | |
| From: | Mike Alston, RSP; Amanda Leahy, AICP | |
| cc: | Pratyush Bhatia | |

The City of Dublin (City) is updating its 2014 Dublin Bicycle and Pedestrian Master Plan (Plan). The Plan will serve as a comprehensive action plan for the City to provide improved bicycle and pedestrian facilities for its residents, employees, and visitors.

Per the scope of work, the demand analysis task (Task 3.3.4) identifies baseline levels of walking and biking around existing activity nodes and assesses latent bicycle and pedestrian demand that could be realized through improved infrastructure recommended in the Plan. The intent of this task to indicate the magnitude of potential latent demand for walking and biking based on a set of assumptions about the known relationship between infrastructure and mode choice. There are a number of other factors that influence mode choice decisions and could provide a more precise estimate of mode share which are beyond the intent and scope of this task.

Mode share estimates based on existing infrastructure will be compared to estimates for a future recommended network to determine potential mode shift. This potential for mode shift associated with latent demand will be presented in the Plan. The outputs from this analysis will also serve as inputs for network prioritization as part of Plan development.

This memorandum (memo) is organized as follows:

- Summary
  - Assumptions and Methodology
  - Results
  - Next Steps
- Biking and Walking Typologies for Dublin
- Mode Share Data
- Detailed Results
- Map Figures
- Appendices A through F

# SUMMARY

This latent demand analysis presents mode share estimates for Dublin residents to access four categories of activity centers: schools, BART stations, job centers, and parks. These results will be compared to access for a recommended improved network that will show the potential for an improved biking and walking network to unlock latent demand for biking and walking. The Plan will present the potential for mode shift associated with recommended improvements.

## Assumptions and Methodology

For both biking and walking, the existing network is compared to a future network by modeling mode choice sensitivity to changes in the built environment, including presence and quality of bicycle and pedestrian infrastructure. For biking, potential mode shift indicative of latent demand is assessed through the availability of low-stress bicycle routes as measured by bicycle level of traffic stress (LTS) scores. For walking, potential mode shift is assessed through modeling uncontrolled crossings along major roadways in the City as crossing barriers.

Kittelson used available land use and demographic data to model residential locations and their network distance (i.e., distance along available paths) to activity centers. The path of travel for Dublin residents was blocked or impeded at identified barriers, with the resulting perceived network distances increased. Propensity to walk or bike is estimated based on perceived travel distance to destinations.

More detail on the analysis methodology is presented in the methodology memo in Appendix A.

## Results

### *How to interpret these results*

For each activity center, a mode share point estimate is presented that represents the share of the Dublin population that *could be expected* walk or bike to a given destination given their natural propensity to walk or bike, their distance to the destination, and the quality of the infrastructure available. These estimates were determined by four inputs:

1. **Demographic data:** Dublin residents are grouped into differing walking and biking *typology* groups based on age; these groups are assumed to exhibit different propensities to walk or bike and responsiveness to supportive infrastructure (explained in the *Biking and Walking Typologies in Dublin* section).
2. **Network distance to destination:** The actual network distance between residential parcels in the City and each activity center is determined based on the shortest available route.

3. **Barriers or impediments:** For walking, uncontrolled crossings of major roads either block or impede an available walking route.[1] For biking, a high LTS score (3 or 4) similarly blocks or impedes available routes. Barriers block access and require a different route; impediments increase the *perceived* travel distance which in turn decreases likelihood of walking or biking.
4. **Available mode share data:** Kittelson used data from the National Household Travel Survey (NHTS), BART station profile surveys, the American Community Survey (ACS), and Safe Routes to School (SRTS) mode share surveys to estimate the percentage of people walking and biking and the relationship between mode share and distance from destination. Kittelson constructed a lookup table (shared in the *Mode Share Data* section of this memorandum) to estimate percentage of the population to walk or bike for a given perceived distance to destination (e.g., a higher share of people would walk for a 0.5-mile trip compared to a 1-mile trip).

An example of the mode share estimation procedure is provided in Appendix G.

### *Existing Network – Bicycle Access*

The analysis produces the following results based on the existing bicycle network:

- **Schools:** Walk and bike share estimates are provided for each school. Biking estimates range between 0 percent and 14 percent, and walking estimates range between 13 and 37 percent. The availability of low-stress bicycle routes (i.e., comprised exclusively of LTS 1 or 2 facilities) on routes to school varies depending on the school location.
  - For two elementary schools, a low-stress biking route is available to over half of students. Six schools are located with a low-stress biking route available to 10 percent or fewer of students.
  - In general, elementary schools serve a more localized population of students and have a natural opportunity for higher biking or walking shares than the middle or high schools, which serve a broader geographic area with longer travel distances.
- **BART:** A mode share estimate is provided for access to *either* the West Dublin/Pleasanton or Dublin/Pleasanton BART station. The biking mode share estimate among Dublin residents is 6 percent overall, and the walking mode share estimate is 11 percent overall.
  - These mode share estimates should be interpreted with caution, as they do not account for trip type and origin-destination pairs (e.g., which residents have job locations that make BART a feasible option). Rather, they represent estimated propensity to walk or bike to BART for Dublin residents based on distance and infrastructure availability.
  - Approximately 40 percent of Dublin residents are able to access the closest BART station using a low-stress biking route.

[1] *Major roads* were determined collaboratively with the City, using the FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossings* as a reference point. More details are provided in Appendix A.

- **Job Centers:** A mode share estimate is provided for each of the seven job centers identified. Biking mode share estimates range between 1 and 3 percent, and walking mode share estimates range between 4 and 9 percent.
  - These mode share estimates should be interpreted with caution, as they do not represent true home and job location combinations but instead represent estimated propensity for Dublin residents to walk or bike to each job center based on distance and infrastructure availability.
  - The availability of low-stress bike routes varies depending on job center location. The share of Dublin residents with a low-stress bicycle route available to each job center ranges from approximately 19 percent to 37 percent.[2]
- **Parks:** A mode share estimate is provided for access to *any* park for each resident. Bike mode share is estimated to be 3 percent overall, and walking share is estimated to be 62 percent.
  - These mode share estimates should be interpreted with caution, as they do not represent all park trips but instead represent estimated propensity to walk or bike for Dublin residents to their nearest available park (i.e., walking- or biking-accessible parks to residents).
  - Overall, 41 percent of Dublin residents have a low-stress biking route to their nearest City park.

## Next Steps

The mode share estimates and the summary of residents with low-stress biking access to activity centers will be included in the Plan and available to the City to demonstrate the potential benefit of infrastructure improvements in the future. The maps and descriptions displaying biking and walking perceived distances provide an indication of the availability of low-stress biking routes and of direct walking routes that promote walking and biking. As a next step, Kittelson will work with the City to identify roadway and path network segments that impede or prevent walking and biking access to highlight for the Task 4 prioritization.

The following Plan goals are relevant to the findings of this analysis:

- **Goal 3: Improve Connectivity** – Develop a bicycle and pedestrian network that provides well-connected facilities for users of all ages and abilities.
- **Goal 5: Prioritize Investments –** Maintain sufficient funding to provide for existing and future bicycle and pedestrian needs; including supporting programs, operations, and maintenance. Leverage biking and walking projects to promote economic activity and social equity outcomes among people of all ages and abilities.

The results of this analysis, especially the mapped results illustrating barriers to low-stress biking routes and walking routes, allow the project team to address both goals through this and subsequent tasks.

[2] "Bicycle route available" indicates that a feasible route exists between origin and destination based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities)

## BIKING AND WALKING TYPOLOGIES FOR DUBLIN

For this analysis, the Dublin population was grouped into biking and walking typologies based on age. The typologies represent varying propensities to walk and bike and varying sensitivities to infrastructure quality.

Table 1 presents the estimated distribution of bicyclist types by age group in Dublin, and Table 2 presents the effect calculated LTS score has on biking access as modeled in this analysis. More details of the bicyclist type definitions and determinations are included in the methodology memo, which is attached as Appendix A.

**Table 1: Bike Group Typology – Assumed Share of Biker Type by Age Group**

| Type | Biker Type Share of Age Group (Columns Sum to 100%) | | | | |
|---|---|---|---|---|---|
| | Under 5 | 6 - 18 | 18 - 34 | 35 – 54 | 55+ |
| *Strong and Fearless* | 0% | 0% | 11% | 2% | 0% |
| *Enthused and Confident* | 0% | 0% | 7% | 12% | 7% |
| *Interested but Concerned* | 0% | 100% | 61% | 59% | 46% |
| *No Way, No How* | 100% | 0% | 21% | 27% | 47% |
| **Total** | **100%** | **100%** | **100%** | **100%** | **100%** |

Source: Table developed by Kittelson & Associates, Inc. from data presented by Dill and McNeil

**Table 2: Impedance Factors for Bike Network**

| LTS Value of Roadway | Impedance Effect for Biking Groups | | | |
|---|---|---|---|---|
| | *No Way, No How* | *Interested but Concerned* | *Enthused and Confident* | *Strong and Fearless* |
| LTS 1 / 2 | **No Access** | No effect | | |
| LTS 3 | **No Access** | **Absolute Impedance:** Cannot use segment | **Relative impedance:** 1.5 distance multiplier along segment[1] | No effect |
| LTS 4 | **No Access** | **Absolute Impedance:** Cannot use segment | **Absolute Impedance:** Cannot use segment | No effect |

[1]This impedance factor is based on research by Broach, Gliebe, and Dill "Bicycle Route Choice Model Developed Using Revealed Preference GPS Data" indicating how far riders will diverge from the shortest path to avoid higher stress facilities

Table 3 presents the modeled walking population types by age and the effect infrastructure has on their walking routes as modeled in this analysis. More details of the walking type definitions and determinations are included in the methodology memo, which is attached as Appendix A.

**Table 3: Proposed Impedance Factors for Walking Network**

| Infrastructure condition | Impedance Effect for Walking Group | | |
|---|---|---|---|
| | Youth (≤14) | Teenage and Working Age Adults (15-55) | Aging (56 +) |
| Known Sidewalk gap[1] | **Absolute impedance:** Breaks network; inaccessible route | | |
| Uncontrolled crossing of high-volume roads | **Absolute impedance:** Breaks network; inaccessible route | **Relative Impedance:** Adds 2.5 minutes to journey[2] | **Absolute impedance:** Breaks network; inaccessible route |

[1] Comprehensive sidewalk gaps were not available, but sidewalk gaps were observed and modeled along major roadways.

[2]For this population, the route is available but is given the additional time penalty to approximate travel delay and general undesirability of crossing.

Source: Table developed by Kittelson & Associates, Inc.

## MODE SHARE DATA

The mode share values used to estimate biking mode share are derived from a number of sources:

- City of Dublin and Alameda County Transportation Commission *Safe Routes to School* reports, including comparison among reported mode share data from assessments for Dougherty Elementary School, for Dublin Elementary School, and countywide. Detailed information is included in Appendix B.
- BART station profile access surveys. These surveys produce mode share estimates for each BART station, available online.[3] Kittelson worked with BART to identify home-based travel mode share to Dublin BART stations based on respondents' home location and distance to the nearest station. Detailed information is included in Appendix C.
- 2017 National Household Travel Survey (NHTS) data, conducted by the Federal Highway Administration with assigned travel dates from April 19, 2016 through April 25, 2017. The California Department of Transportation (Caltrans) participated in an add-on program to purchase extra household samples, resulting in 26,095 household samples statewide. The results presented below are based on a query within the 26,095 samples to reduce trips to those in Alameda and Contra

[3] https://www.bart.gov/about/reports/profile

Costa Counties, with place type defined "Suburban." Appendix D includes a memo describing the place typology development; Figure 3 in that memo shows an overlay of place type which includes Dublin in the suburban neighborhood category.

- 2015-2019 American Community Survey (ACS) data, which includes data on residents' commute mode share and is available at the Census block group level and at higher spatial resolutions.

## DETAILED RESULTS

Mode share estimates for existing conditions are presented by activity center and are organized as follows:

- **Schools:** All public K-12 schools within Dublin Unified School District
- **BART:** West Dublin/Pleasanton station and Dublin/Pleasanton station
- **Job Centers:** A number of job centers within Dublin identified with City staff
- **Parks:** Neighborhood and community parks in Dublin, as identified in the City's Parks and Recreation Master Plan and confirmed with City staff.

Mode share estimates vary by destination because people have different mode selection choices based on trip type and the characteristics of their destinations. Discussion of each activity center includes a table or chart illustrating the distribution of the relevant Dublin population by perceived travel distance as well as mode share estimates. Accompanying maps provide visual representation of available routes to activity centers. The mode share estimates should be interpreted with caution, as they are point estimates indicating estimated propensity for Dublin residents to walk or bike based on home location and distance to activity centers. However, they do not account for the remaining multitude of variables that impact mode share— including for example parking availability, household vehicle access, income and wealth level, disability status, trip chaining, and other infrastructure factors not collected, and many other factors. Constructing precise mode share estimates including those factors is beyond the scope of this task.

Table 4 presents the lookup values used for biking and walking estimates based on perceived distance. These lookup values are estimates based on the best available data for this task. An example illustrates how this table was used:

- The top row, "0 -1/8 miles," indicates 79 percent walking and 5 percent biking to parks.
- This is the percent of the population estimated to have a perceived travel distance in that range to their nearest park.
- This process was repeated at every distance range listed.

**Table 4: Biking and Walking Mode Share by Activity Center Type and Distance**

| Distance (Miles) | Activity Center Type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | School[1] | | BART[2] | | Job Centers[3] | | Parks[4] | |
| | Walk | Bike | Walk | Bike | Walk | Bike | Walk | Bike |
| 0 – 1/8 | 55% | 25% | 85% | 10% | 75% | 0% | 79% | 5% |
| 1/8 – 1/4 | 55% | 30% | 85% | 10% | 75% | 0% | 79% | 5% |
| 1/4 – 3/8 | 40% | 30% | 80% | 10% | 45% | 1% | 67% | 9% |
| 3/8 – 1/2 | 40% | 25% | 80% | 10% | 45% | 1% | 67% | 9% |
| 1/2 – 5/8 | 16% | 20% | 66% | 14% | 13% | 6% | 42% | 9% |
| 5/8 – 3/4 | 16% | 20% | 66% | 14% | 13% | 6% | 42% | 9% |
| 3/4 – 7/8 | 16% | 15% | 50% | 12% | 13% | 6% | 42% | 9% |
| 7/8 – 1 | 16% | 15% | 50% | 12% | 13% | 6% | 42% | 9% |
| 1 – 1-1/8 | 10% | 10% | 29% | 8% | 6% | 9% | 22% | 9% |
| 1-1/8 – 1-1/4 | 10% | 10% | 29% | 8% | 6% | 9% | 22% | 9% |
| 1-1/4 – 1-3/8 | 10% | 10% | 12% | 8% | 6% | 9% | 22% | 9% |
| 1-3/8 – 1-1/2 | 10% | 10% | 12% | 8% | 6% | 6% | 22% | 9% |
| 1-1/2 – 1-5/8 | 0% | 1% | 7% | 8% | 3% | 14% | 10% | 4% |
| 1-5/8 – 1-3/4 | 0% | 1% | 7% | 8% | 3% | 14% | 10% | 4% |
| 1-3/4 – 1-7/8 | 0% | 1% | 5% | 8% | 3% | 14% | 10% | 4% |
| 1-7/8 – 2 | 0% | 1% | 5% | 8% | 3% | 14% | 10% | 4% |
| 2+ | 0% | 1% | 2% | 7% | 1% | 10% | 6% | 3% |

[1]Data are based on comparison among reported mode share data from *Safe Routes to School* Assessments at Dougherty Elementary School, at Dublin Elementary School, and countywide.
[2]Data are based on BART's 2015 Station Access Profiles, available at https://www.bart.gov/about/reports/profile.
[3]Data are based on NHTS work-based trips from the above-described sample.
[4]Data are based on NHTS recreational trips from the above-described sample.
[5]Biking and walking mode share would taper off further at distances greatly exceeding 2 miles, but residents' access distance as modeled here never greatly exceeds 2 or 3 miles given the size of Dublin. Hence, for simplicity, the outer distance band for this analysis is "2+ miles."

## Schools

The school analysis was conducted based on residential location and school enrollment information provided by the Dublin Unified School District. The data used to calibrate the mode share estimates are provided in Table 4 and Appendix B. The estimated walking and biking mode share by school is presented in Table 5. The perceived walking and biking distances for students at each school, along with mode share estimates, are provided in Figure 1 and Figure 2.

**Table 5: Mode Share Estimates by School**

| School | Walking | Biking | Share of student population with bicycle route available[1] |
|---|---|---|---|
| Amador Elementary | 28% | 14% | 55% |
| Cottonwood Creek K-8 | 35% | 7% | 27% |
| Dougherty Elementary | 36% | 10% | 35% |
| Dublin Elementary | 23% | 1% | 5% |
| Dublin High | 13% | 0% | 0% |
| Fallon Middle | 23% | 2% | 8% |
| Frederiksen Elementary | 24% | 0% | 1% |
| Green Elementary | 31% | 6% | 22% |
| Kolb Elementary | 37% | 14% | 53% |
| Murray Elementary | 24% | 0% | 0% |
| Wells Middle | 16% | 0% | 0% |

[1]This statistic measures the portion of the population who have a bicycle route available based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities but the *Strong and Fearless* population rides on all facilities)

Source: Prepared by Kittelson & Associates, Inc.

### *Walking*

For elementary and middle schools all students are modeled as *youth*: they do not cross at uncontrolled crossings along major roads. All high school students are modeled as *teenage and working age adults*: uncontrolled crossings along major roads are modeled as impediments that increase perceived travel distance but do not fully block access.

Dougherty Elementary exhibits the highest estimated walk share at 36 percent, which is close to the available mode share survey data of 39 percent (see Appendix B). Other elementary schools similarly exhibit high estimated walk shares, due in part to the localized nature of their student population compared to middle and high schools.

The perceived walking distances for students at each school, along with mode share estimates, are provided in Figure 1. Walking access for each school is mapped in Figure W.S.1 through Figure W.S.11 (presented in the *Map Figures* section).

### *Biking*

All students are assumed to be *Interested but Concerned* bicyclists because of their age range: the do not ride on LTS 3 or 4 segments. Mode share estimates for each school range between 0 percent and 14 percent. The percentage of students with a complete low-stress biking route from home to school ranged between 0 and 55 percent by school.

The analysis results in a 0 percent biking mode share estimate for Dublin High, Frederiksen Elementary, Murray Elementary, and Wells Middle School. As described already in this memo, this estimate is not intended to claim that zero students ride to school; it is a point estimate based on propensity to bike as a result of infrastructure availability and quality. Biking access to both schools is provided along roadways that have LTS scores of 3 or 4, resulting in a barrier to low-stress access. Reducing LTS along roadways providing access to these two schools has the potential to result in a substantial bicycle access mode shift.

The perceived biking distances for students at each school, along with mode share estimates, are provided in Figure 2. Biking access for each school is mapped in Figure B.S. through B.S.11.

**Figure 1: Share of School Population by Perceived Walking Distance and Estimated Walking Mode Share**

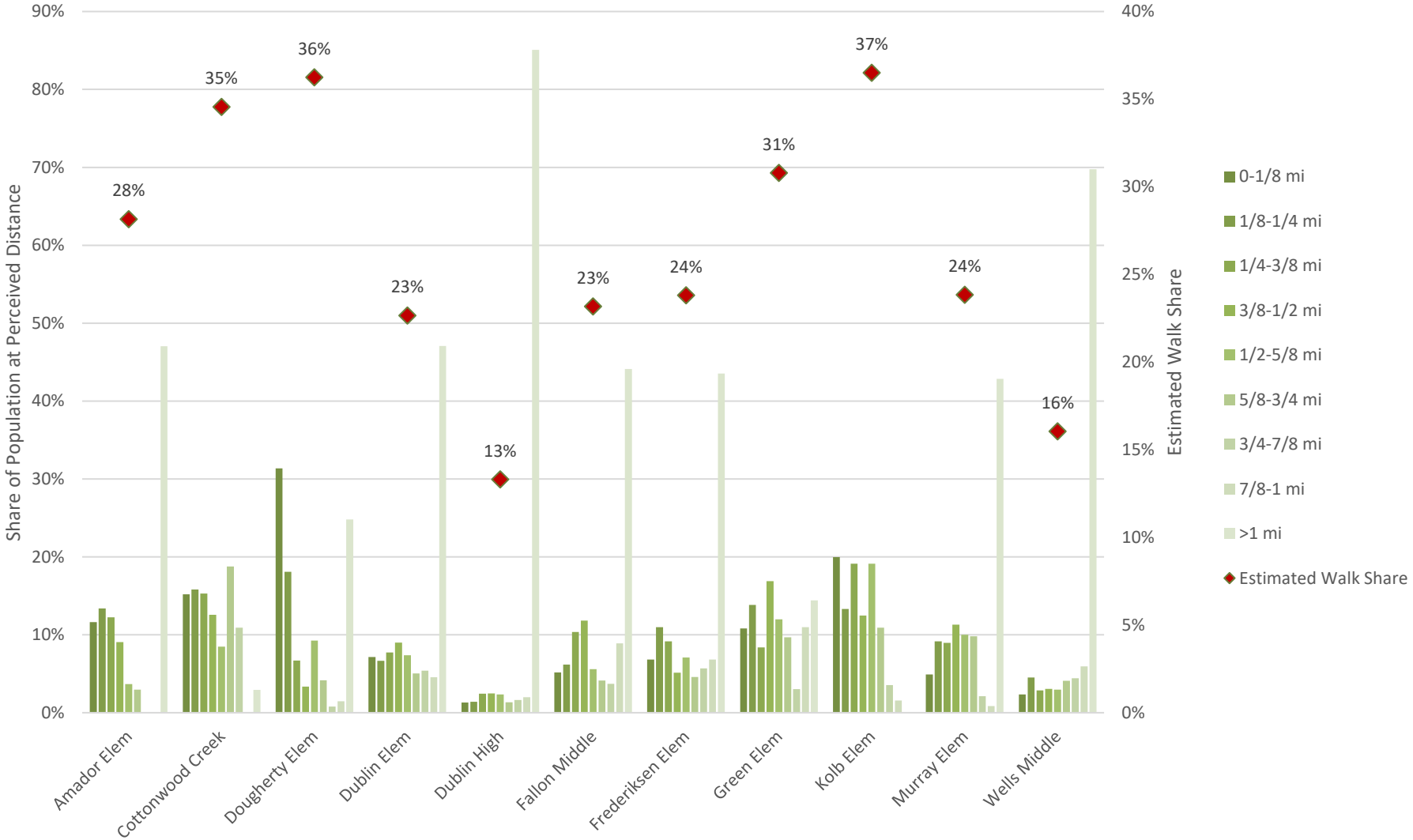
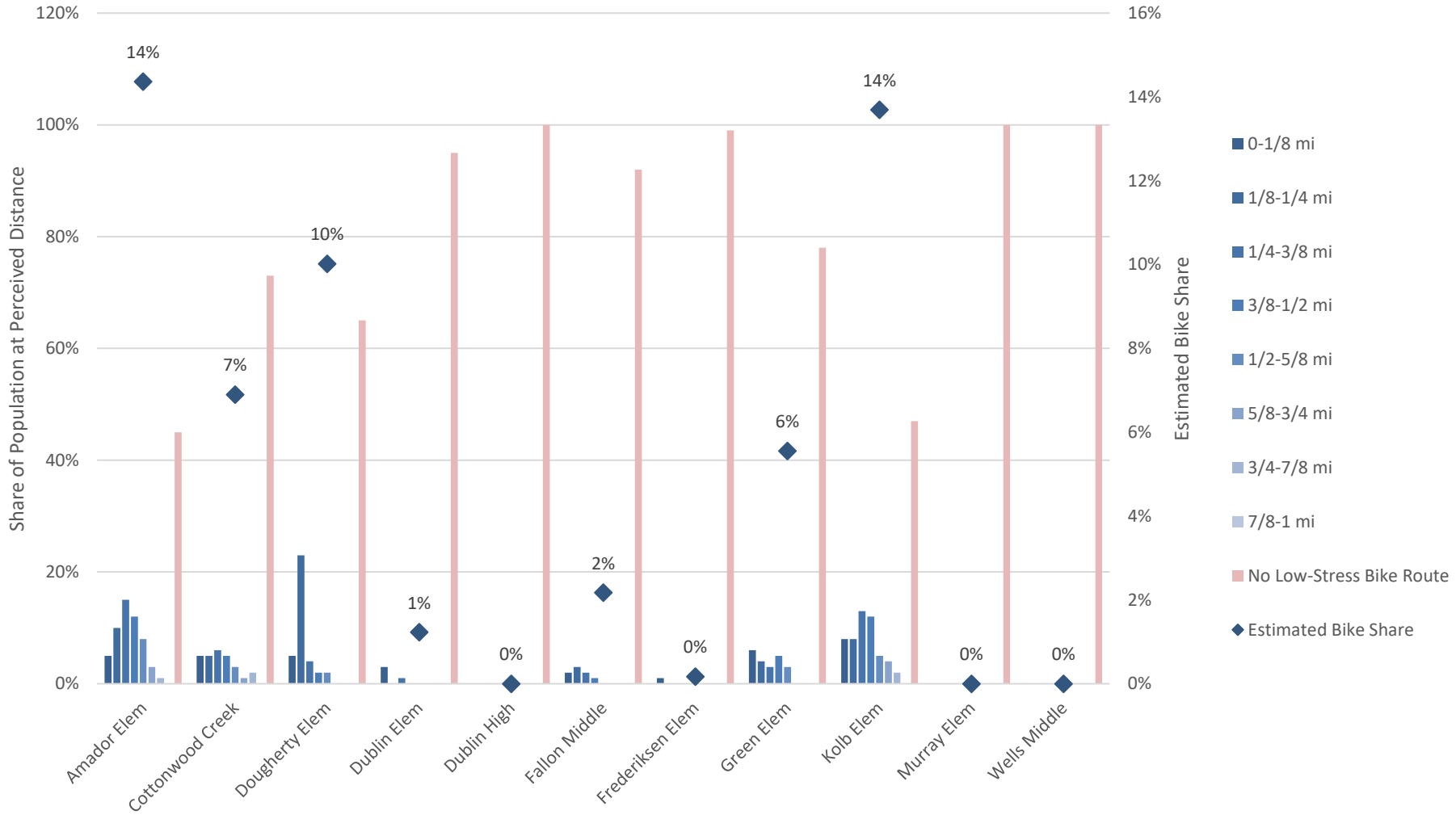


**Figure 2: Share of School Population by Perceived Biking Distance and Estimated Biking Mode Share**



## BART

The estimated walking and biking mode shares are presented in Table 6,which shows an estimated 6 percent biking share and 11 percent walking share. BART mode share was estimated for all Dublin adults (16 and above). Access for each resident is determined by the nearest station (West Dublin/Pleasanton or Dublin/Pleasanton); in other words, the analysis measures perceived distance to *either* station for each resident rather than a specific station. The mode share data used to calibrate estimates are provided in Table 4 and Appendix D.

**Table 6: BART Access by Perceived Distance and Bicyclist Type and Estimated Mode Share**

| Estimate | Share of Population |
|---|---|
| Walking | 11% |
| Biking | |
| *No Way, No How* | *0%* |
| *Interested but Concerned* | *<1%* |
| *Enthused and Confident* | *36%* |
| *Strong and Fearless* | *52%* |
| Total across all Biker Types | 6% |
| Share of Population with Bicycle Route Available[1] | 31% |

[1]This statistic measures the portion of the population who have a bicycle route available based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities but the *Strong and Fearless* population rides on all facilities)

Note: Population for Analysis includes all Dublin adults (43,491)

Source: Prepared by Kittelson & Associates, Inc.

### *Walking*

Walking analysis was conducted separately for the population between 16 and 55 years old and the population above 56 years and older, with walking barriers modeled differently (as explained in Table 3). The perceived distance to the nearest BART station for Dublin residents is presented in Figure 3. The figure demonstrates that the available walking route for most Dublin residents is outside of a conventional half-mile walk shed.

Walking access to BART is mapped in Figures W.B.1 and W.B.2.

### *Biking*

The perceived distance to the nearest BART station for Dublin residents is presented in Figure 4. The figure demonstrates that barriers dissuade the assumed *Interested but Concerned* and *Enthused and Confident* populations from biking to BART. Among the assumed *Strong and Fearless* population, 58 percent are within two miles of a BART station. By contrast, LTS 4 facilities are barriers for *Enthused and Confident* riders, resulting in 72 percent of this population with an available biking route to BART. For *Interested but Concerned* riders who are blocked by LTS 3 and 4 facilities, 1 percent have an available biking route to BART. Improving a few key barriers would improve the availability of bicycle routes for these portions of the Dublin population and unlock latent demand. For example, because both BART stations are south of Dublin Boulevard, people biking need to cross or travel along Dublin Boulevard and other nearby arterial segments.

Biking access to BART is mapped in B.B.1 through B.B.3.

**Figure 3: Share of Population by Perceived Walking Distance to BART**

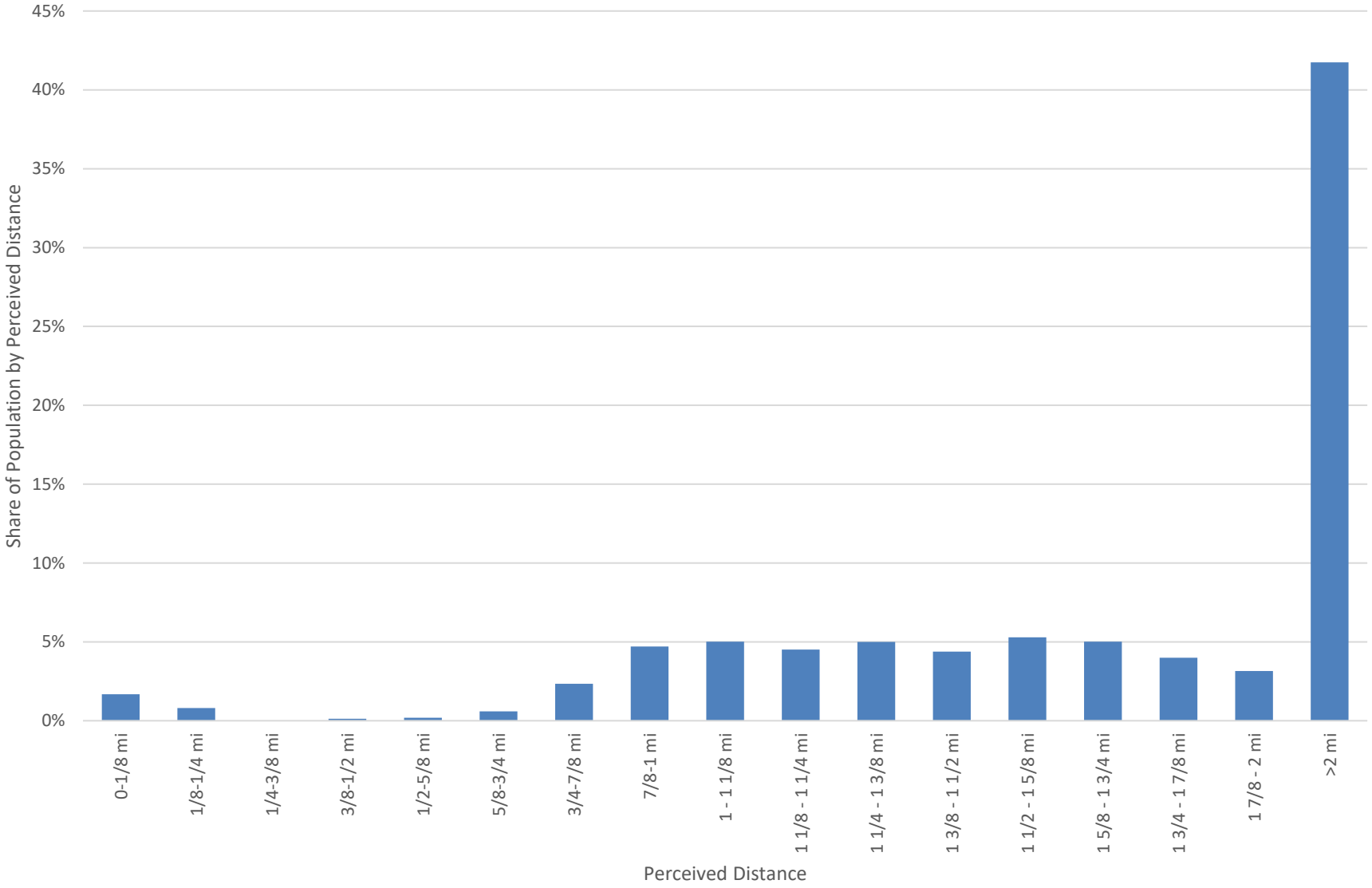
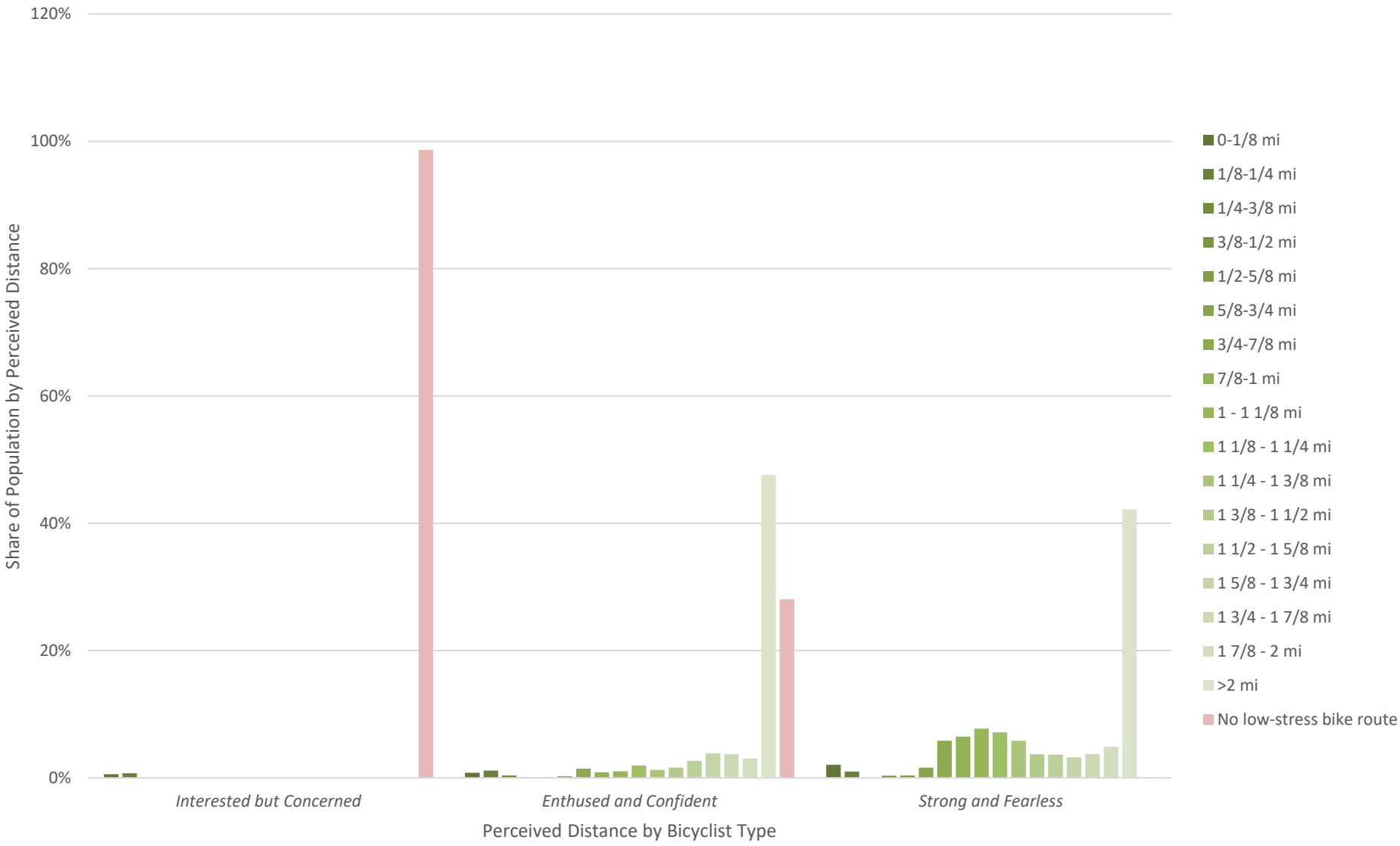


**Figure 4: Share of Population by Perceived Biking Distance to BART**



## Job Centers

Job center mode share estimates are presented for each job center in Table 7. Job center mode share was estimated for all Dublin adults (16 and above). Access to multiple job centers is not a concern for all Dublin residents; each worker typically only commutes to one of these job centers, to another job in Dublin, or to a job outside Dublin. However, access to each job center is analyzed because it is *potentially relevant* for each Dublin resident or worker (whereas access to job centers in aggregate would not be relevant to any resident or worker). The mode share data used to calibrate estimates are provided Table 4 and are substantiated by citywide commute mode shares based on ACS data as discussed in the June 22 Demographic Analysis memorandum. A map excerpt from that memorandum is shared in Appendix E. The job centers are identified A through G, with each representing the following employers (based on data provided by the City's Economic Development Department):

- **Job Center A:** Dublin Blvd & Fallon Rd (Target, Kaiser Permanente, and others)
- **Job Center B:** Dublin Blvd & Dougherty Rd (NCM Demolition and Remediation, North Star Group, Park West, Gold Metal Press, Touch Place, and others)
- **Job Center C:** Dublin Corporate Center (Dublin Blvd & Tassajara Rd)
- **Job Center D:** Gleason Dr/Central Pkwy at Arnold Dr (Ross, Carl Zeiss Meditec, DTI Dental Technologies)
- **Job Center E:** Dublin Blvd & San Ramon Rd (DeSilva Gates, Hexcel Corporation, Challenge Dairy HQ, Graybar Electric, 580 Executive Center)
- **Job Center F:** Central Pkwy/Dublin Blvd at Arnold Dr (AEye, Patelco Credit Union, TriNet, Alameda County Sheriff's Office, Zeiss Innovation Center)
- **Job Center G:** Hacienda Crossings

The walking share estimates range between 4 and 9 percent per job center, and the bike share estimates range from between 1 and 3 percent. The variability among job centers can be attributed to their locations relative to residential locations within Dublin and the infrastructure immediately surrounding them. For example, Job Center E is located in the western portion of Dublin away from the bulk of residential locations and is accessible via Dublin Boulevard, which includes portions with LTS scores of 3 or 4. The portion of Dublin residents with a low-stress bicycle route available varies between 16 percent (Job Center E) and 37 percent (Job Center B).[4]

The perceived walking and biking distances for each job center are provided in Figure 5 and Figure 6. Walking access and routes to job centers are presented in Figures W.J.1 through W.J.16. Biking access and routes to job centers are presented in B.J.1 through B.J.7.

[4] "Bicycle route available" indicates that a feasible route exists between origin and destination based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities)

**Table 7: Mode Share Estimates by Job Center**

| School | Walking | Biking | Share of population with bicycle route available[1] |
|---|---|---|---|
| Job Center A: Dublin Blvd & Fallon Rd (Target, Kaiser Permanente, and others) | 8% | 2% | 18% |
| Job Center B: Dublin Blvd & Dougherty Rd (NCM Demolition and Remediation, North Star Group, Park West, Gold Metal Press, Touch Place, and others) | 8% | 3% | 37% |
| Job Center C: Dublin Corporate Center (Dublin Blvd & Tassajara Rd) | 6% | 2% | 20% |
| Job Center D: Gleason Dr/Central Pkwy at Arnold Dr (Ross, Carl Zeiss Meditec, DTI Dental Technologies) | 9% | 3% | 32% |
| Job Center E: Dublin Blvd & San Ramon Rd (DeSilva Gates, Hexcel Corporation, Challenge Dairy HQ, Graybar Electric, 580 Executive Center) | 4% | 1% | 16% |
| Job Center F: Central Pkwy/Dublin Blvd at Arnold Dr (AEye, Patelco Credit Union, TriNet, Alameda County Sheriff's Office, Zeiss Innovation Center) | 9% | 2% | 20% |
| Job Center G: Hacienda Crossings | 9% | 2% | 19% |

[1]This statistic measures the portion of the population who have a bicycle route available based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities but the *Strong and Fearless* population rides on all facilities)

Note: Population for analysis includes all Dublin adults (43,491)

Source: Prepared by Kittelson & Associates, Inc.

**Figure 5: Share of Population by Perceived Walking Distance to Job Centers**

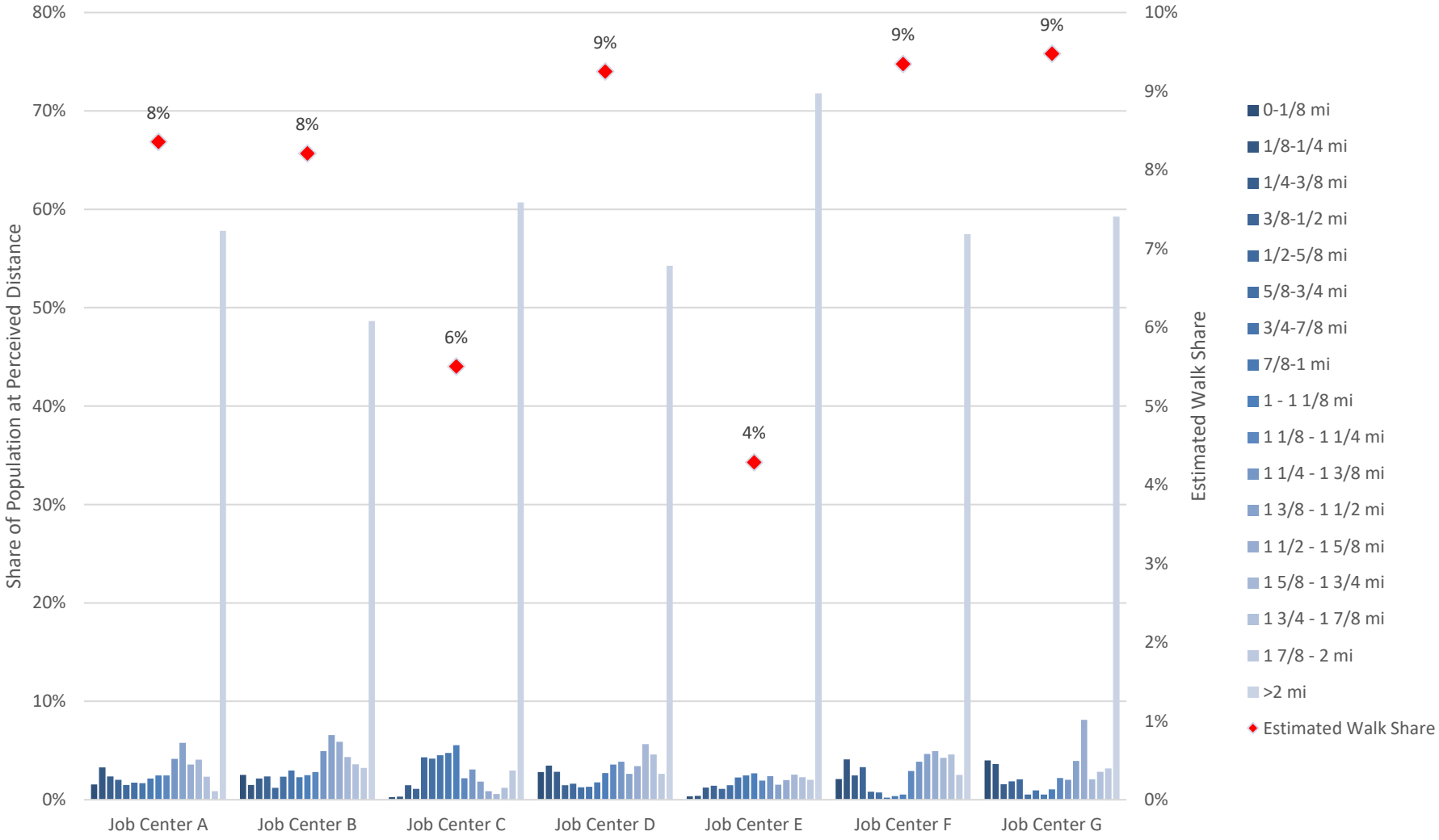
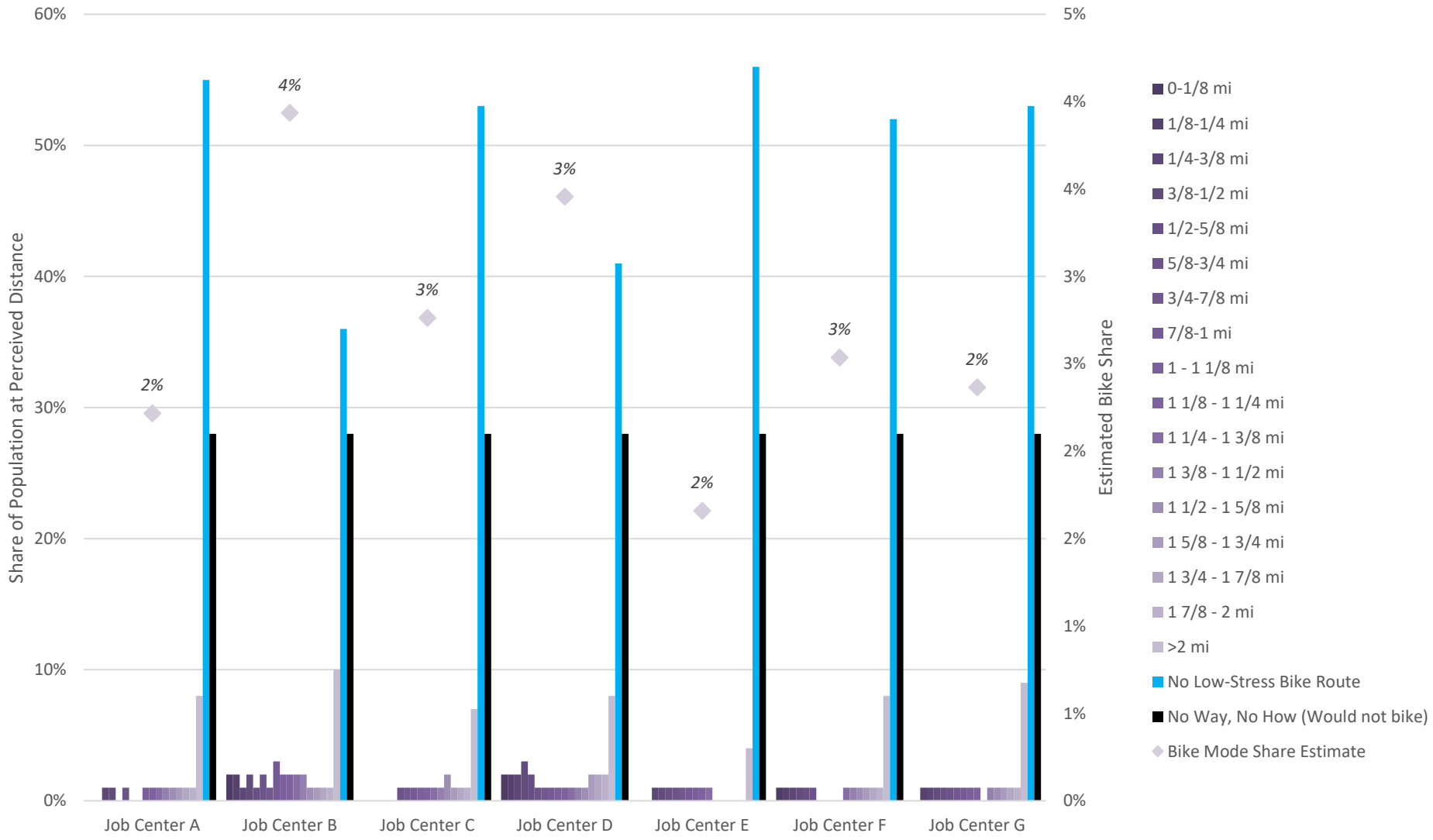


**Figure 6: Share of Population by Perceived Biking Distance to Job Centers**



## Parks

Park access and mode share estimates were conducted for all Dublin residents. Access for each resident is determined by the nearest City park; in other words, the analysis measures perceived distance to *any* park for each resident rather than for a specific one. The mode share data used to calibrate estimates are provided in Table 4 and Appendix D. The estimated walking and biking mode shares are presented in Table 8, which shows an estimated 3 percent biking share and 62 percent walking share. As the results indicate, the ubiquity of parks provides a relatively close park to most Dublin residents. However, low-stress bicycle routes are not abundant which prevents some residents from having an appropriately low-stress bicycle route to their nearest park.

The perceived walking and biking distances by population are presented in Figure 7 and Figure 8, respectively. The comparative perceived distances illustrate the difference in available walking routes compared to available low-stress bicycle routes.

**Table 8:Park Mode Share Estimates**

| Estimate | Share of Population |
|---|---|
| Walking | 62% |
| Biking | 3% |
| Share of Population with Bicycle Route Available[1] | 42% |

[1]This statistic measures the portion of the population who have a bicycle route available based on LTS rules (e.g., the *Interested but Concerned* population only rides on LTS 1 or 2 facilities but the *Strong and Fearless* population rides on all facilities)

Note: Population for Analysis includes all Dublin residents (59, 274)

Source: Prepared by Kittelson & Associates, Inc.

Walking access to parks is mapped in Figures W.P.1 and W.P.2. Biking access to parks is mapped in B.P.1 through B.P.3.

**Figure 7: Share of Population by Perceived Walking Distance to Nearest Park**

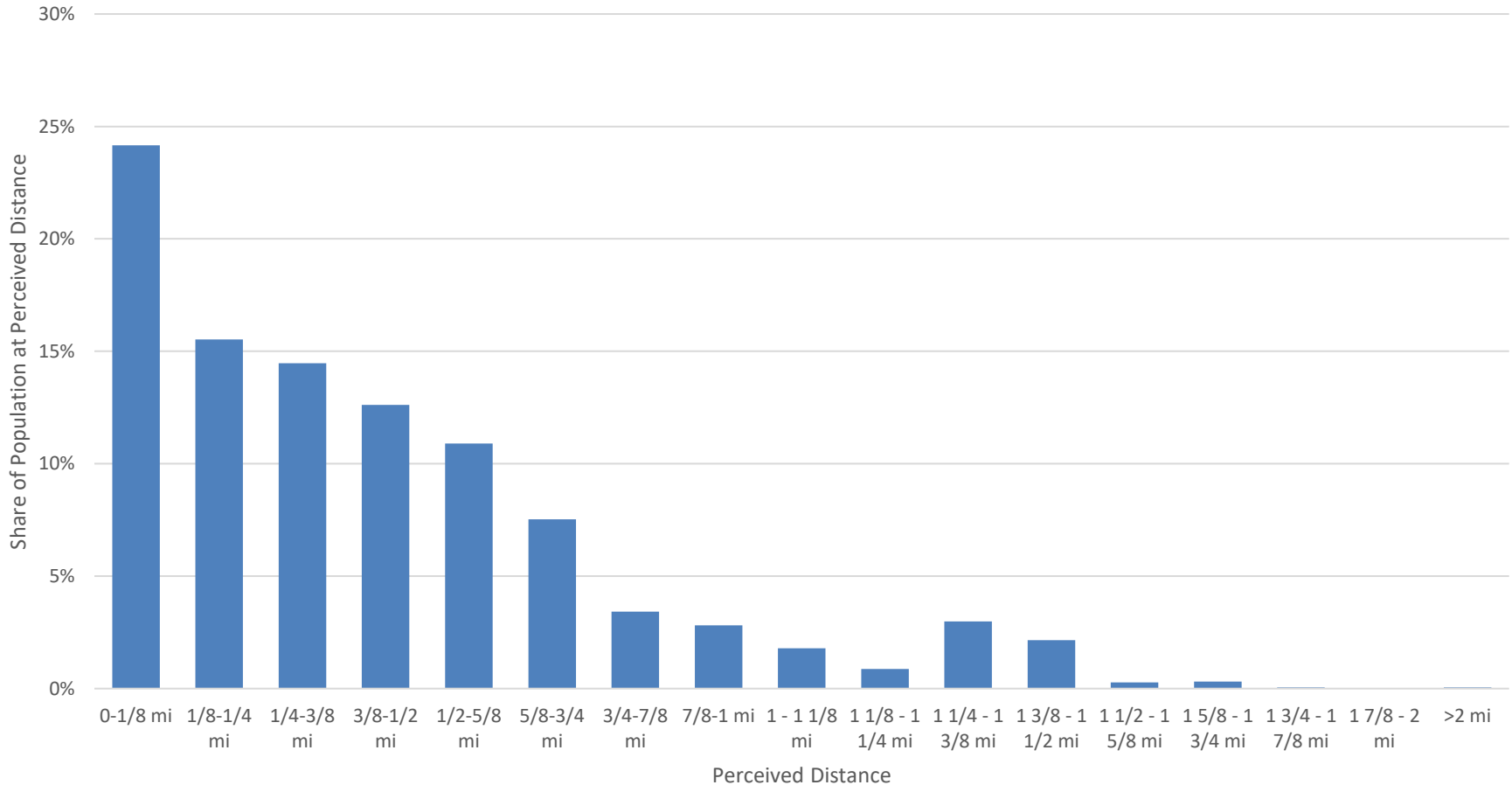
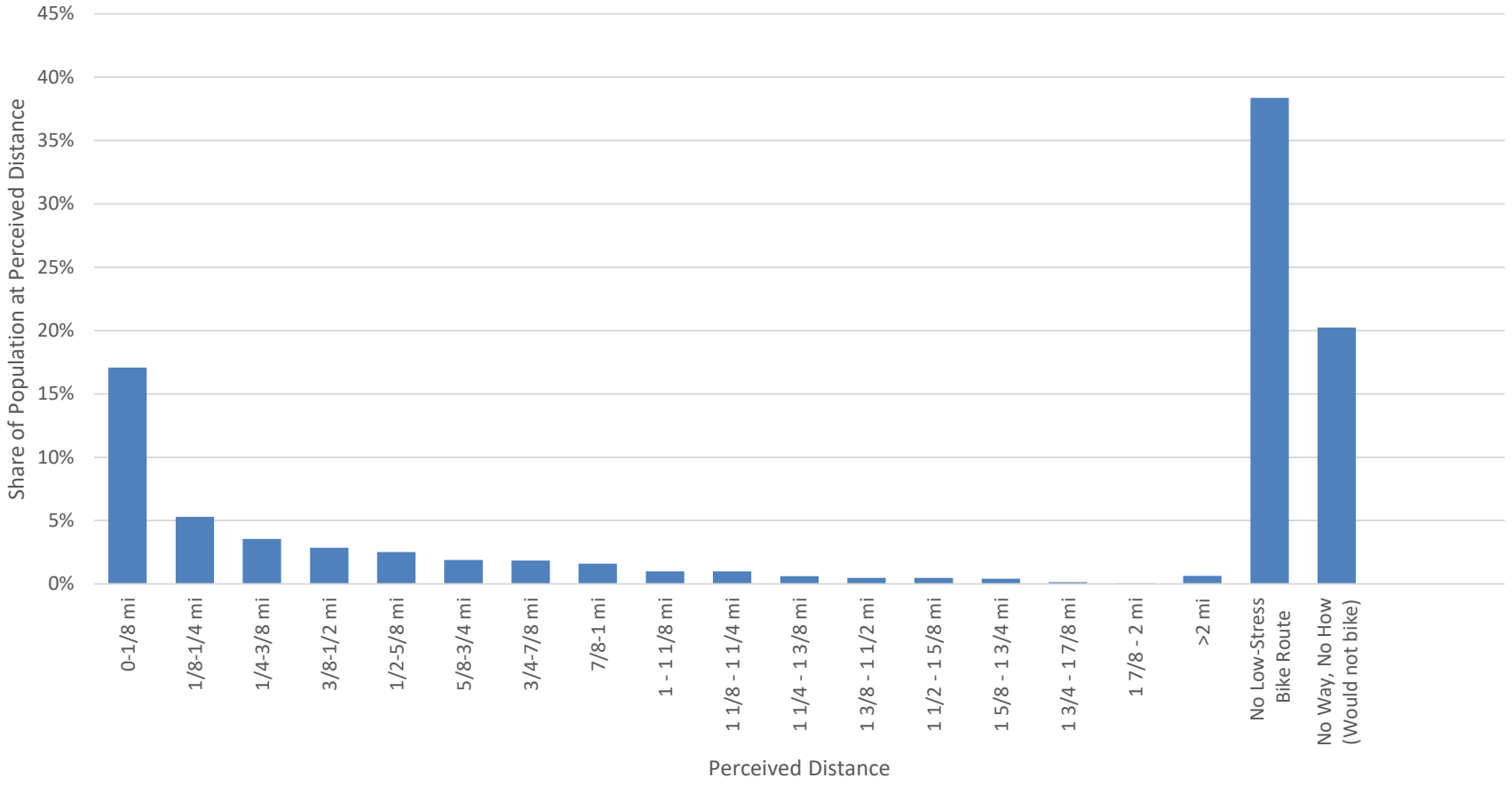


**Figure 8: Share of Population by Perceived Biking Distance to Nearest Park**



# MAP FIGURES

## Schools

**Walking: Figures W.S.1-W.S.11 -** Each figure illustrates the relevant walking typology group for each school

**Biking: Figures W.B. 1-W.S.11 -** Each figure illustrates the relevant walking typology group for each school

## BART

**Walking: Figures W.B.1-W.B.2** -- Each figure illustrates access for one walking age typology group.

**Biking: Figures B.B.1-B.B.2** -- Each figure illustrates access for one biking typology group. The *No way, no how* group is not shown, given that they are assumed not to bike.

## Job Centers

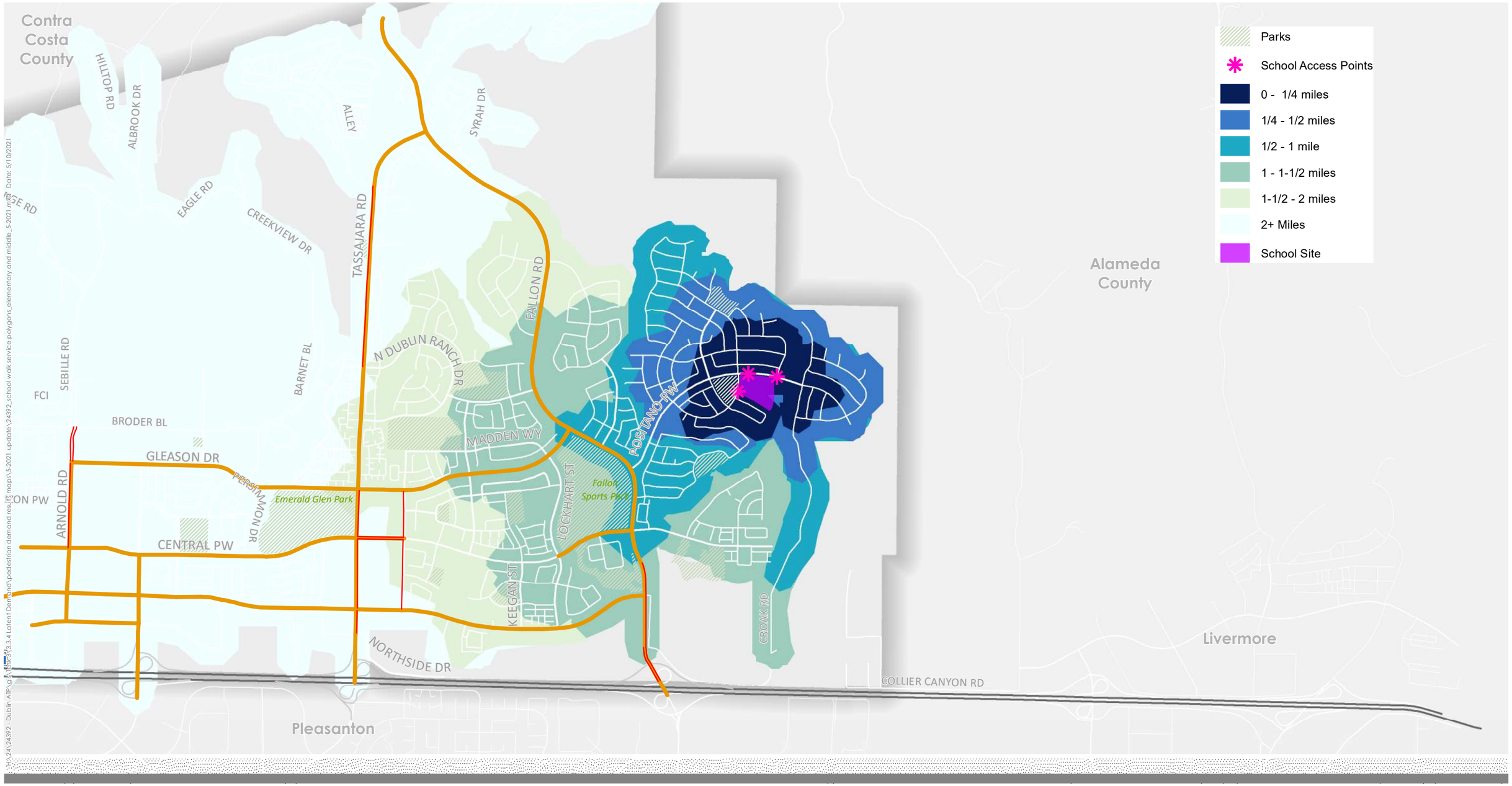
**Walking: Figures W.J.1-W.J.16** -- Each figure illustrates access for one walking age typology groups and one job center. Figures 1 and 2 illustrate Job Center A, 3 and 4 illustrate Job Center B, and so forth.

**Biking: Figures B.J.1-B.B.7** -- Each figure illustrates access for one biking typology group and one job center. Figures B.J.1a through B.J.1c illustrate Job Center A, B.J.2a through B.J.2c illustrate Job Center B, and so forth.

## Parks

**Walking: Figures W.P.1-W.P.2** -- Each figure illustrates access for one walking age typology group.

**Biking: Figures B.P.1-B.P.3** -- Each figure illustrates access for one biking typology group. The *No way, no how* group is not shown, given that they are assumed not to bike.




DUBLIN CALIFORNIA

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Figure W.S.1

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Amador Elem**
**Dublin, California**

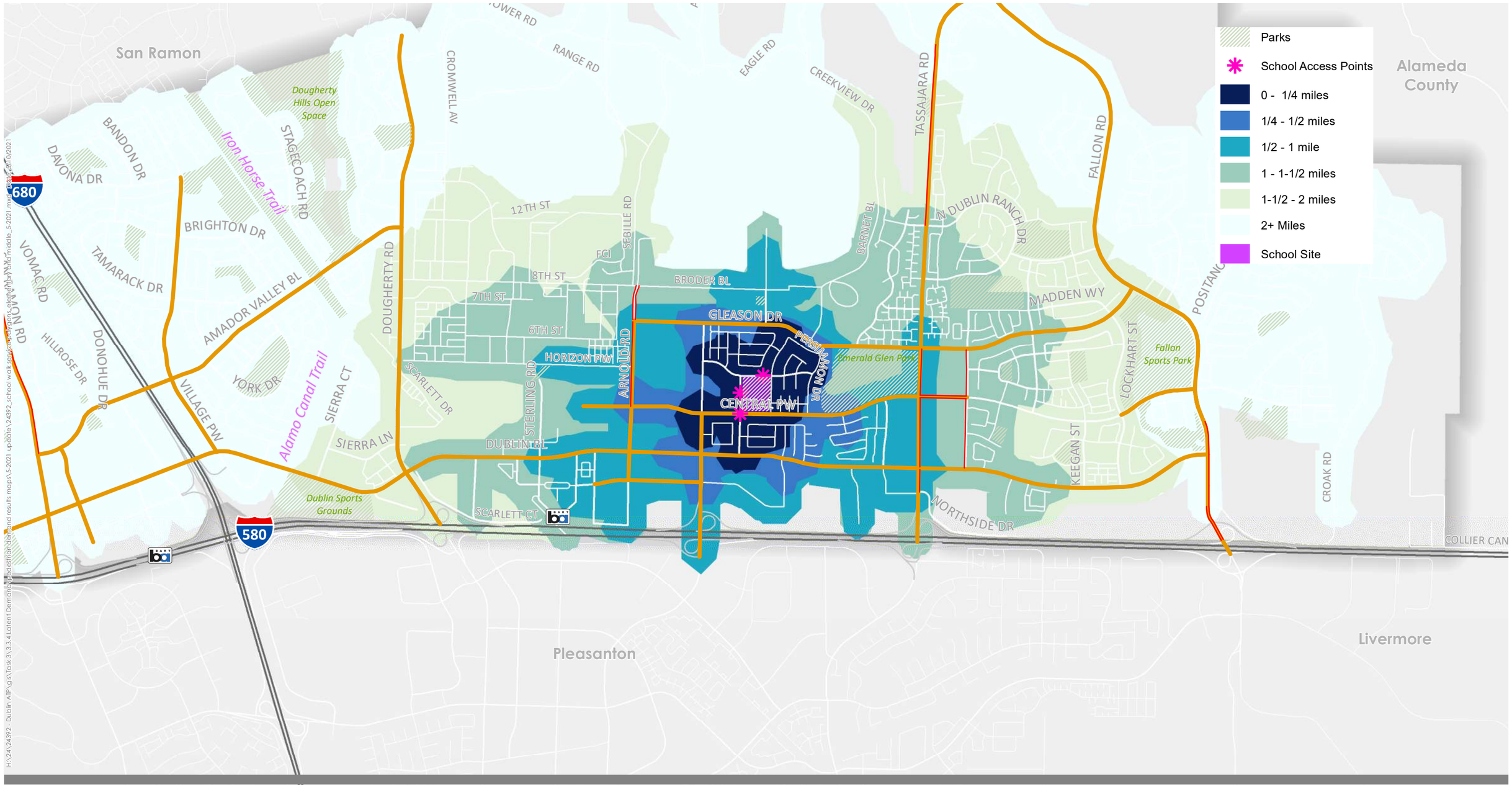



DUBLIN
CALIFORNIA

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Figure W.S.2

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Cottonwood Creek**
**Dublin, California**



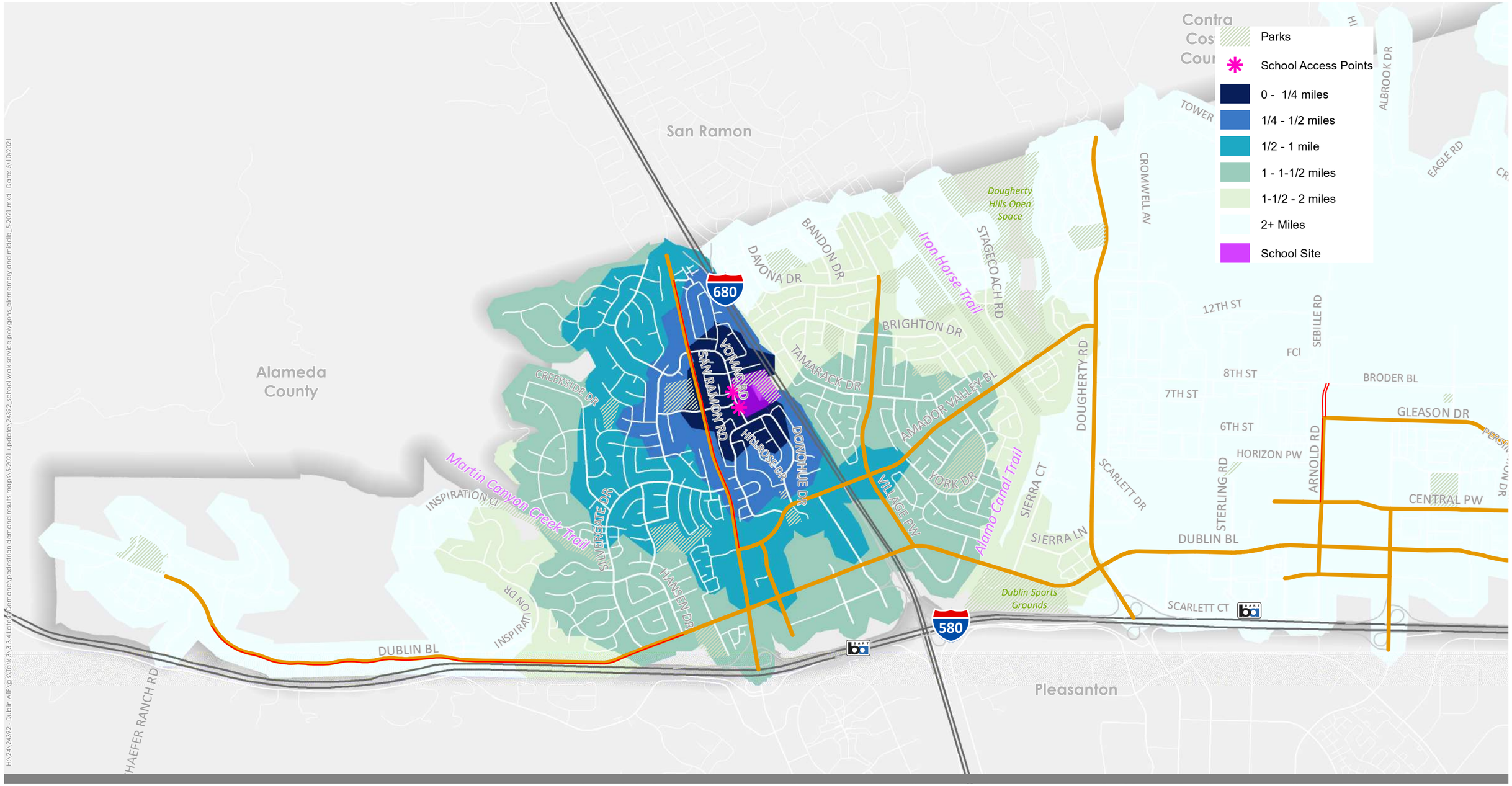

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DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Figure W.S.3

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Dougherty Elem**
**Dublin, California**



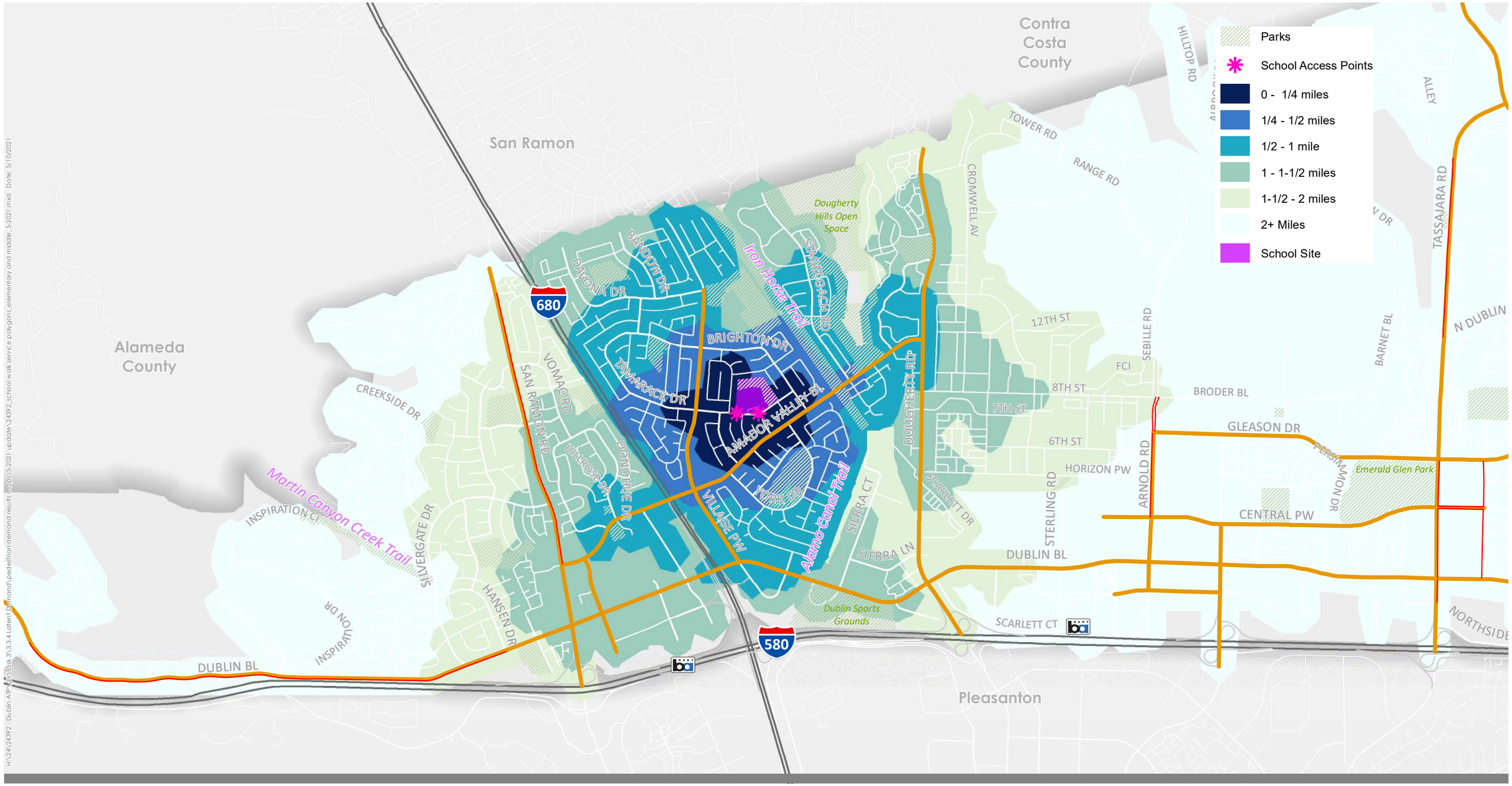

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DUBLIN
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Figure W.S.4

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Dublin Elem**
**Dublin, California**

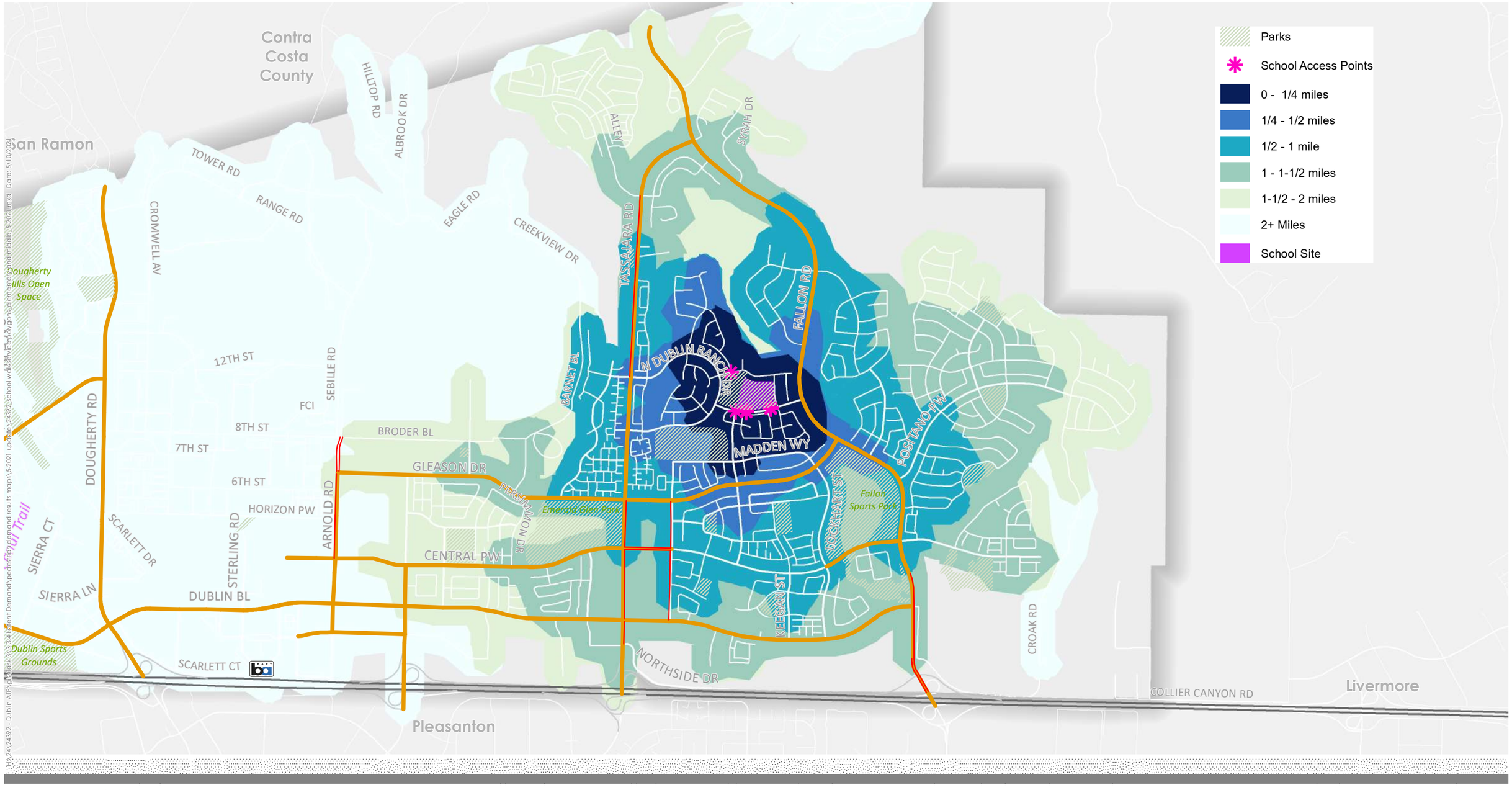



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Figure W.S.5

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Frederiksen Elem**
**Dublin, California**




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Figure W.S.6

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Green Elem**
**Dublin, California**

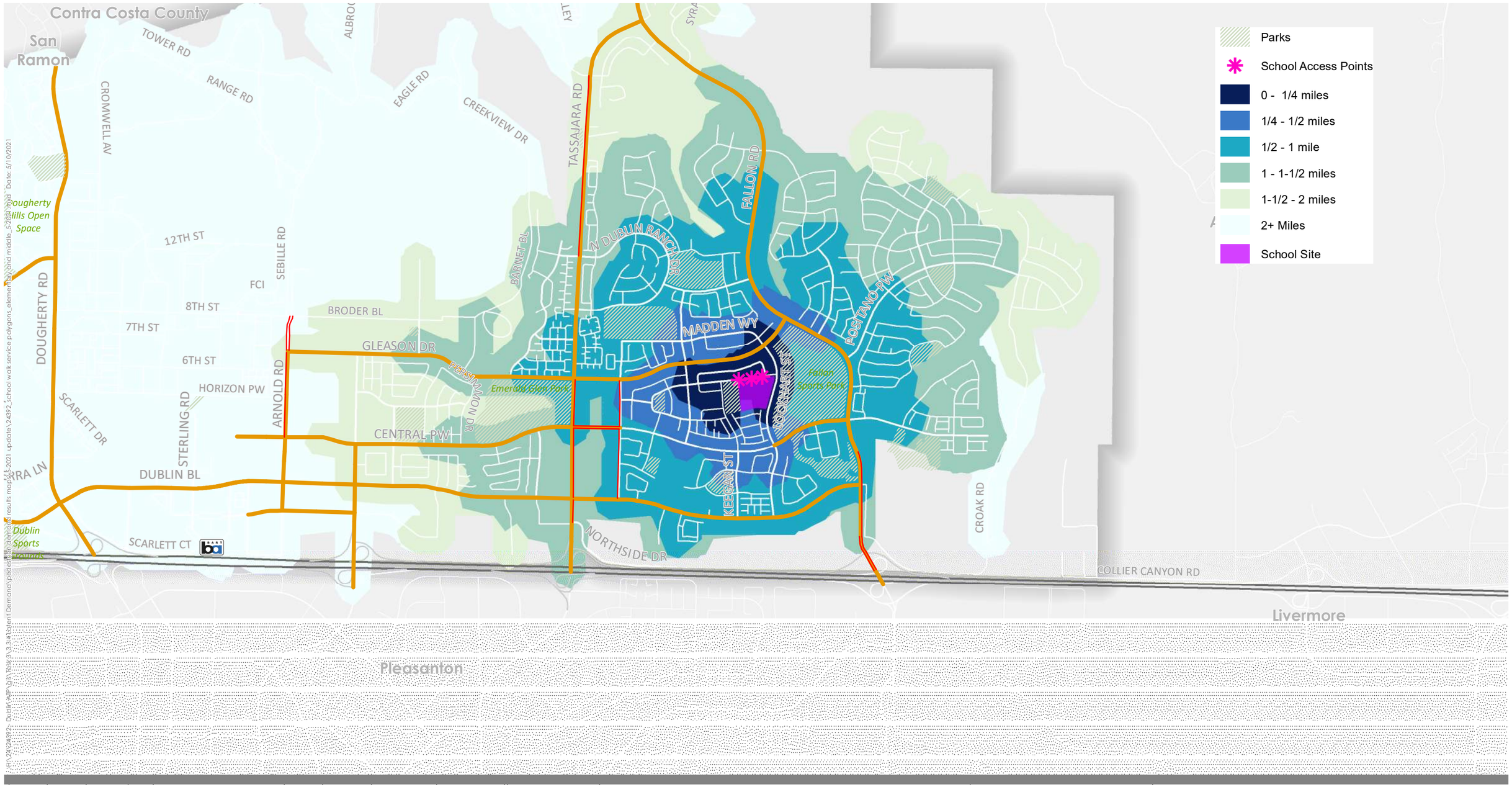
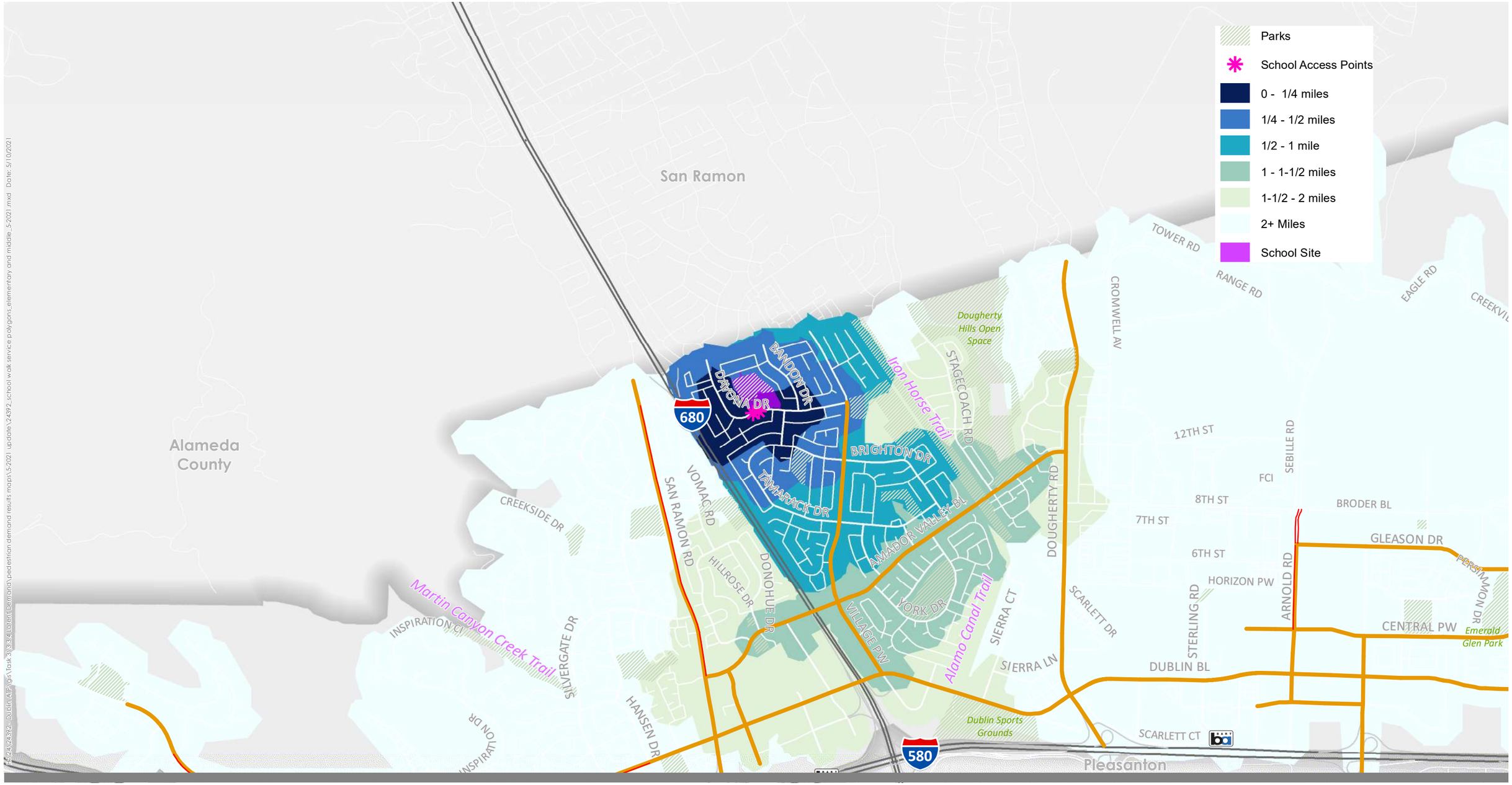



Figure W.S.7

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Kolb Elem**
**Dublin, California**

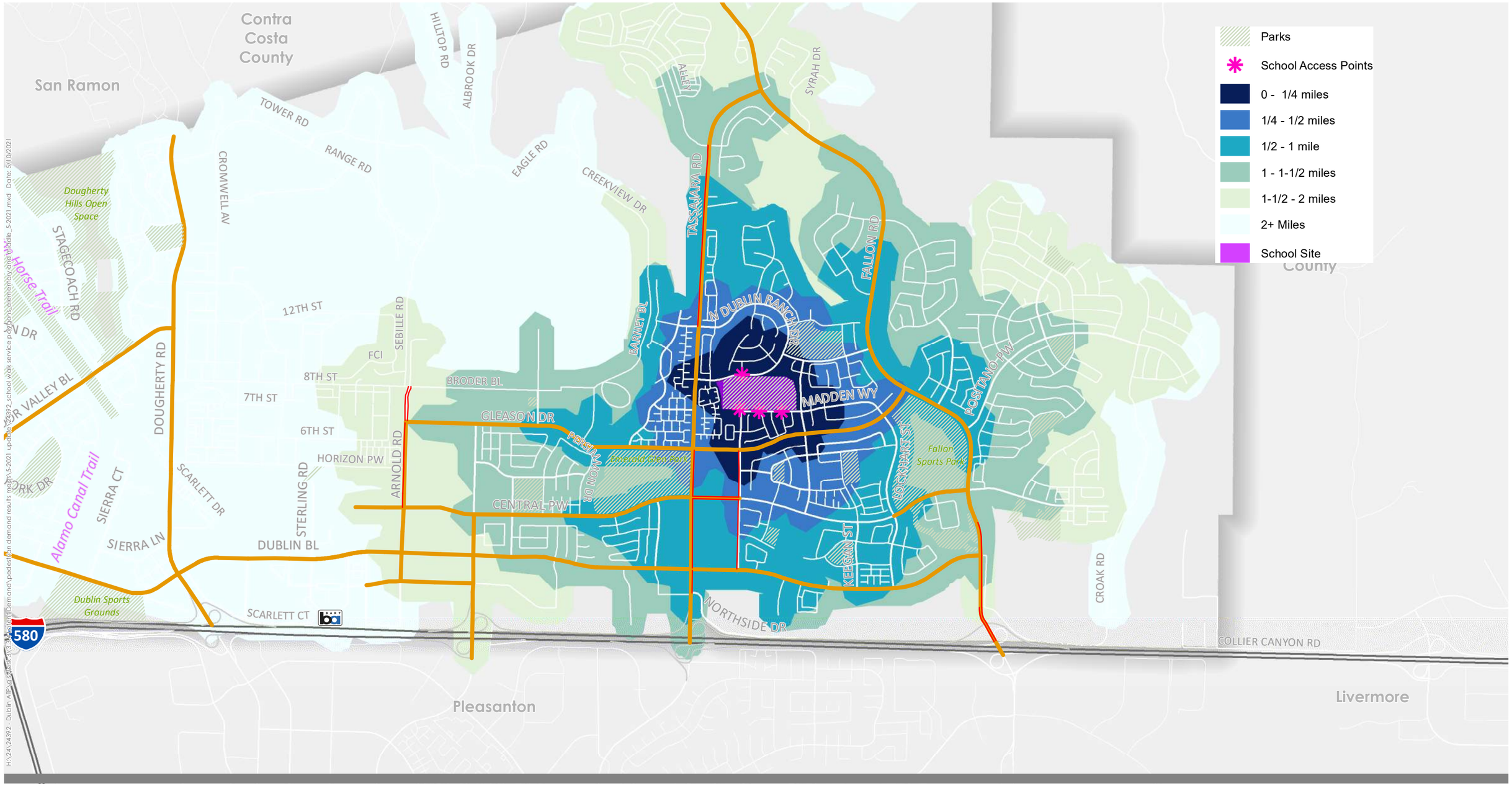



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Figure W.S.8

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Murray Elem**
**Dublin, California**

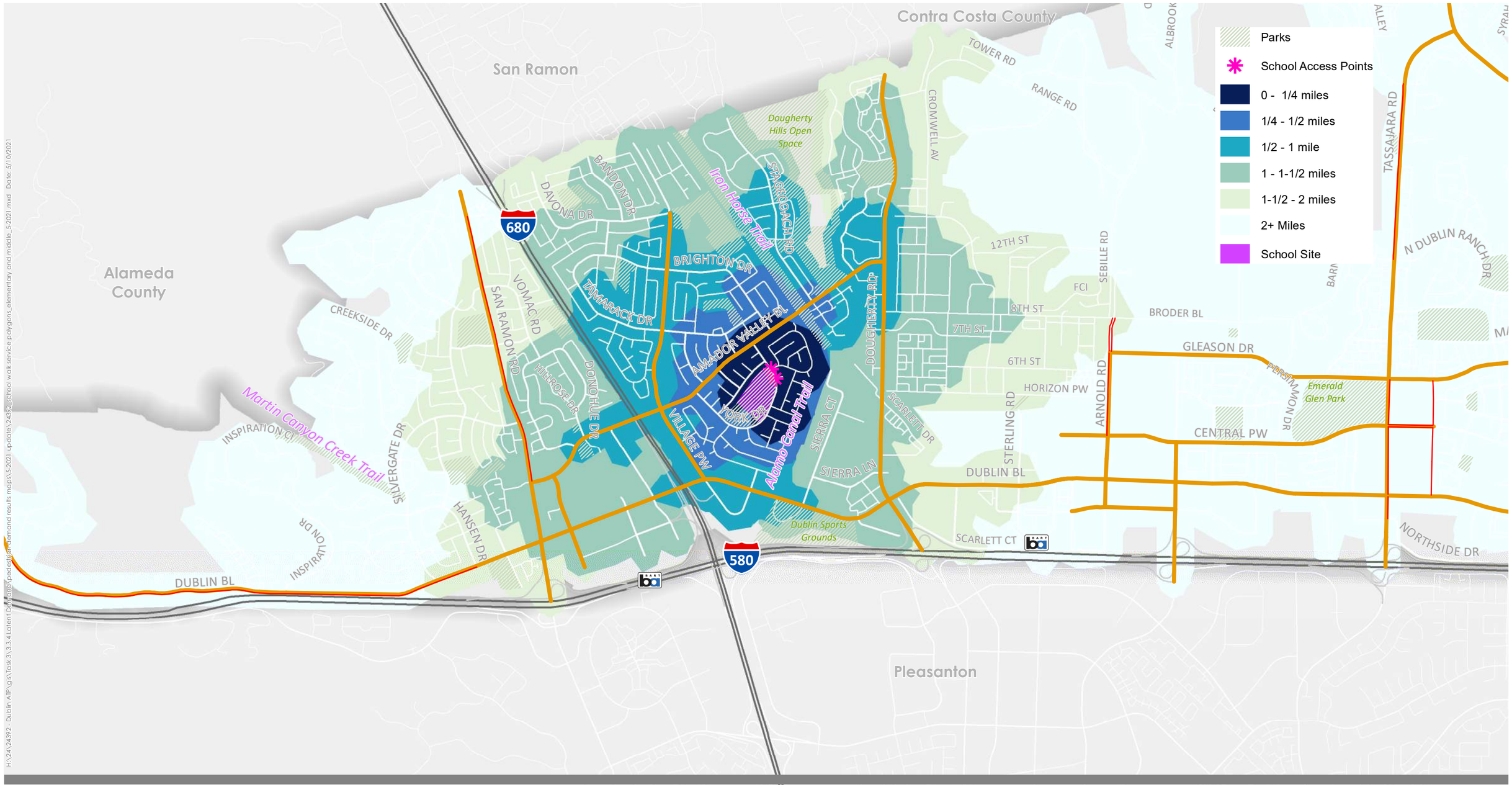



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Figure W.S.9

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Fallon Middle**
**Dublin, California**



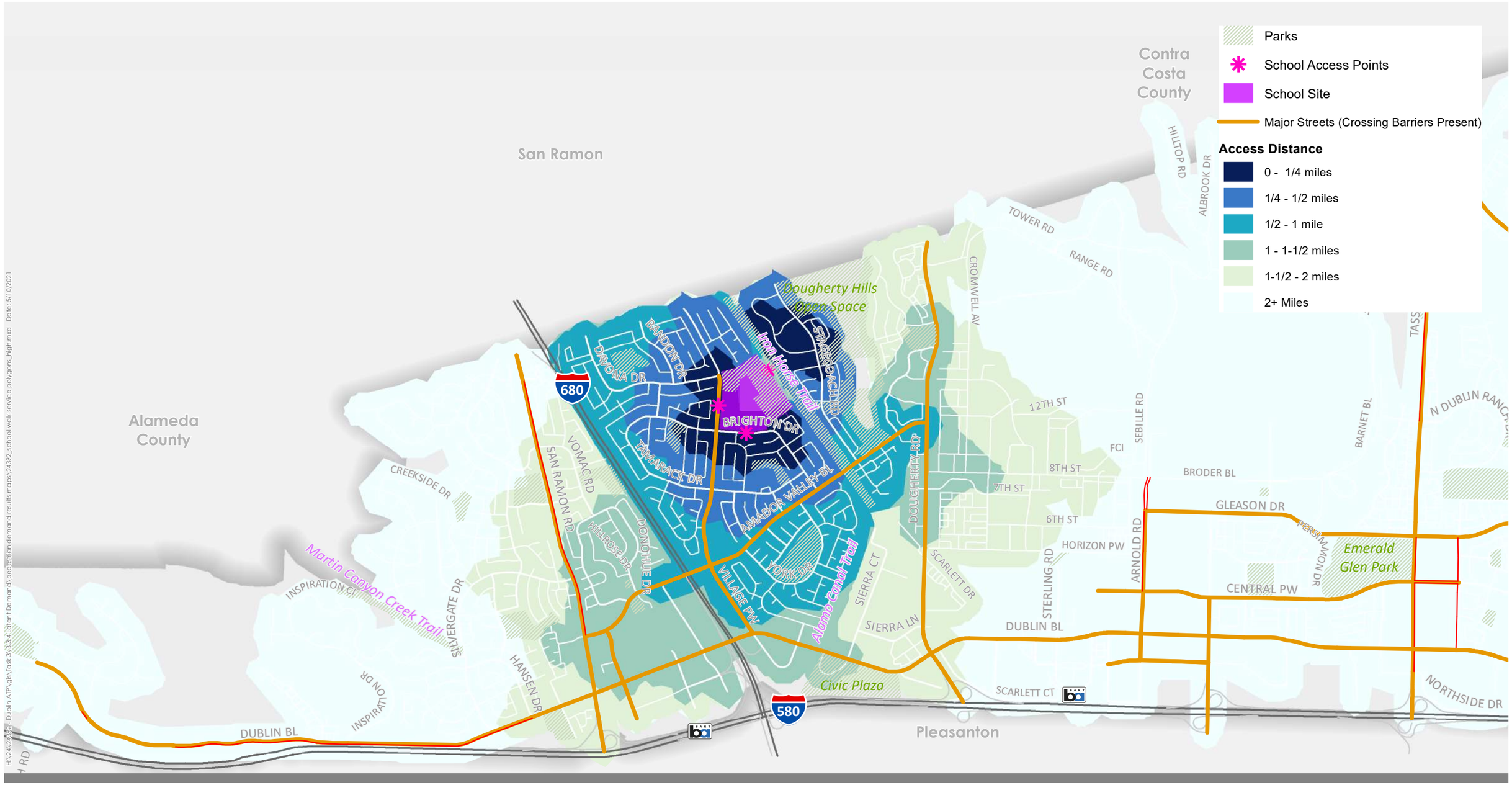

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Figure W.S.10

**Elementary And Middle School Network Service Areas: Walking Perceived Distances**
**Wells Middle**
**Dublin, California**



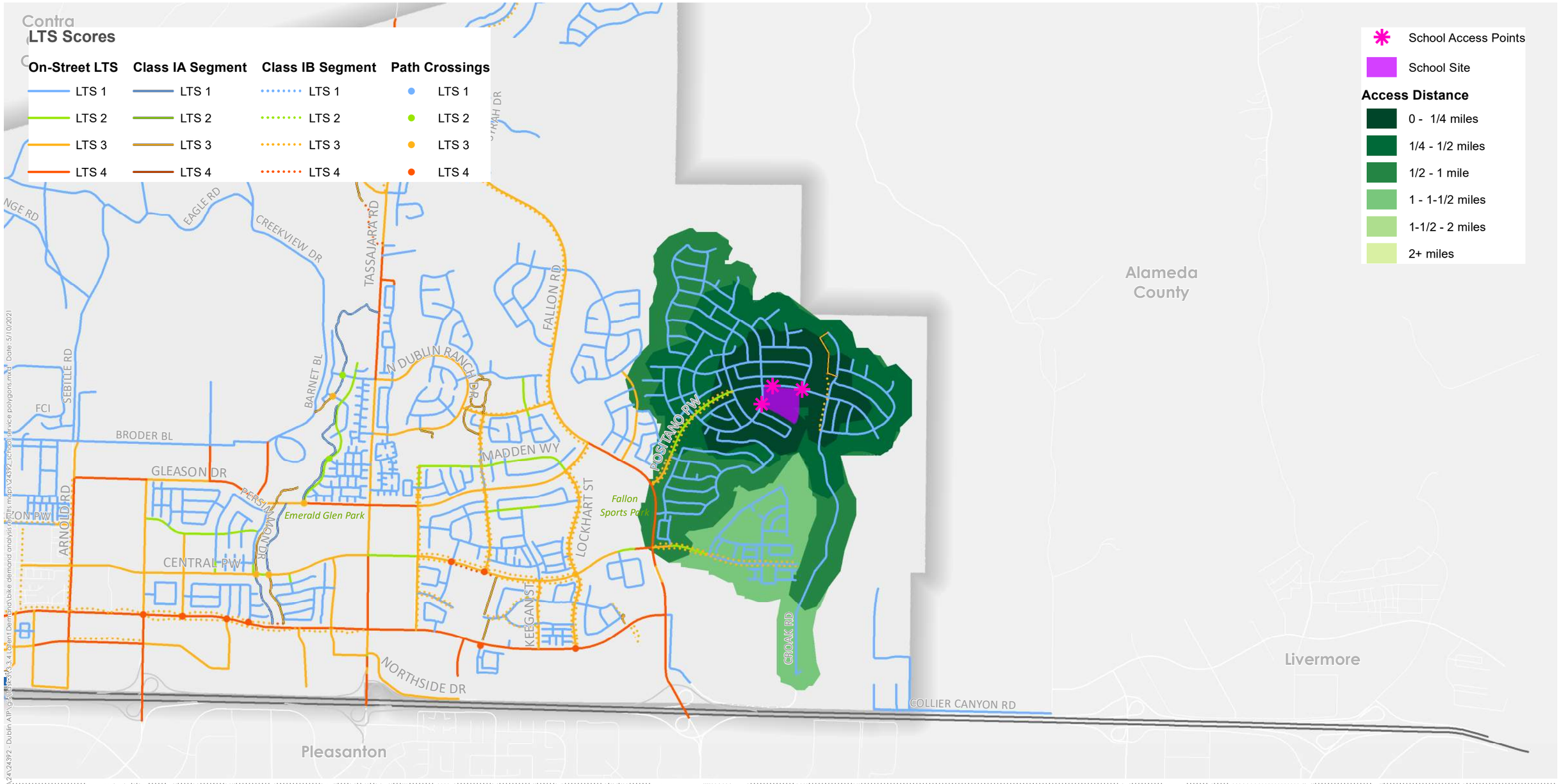

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Figure W.S.11

**High School Network Service Areas: Walking Perceived Distances**
**Dublin High**
**Dublin, California**

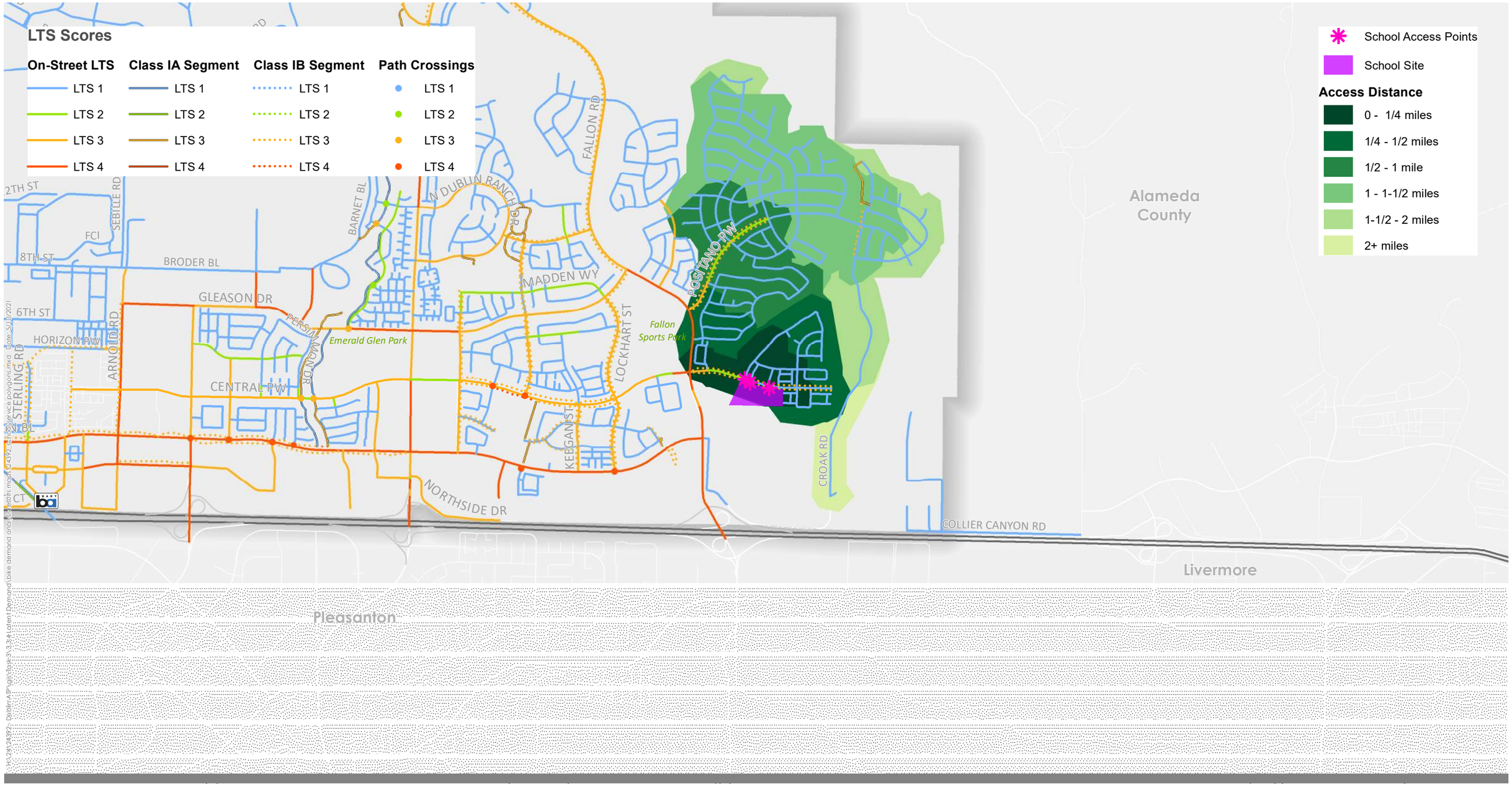



DUBLIN
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Figure B.S.1

**Amador Elem**
**Network Service Area**
**Dublin, California**



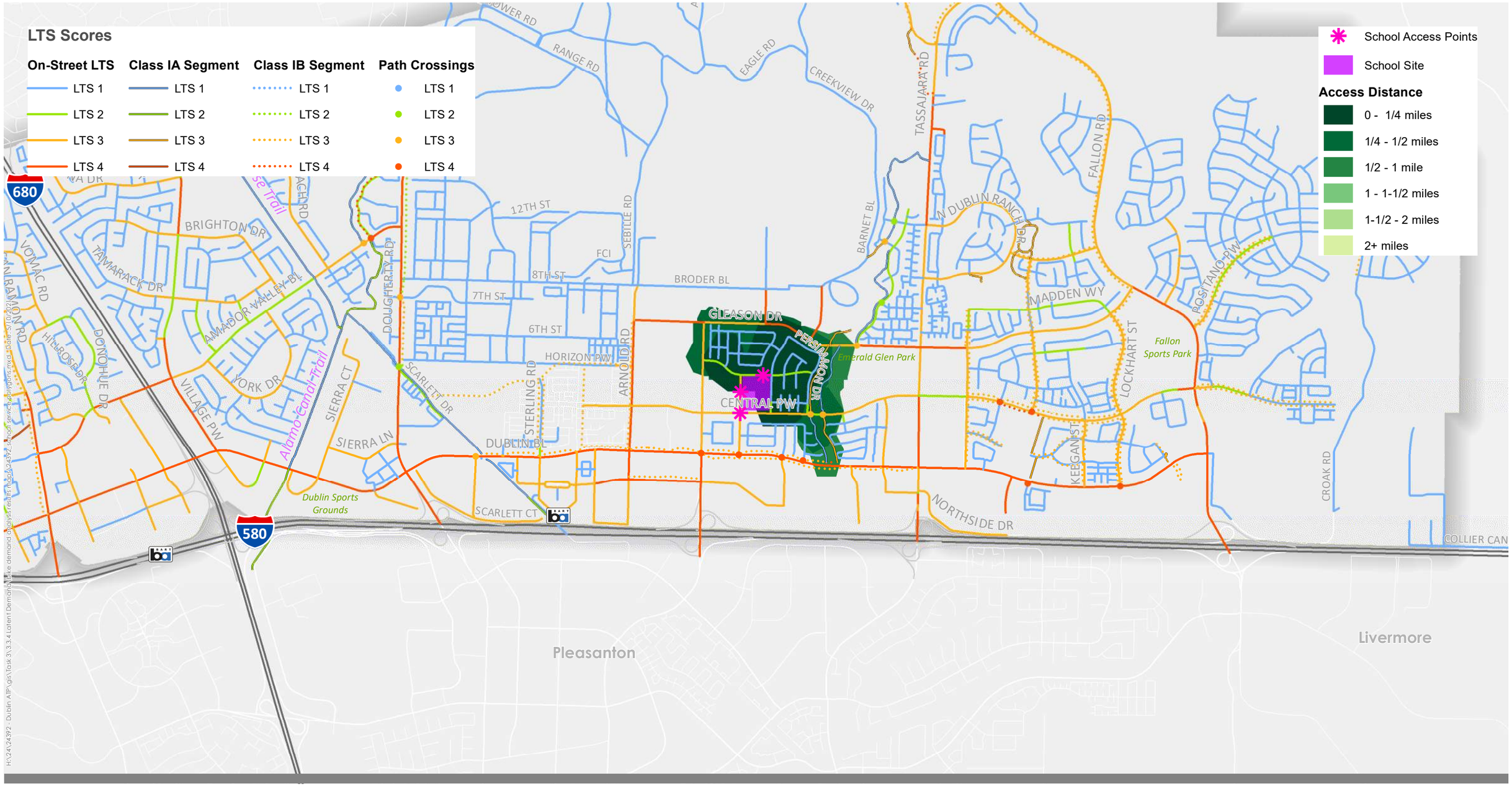

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DUBLIN
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Figure B.S.2

**Cottonwood Creek Network Service Area Dublin, California**

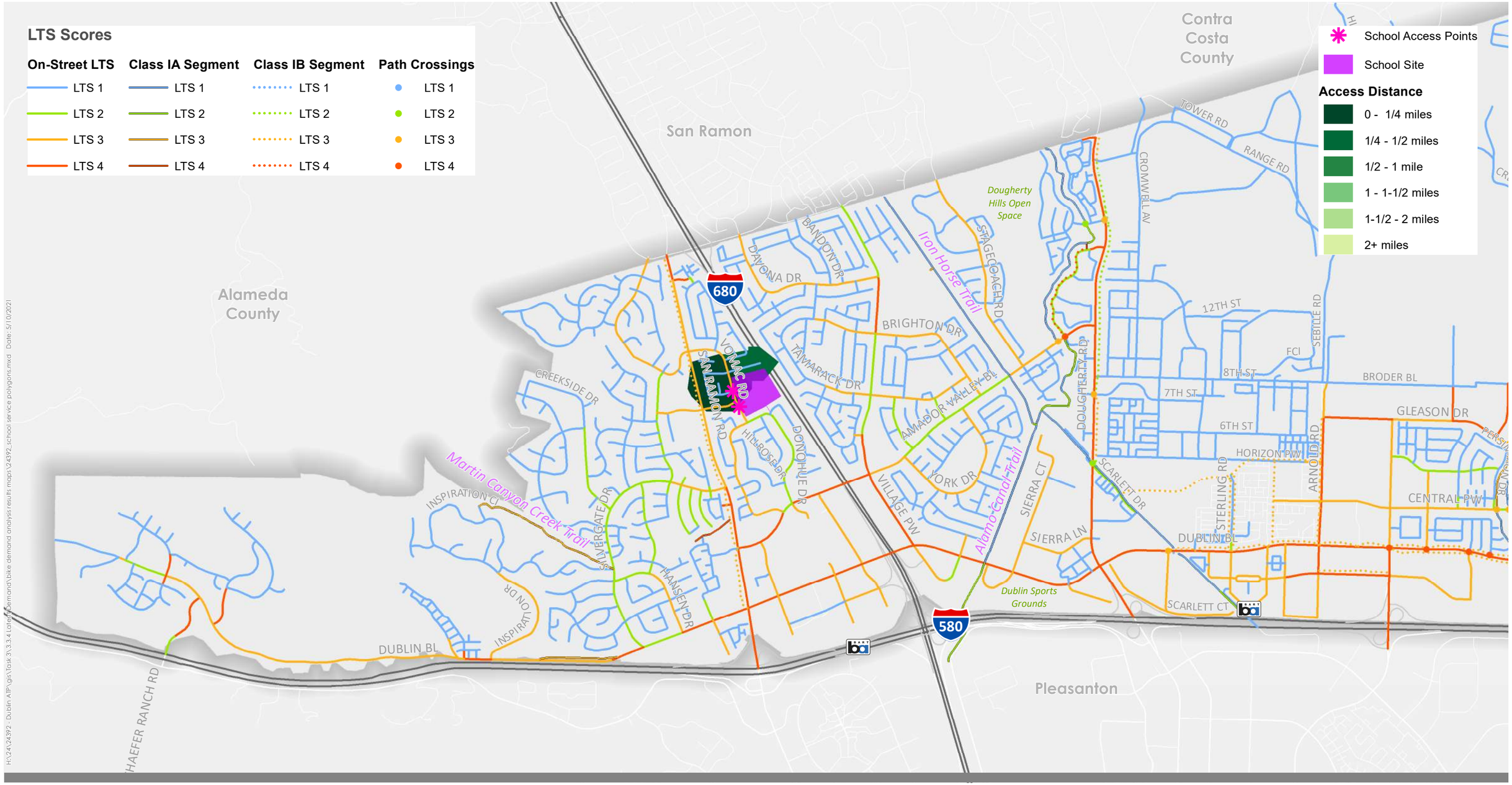



DUBLIN CALIFORNIA

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Figure B.S.3

**Dougherty Elem Network Service Area Dublin, California**

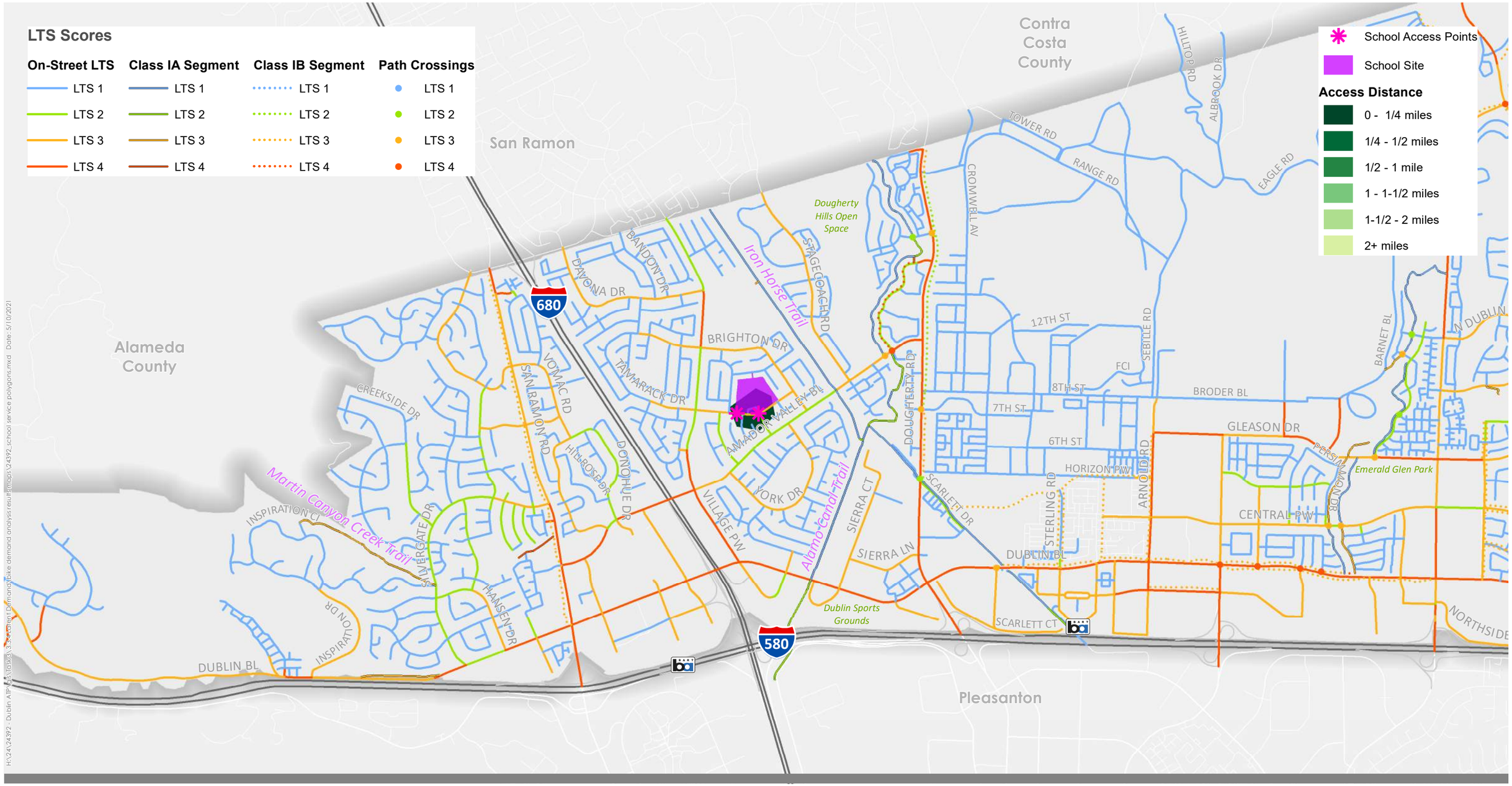



DUBLIN
CALIFORNIA

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Figure B.S.4

**Dublin Elem**
**Network Service Area**
**Dublin, California**



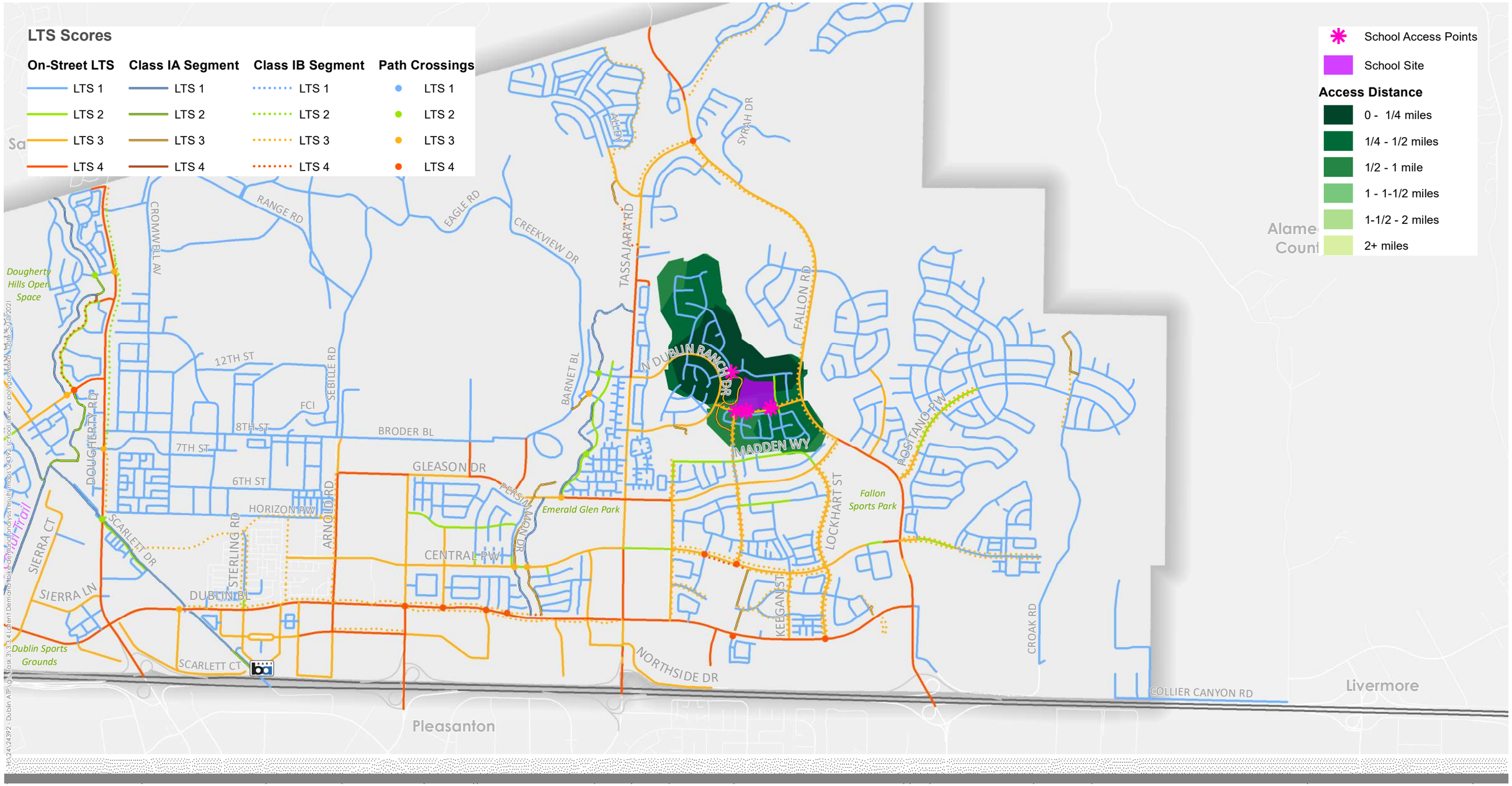

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Figure B.S.5

**Frederiksen Elem**
**Network Service Area**
**Dublin, California**

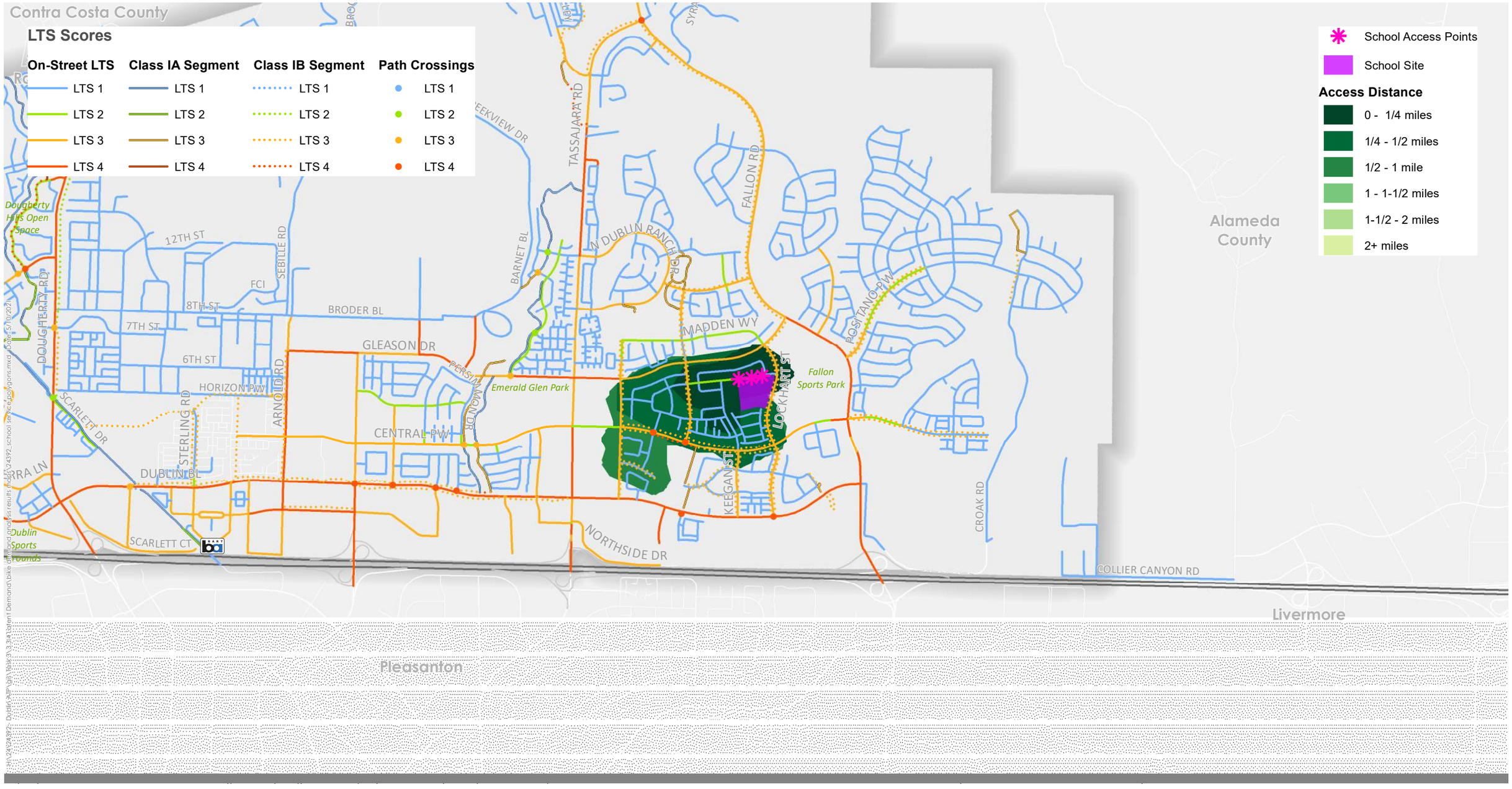



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Figure B.S.6

**Green Elem**
**Network Service Area**
**Dublin, California**

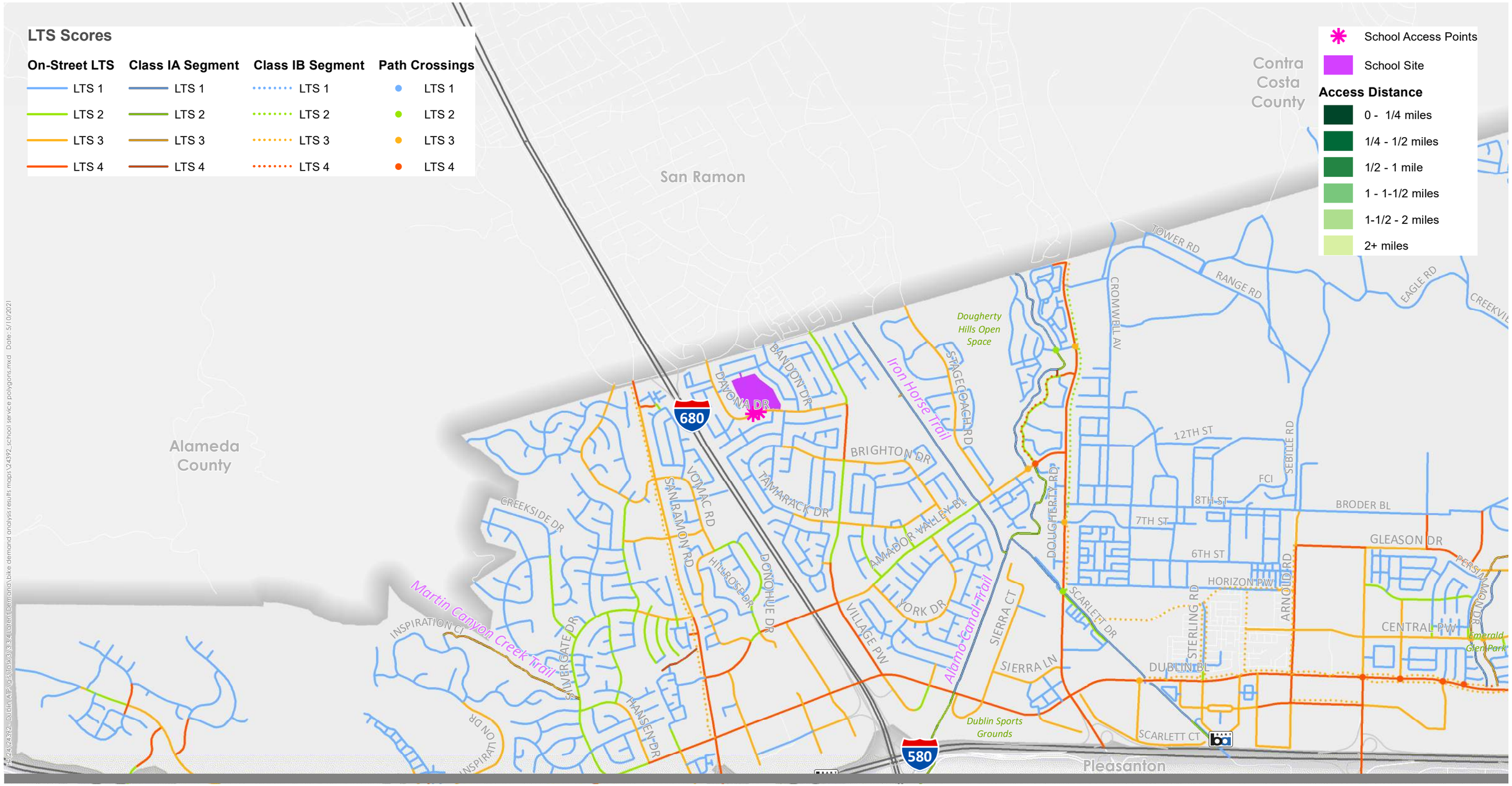



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Figure B.S.7

**Kolb Elem**
**Network Service Area**
**Dublin, California**



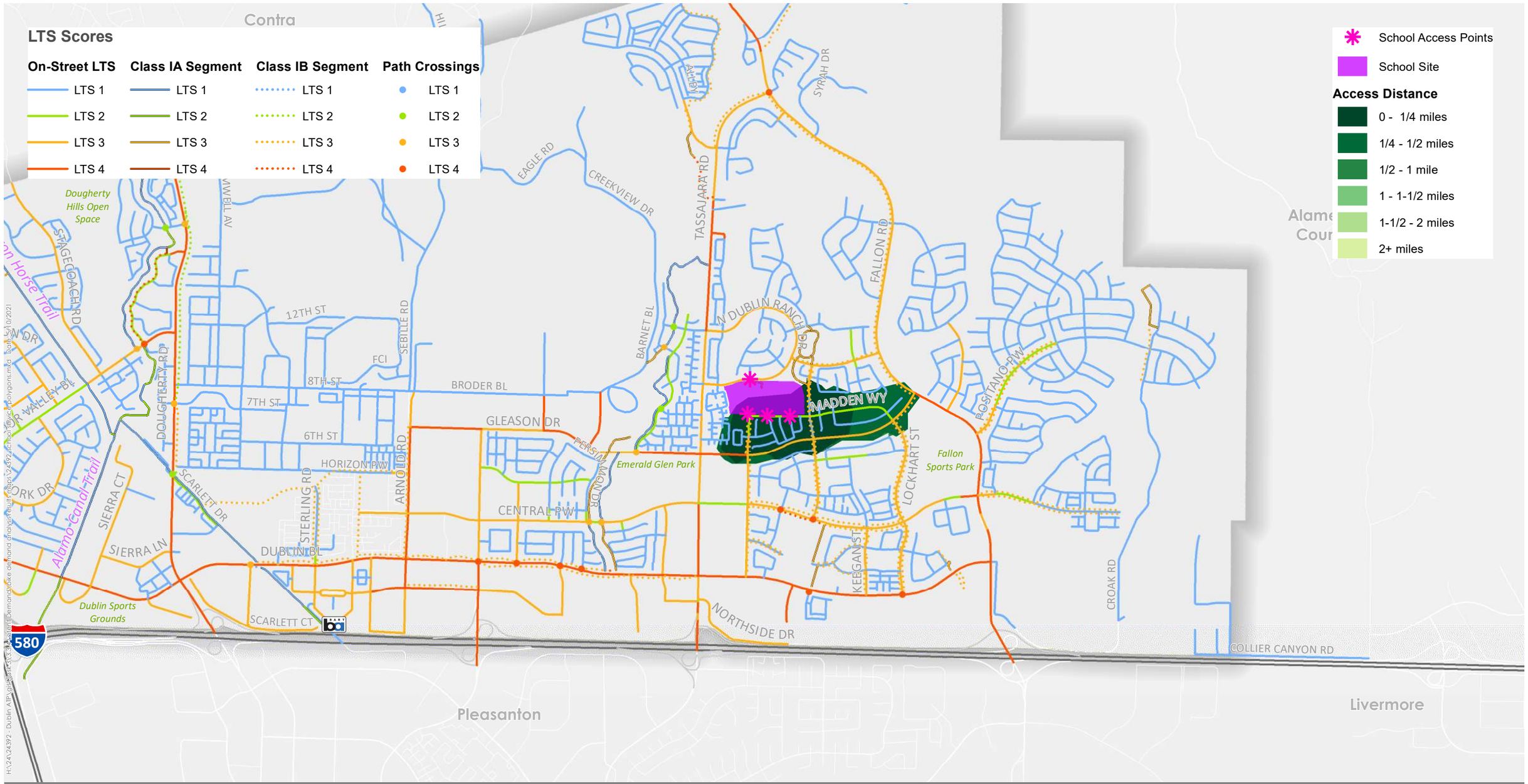

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Figure B.S.8

**Murray Elem**
**Network Service Area**
**Dublin, California**

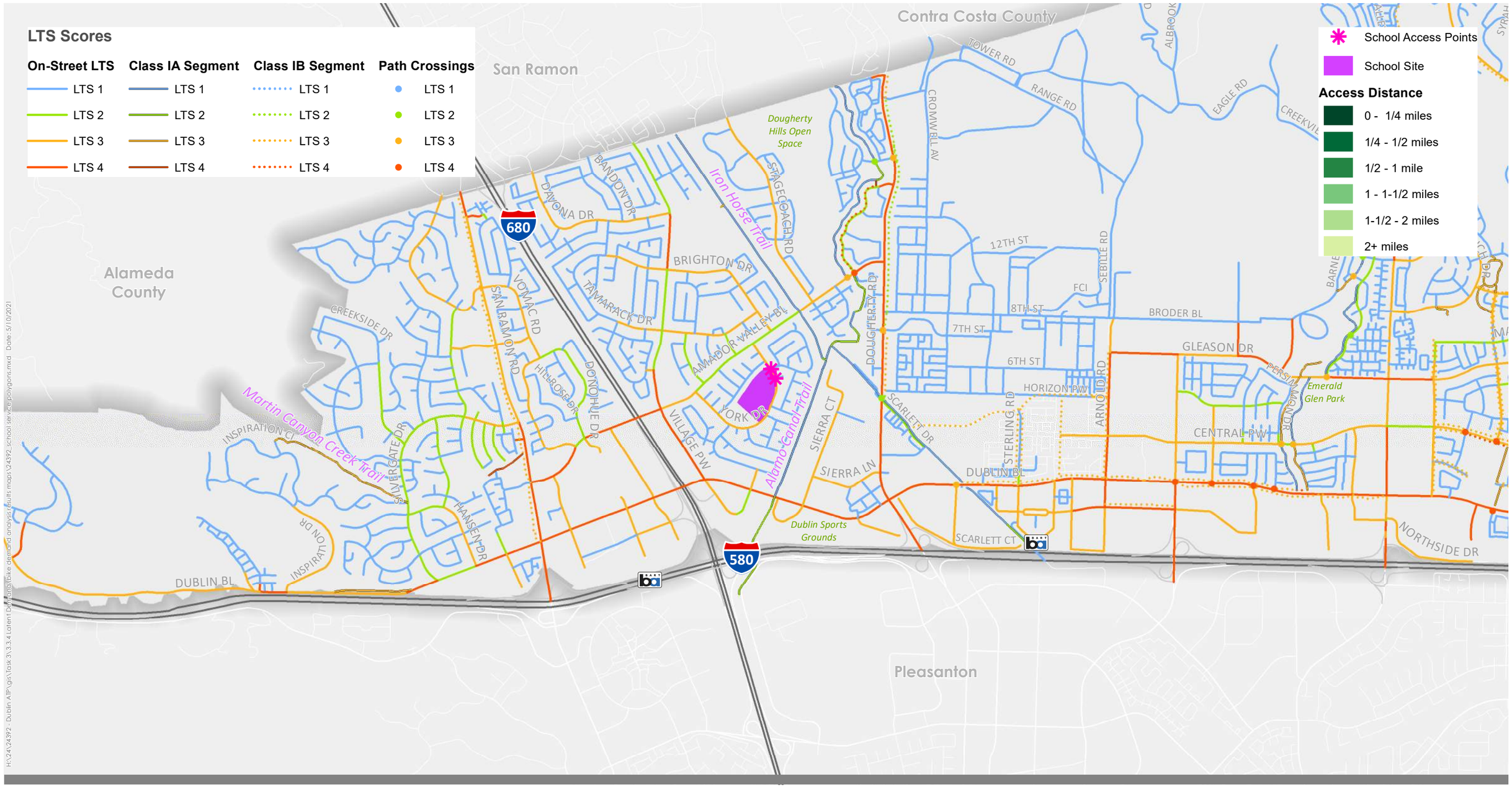



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Figure B.S.9

**Fallon Middle**
**Network Service Area**
**Dublin, California**

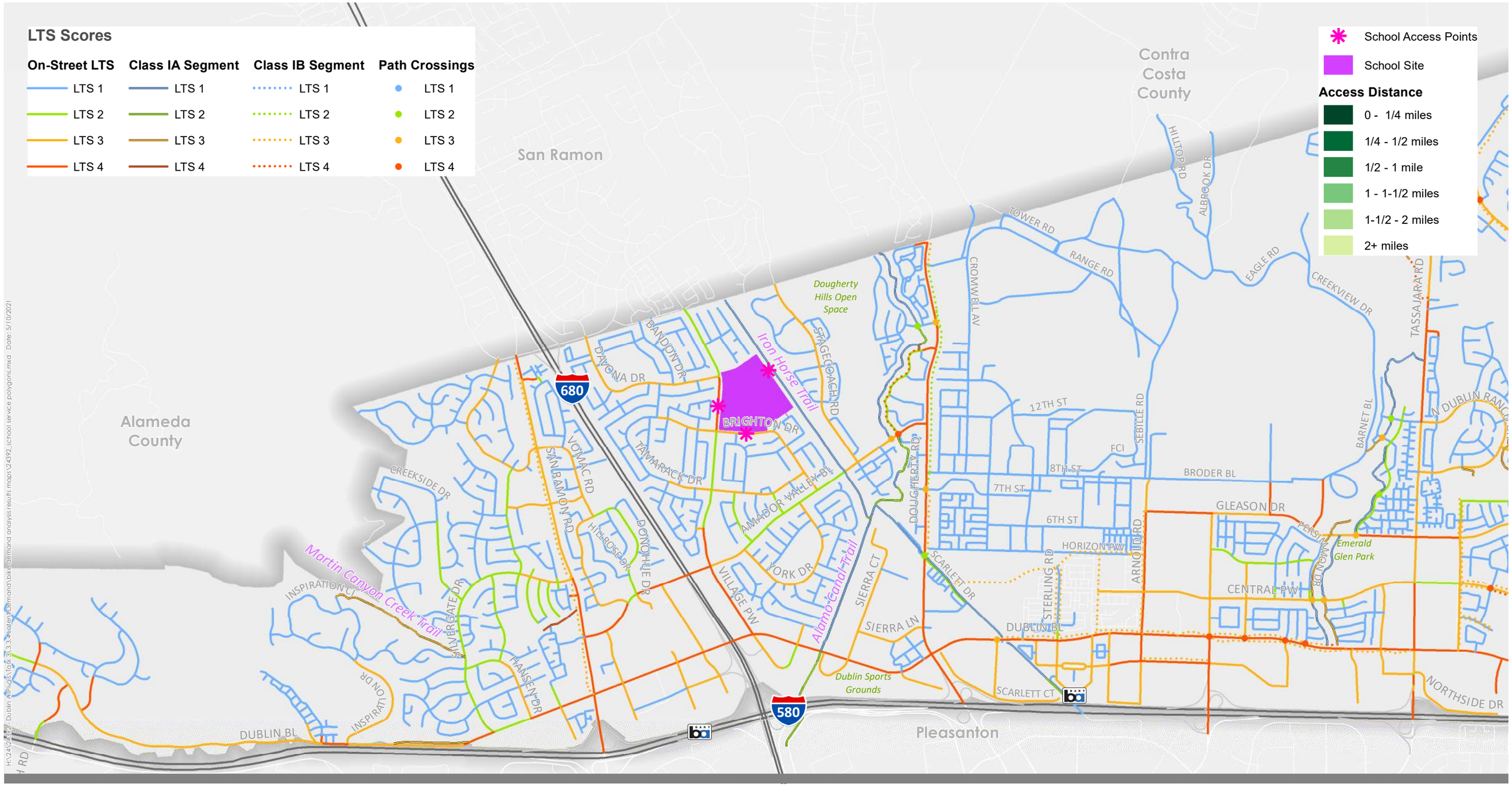



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Figure B.S.10

**Wells Middle**
**Network Service Area**
**Dublin, California**



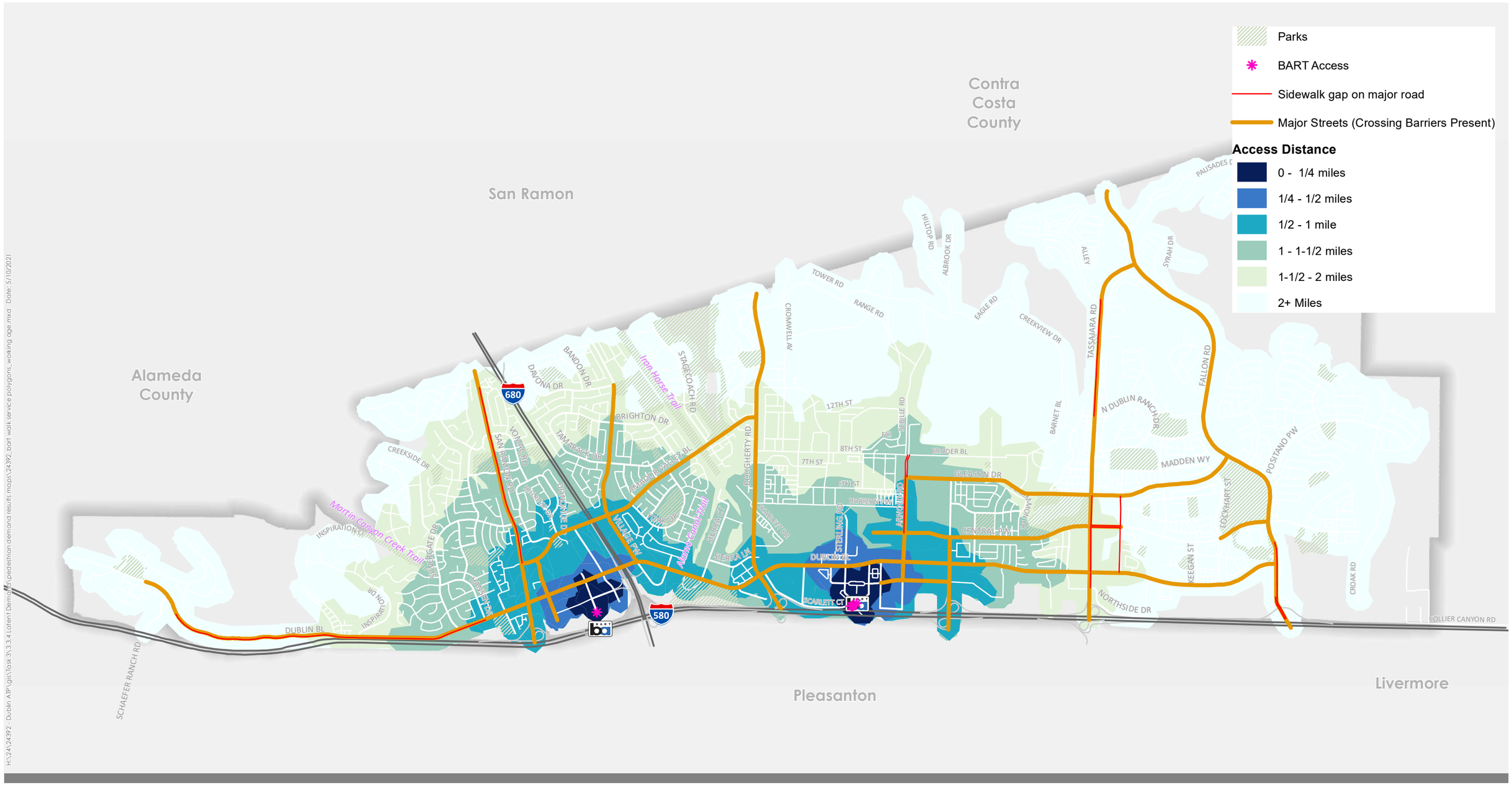

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Figure B.S.11

**Dublin High Network Service Area Dublin, California**



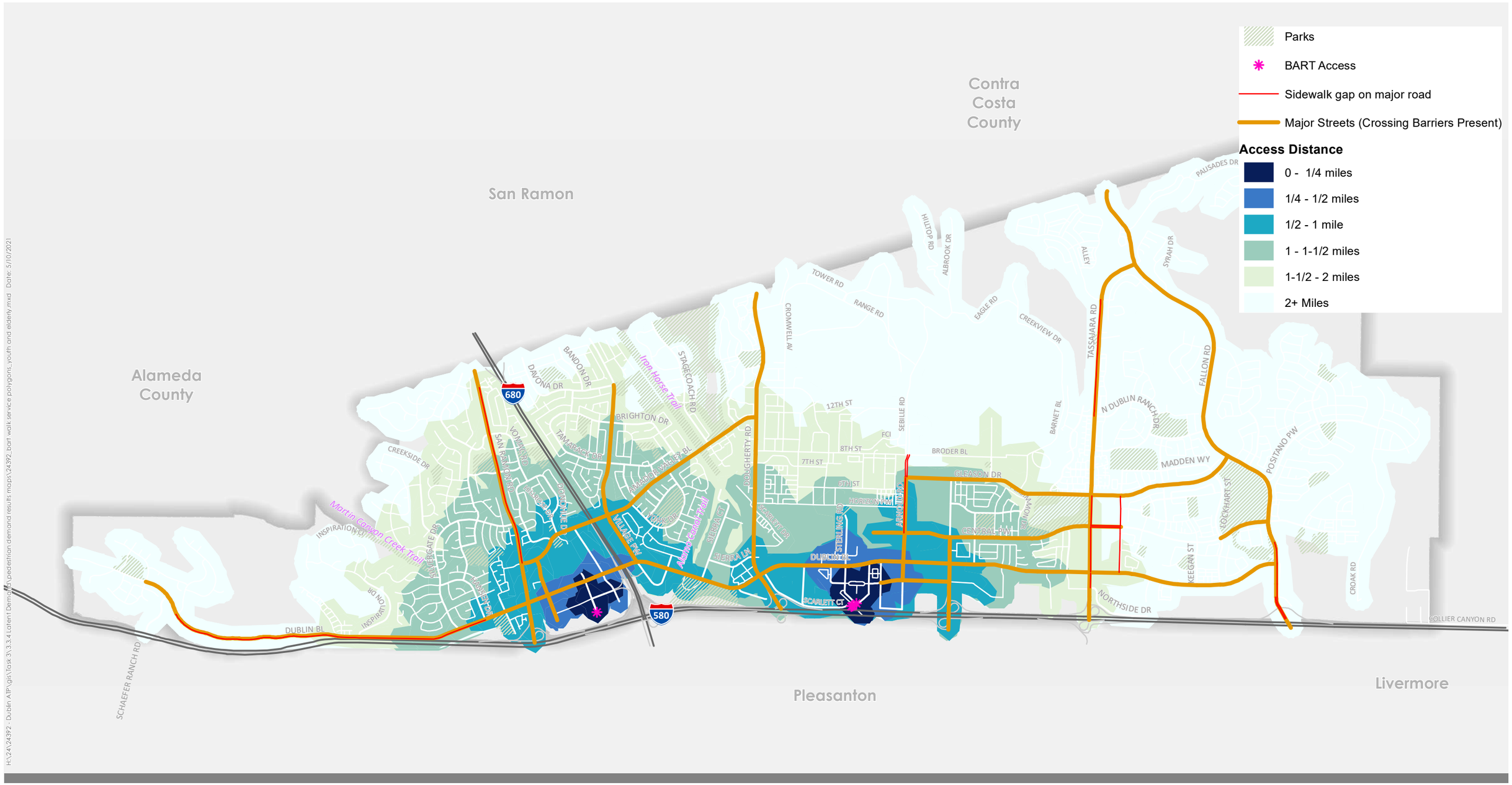

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Figure W.B.1

**BART Network Service Areas: Walking Perceived Distances**
**BART Access - 14 to 55 Years Old**
**Dublin, California**




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Figure W.B.2

**BART Network Service Areas: Walking Perceived Distances**
**BART Access - Over 55 Years Old**
**Dublin, California**

## LTS Scores

| On-Street LTS | Class IA Segment | Class IB Segment | Path Crossings |
|---|---|---|---|
| LTS 1 | LTS 1 | LTS 1 | LTS 1 |
| LTS 2 | LTS 2 | LTS 2 | LTS 2 |
| LTS 3 | LTS 3 | LTS 3 | LTS 3 |
| LTS 4 | LTS 4 | LTS 4 | LTS 4 |

Bart access points

**Access Distance**

- 0 - 1/4 miles
- 1/4 - 1/2 miles
- 1/2 - 1 mile
- 1 - 1-1/2 miles
- 1-1/2 - 2 miles
- 2+ miles

Contra Costa County

San Ramon

Alameda County

Pleasanton

Livermore

Dougherty Hills Open Space

Iron Horse Trail

Martin Canyon Creek Trail

Alamo Canal Trail

Dublin Sports Grounds

Emerald Glen Park

Fallon Sports Park

680

580

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Figure B.B.1

**BART Access - "Strong and Fearless" Network Service Area**
**Dublin, California**

## LTS Scores

| On-Street LTS | Class IA Segment | Class IB Segment | Path Crossings |
|---|---|---|---|
| LTS 1 | LTS 1 | LTS 1 | LTS 1 |
| LTS 2 | LTS 2 | LTS 2 | LTS 2 |
| LTS 3 | LTS 3 | LTS 3 | LTS 3 |
| LTS 4 | LTS 4 | LTS 4 | LTS 4 |

Bart access points

**Access Distance**

- 0 - 1/4 miles
- 1/4 - 1/2 miles
- 1/2 - 1 mile
- 1 - 1-1/2 miles
- 1-1/2 - 2 miles
- 2+ miles

Contra Costa County

San Ramon

Alameda County

Pleasanton

Livermore

Dougherty Hills Open Space

Fallon Sports Park

Emerald Glen Park

Dublin Sports Grounds

Martin Canyon Creek Trail

Arroyo Colorado Trail

680

580

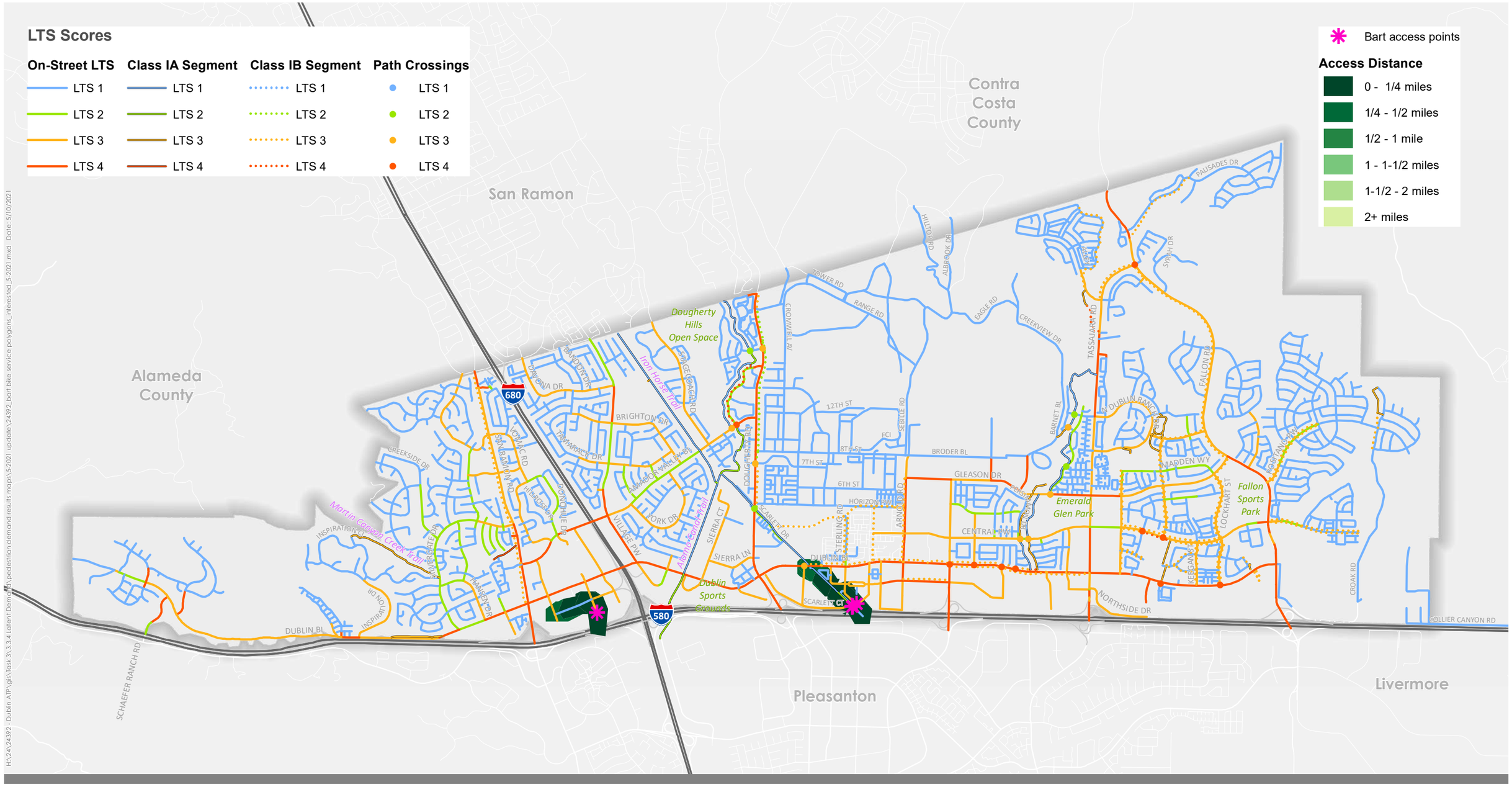
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Figure B.B.2

**BART Access - "Enthused and Confident" Network Service Area**
**Dublin, California**



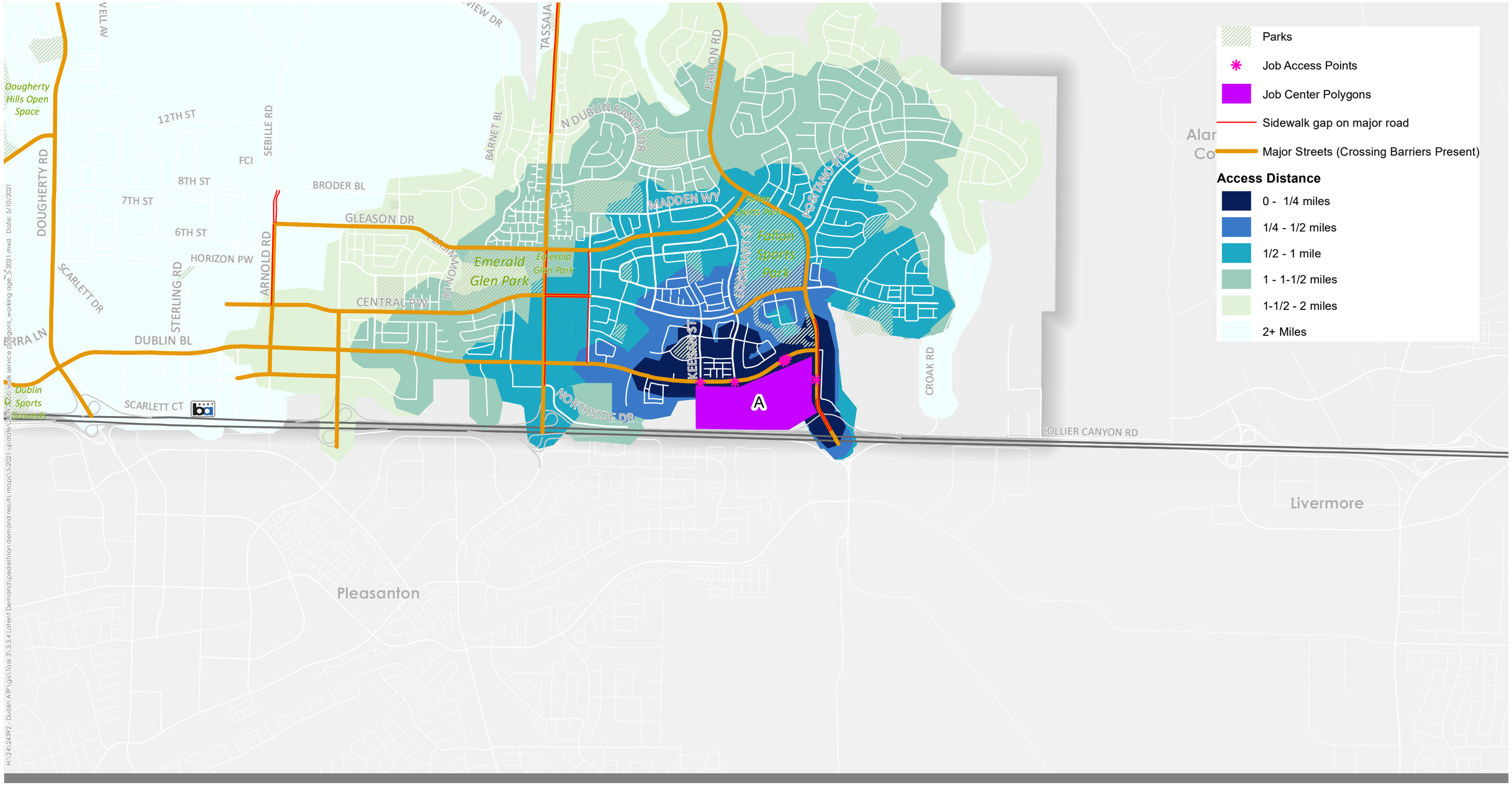

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Figure B.B.3

**BART Access - "Interested but Concerned" Network Service Area**
**Dublin, California**



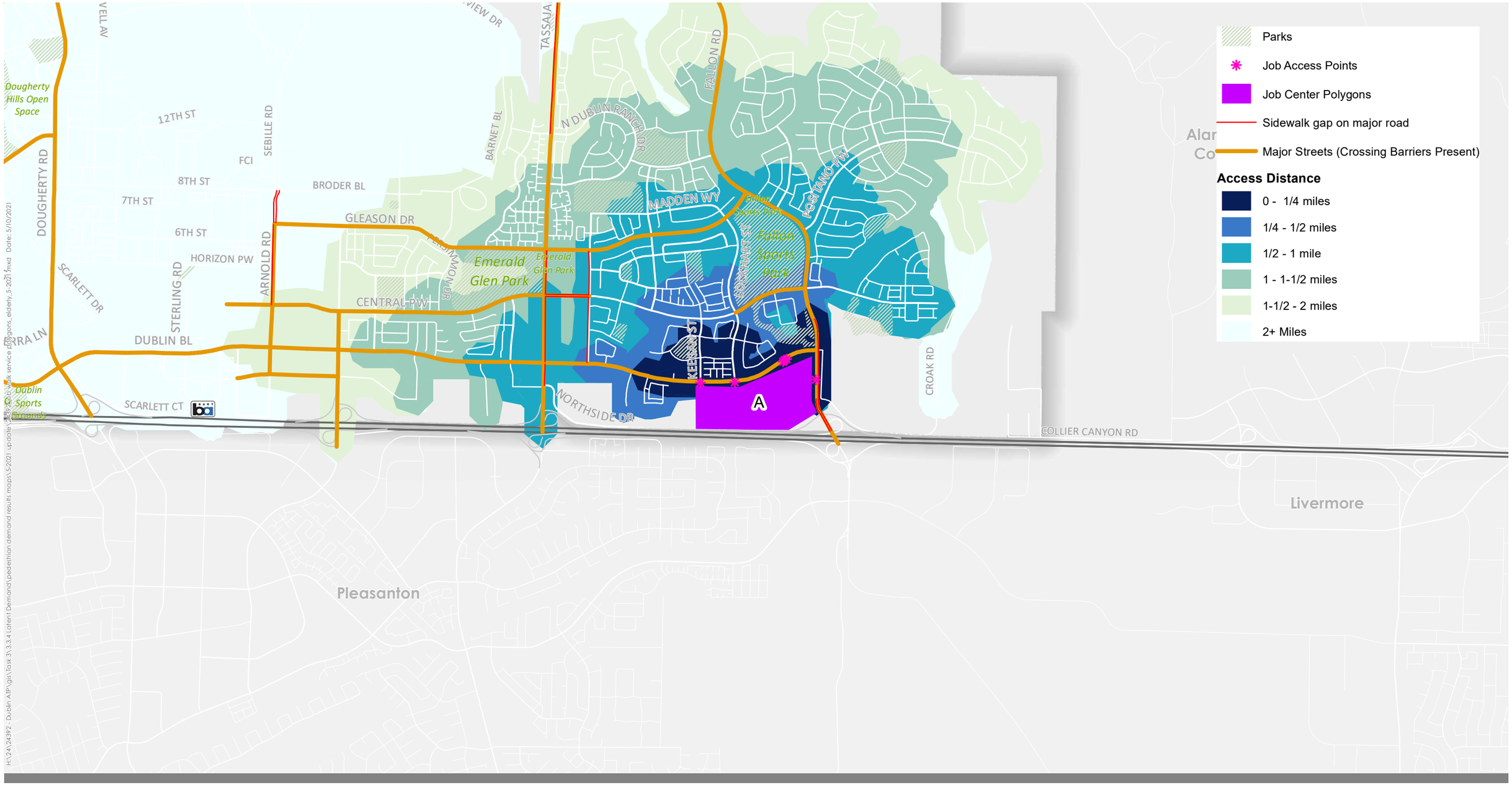

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Figure W.J.1a

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center A Access - 14 to 55 Years Old**
**Dublin, California**



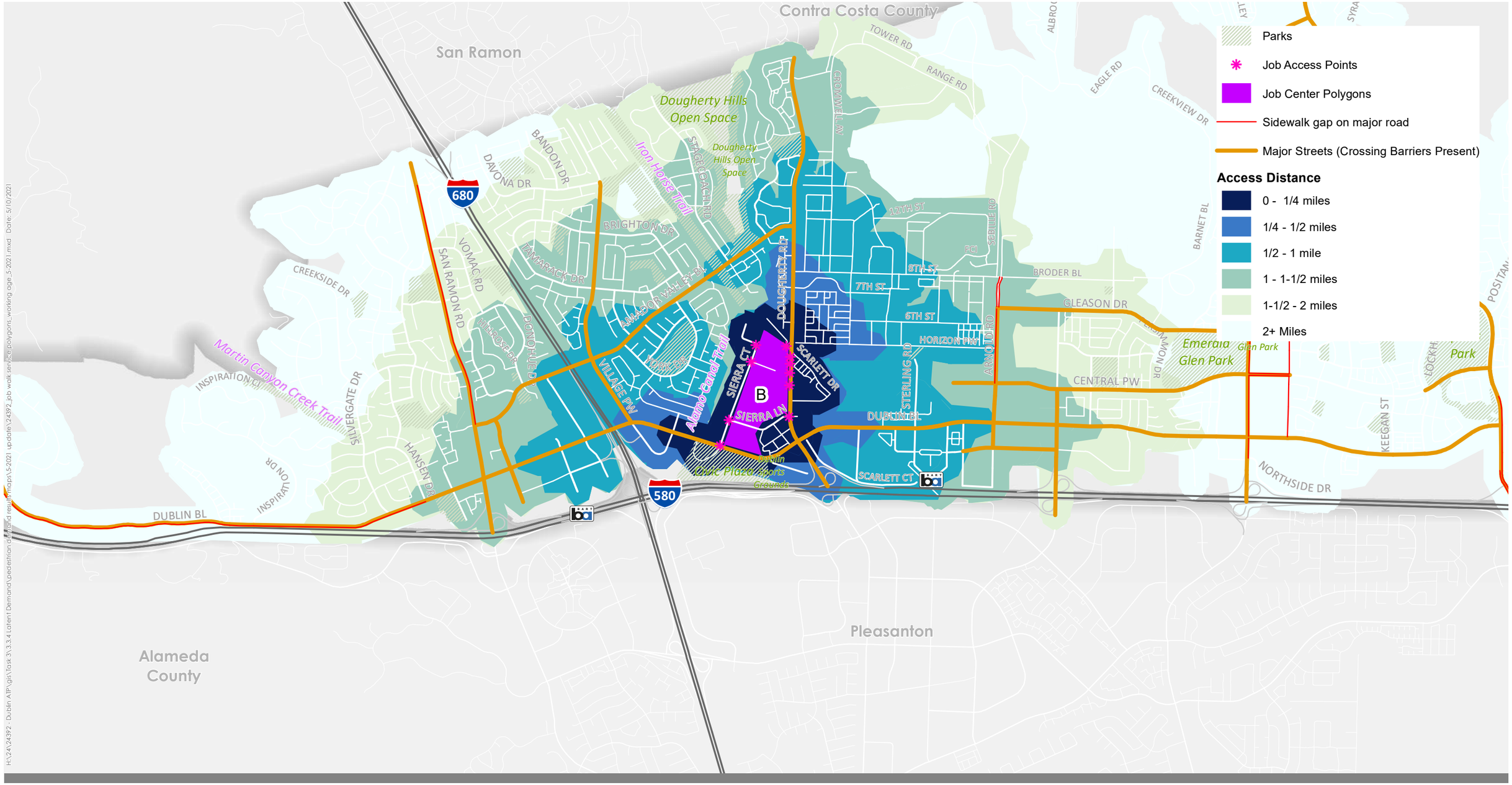

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5/2021 updated 2039 job data

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Figure W.J.1b

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center A Access - Over 55 Years Old**
**Dublin, California**



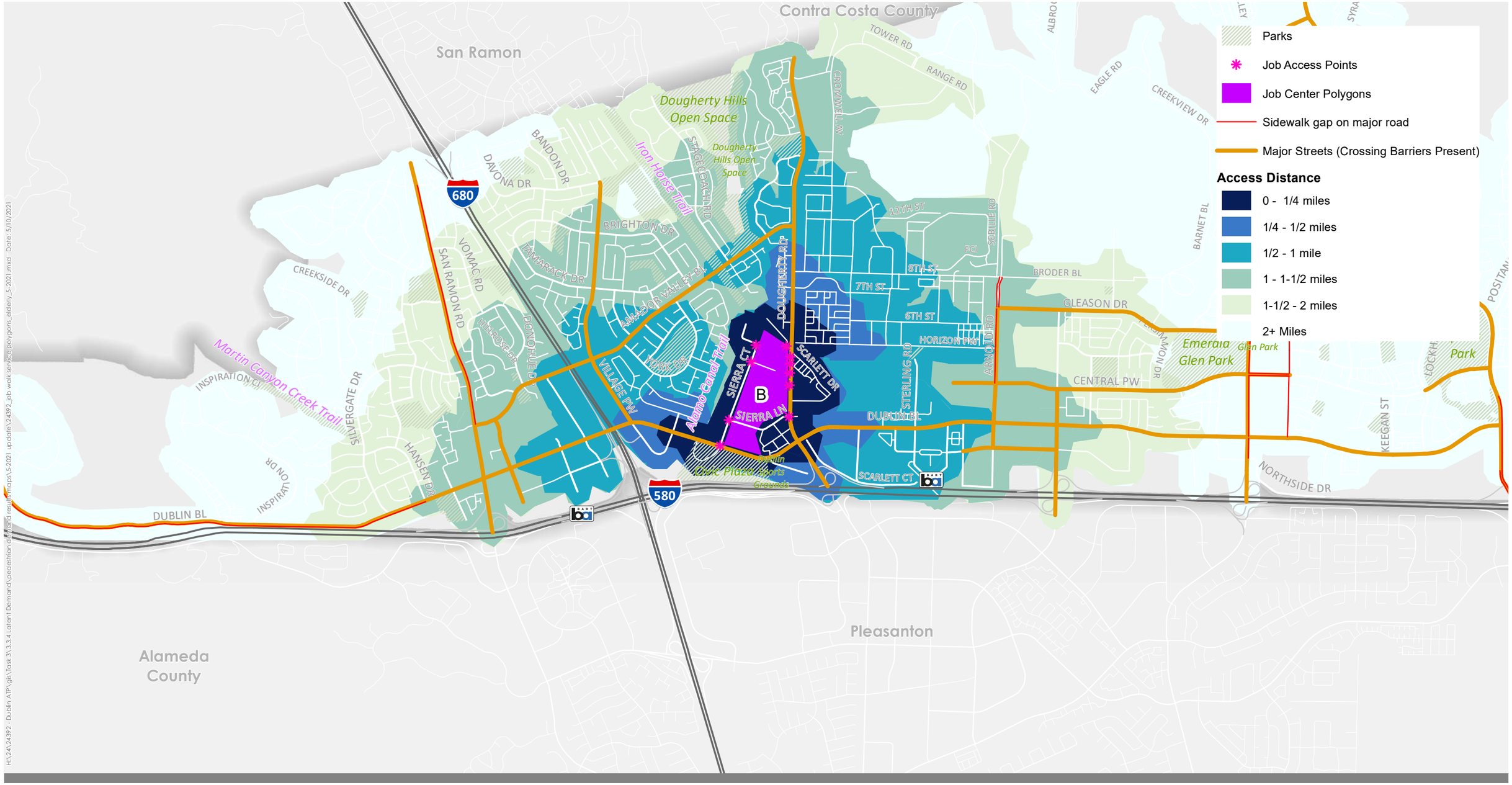

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Figure W.J.2a

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center B Access - 14 to 55 Years Old**
**Dublin, California**



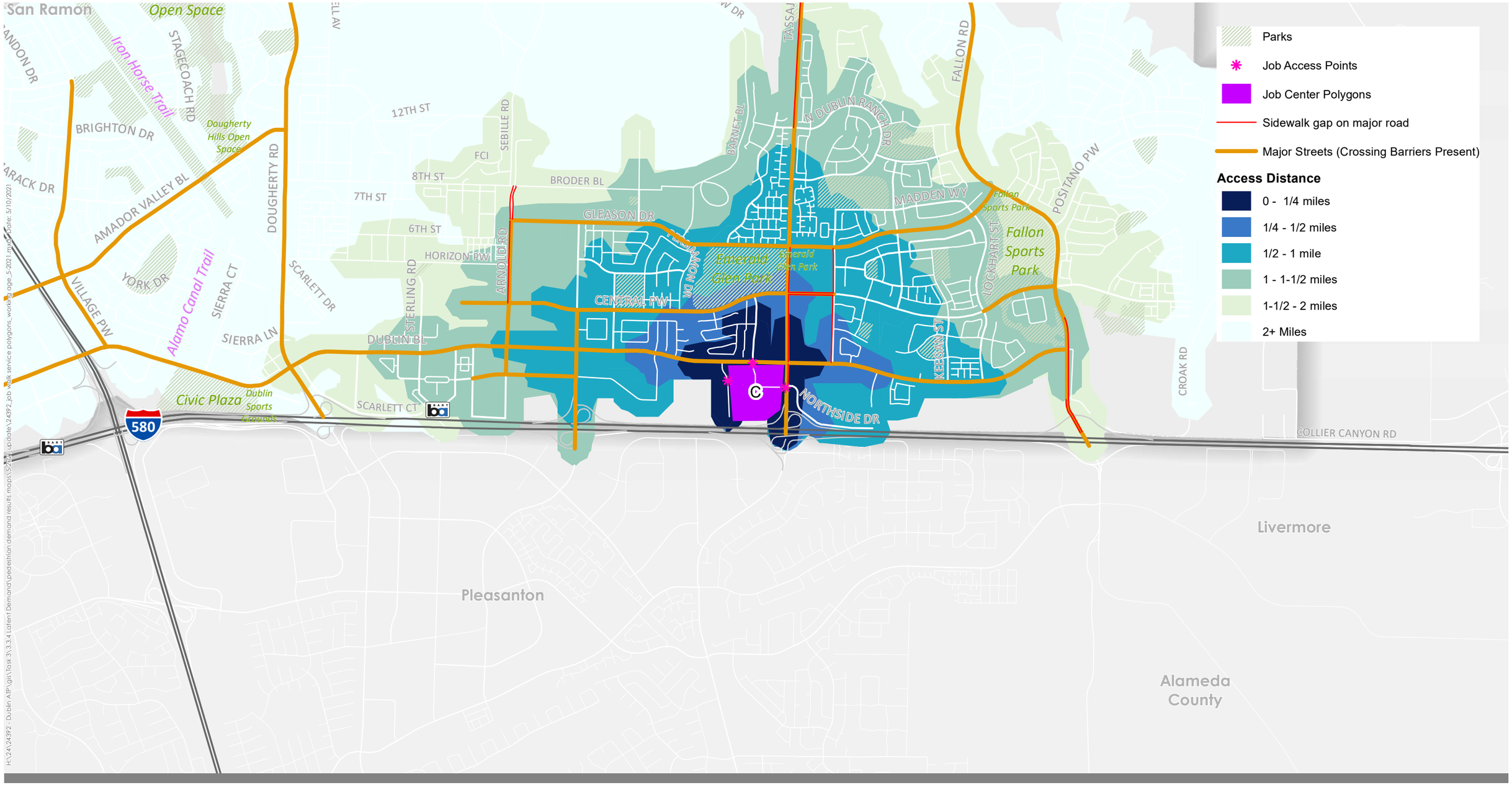

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Figure W.J.2b

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center B Access - Over 55 Years Old**
**Dublin, California**



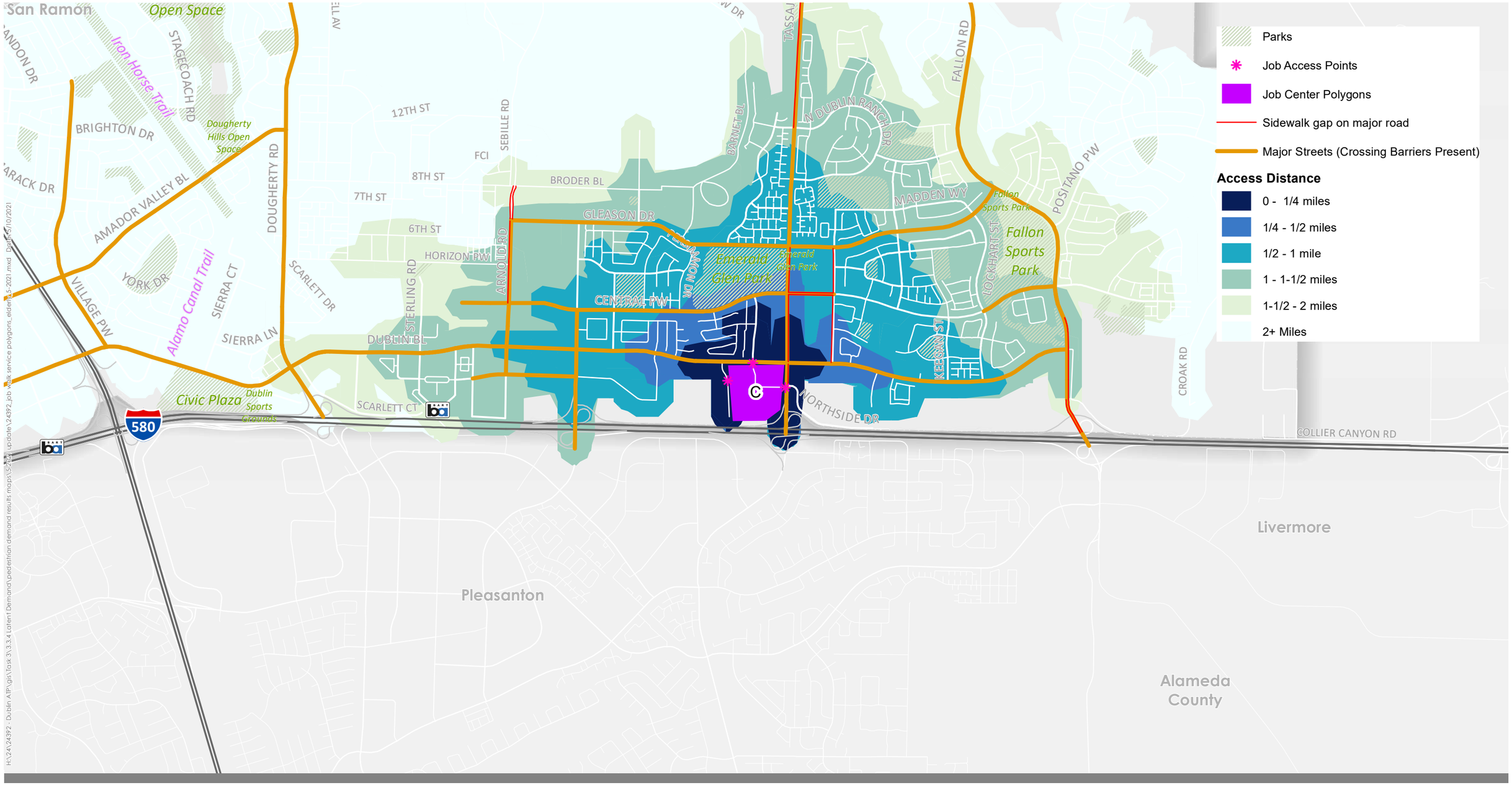

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Figure W.J.3a

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center C Access - 14 to 55 Years Old**
**Dublin, California**

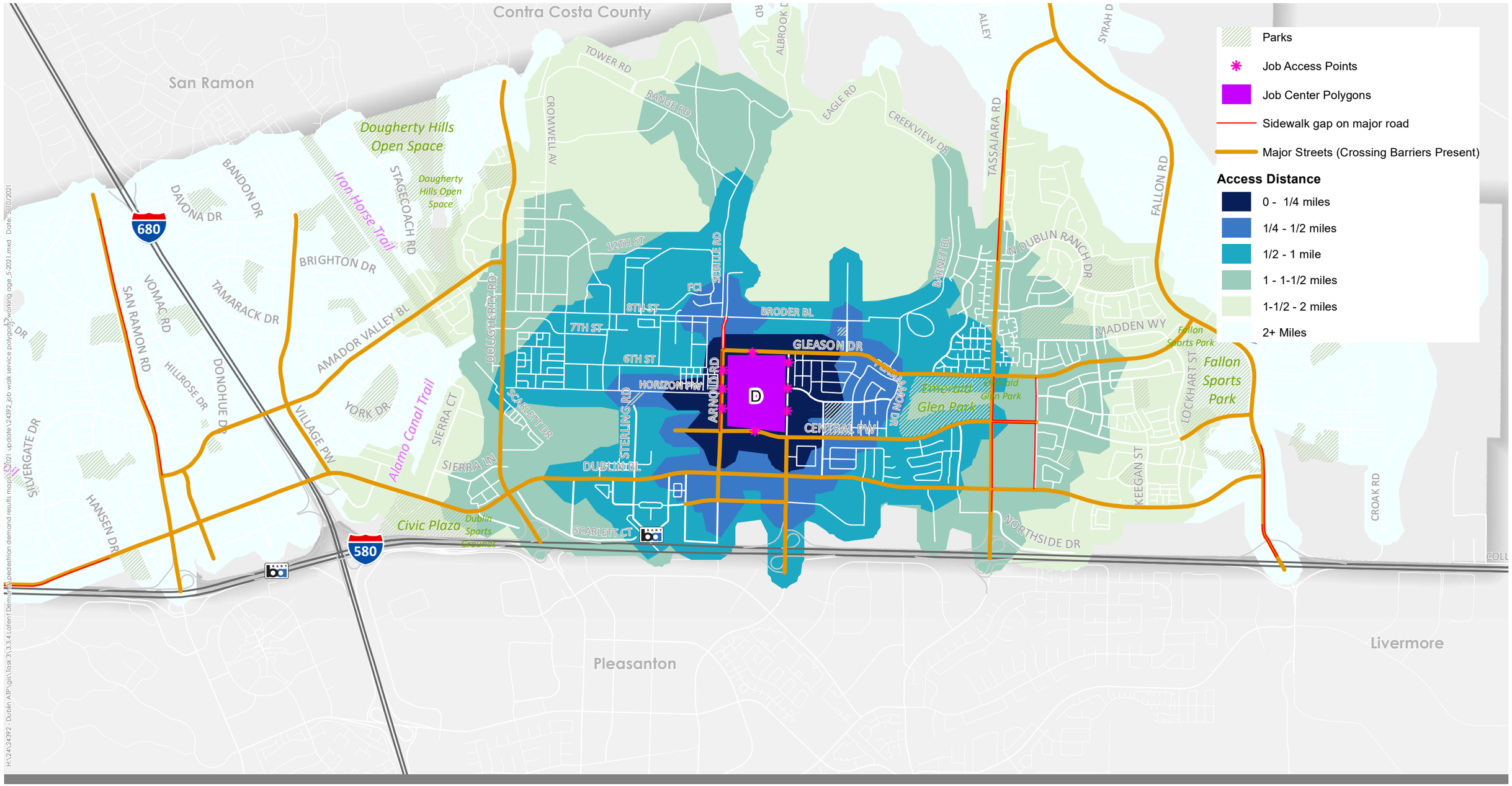



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Figure W.J.3b

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center C Access - Over 55 Years Old**
**Dublin, California**



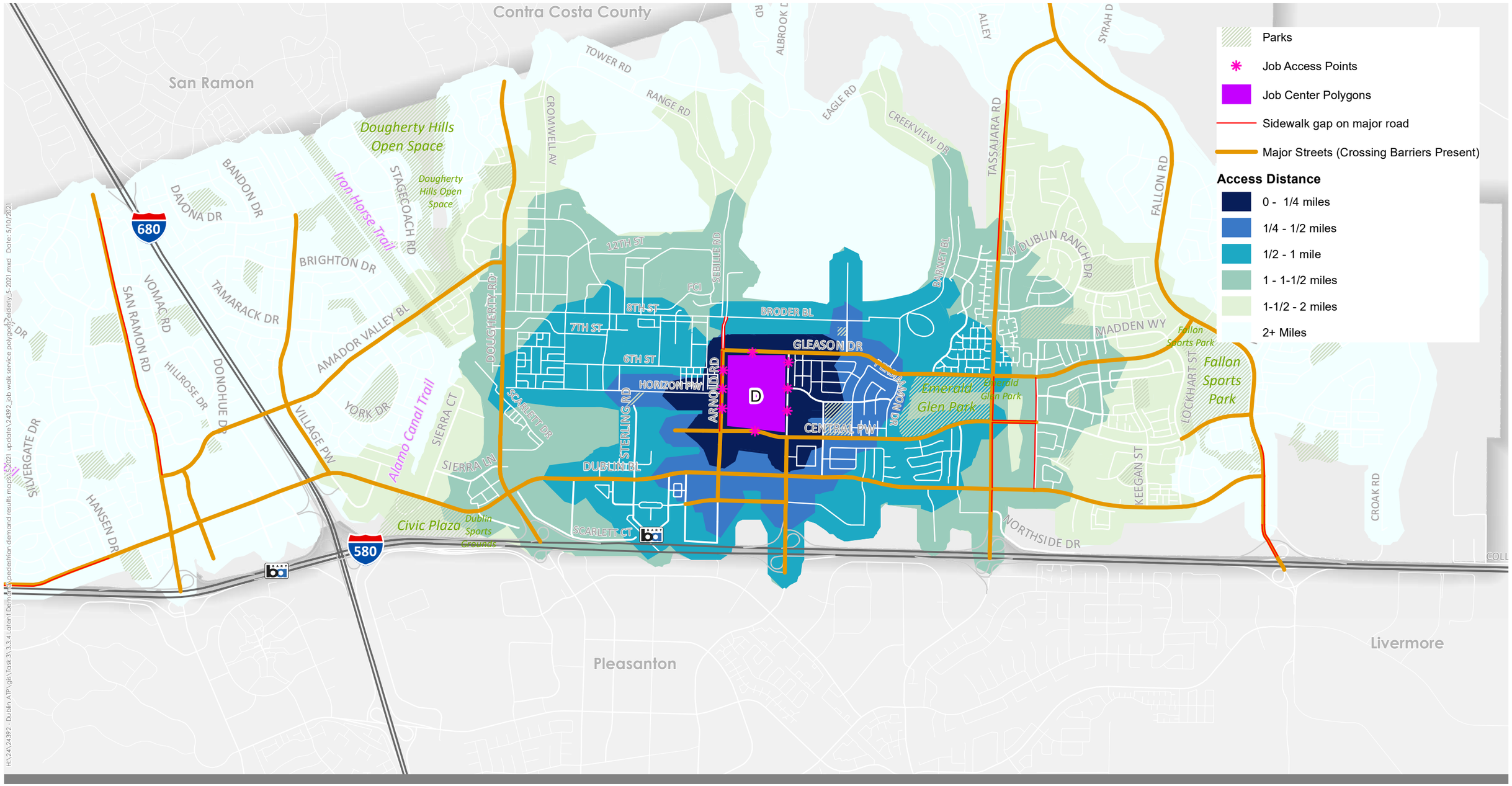

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Figure W.J.4a

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center D Access - 14 to 55 Years Old**
**Dublin, California**



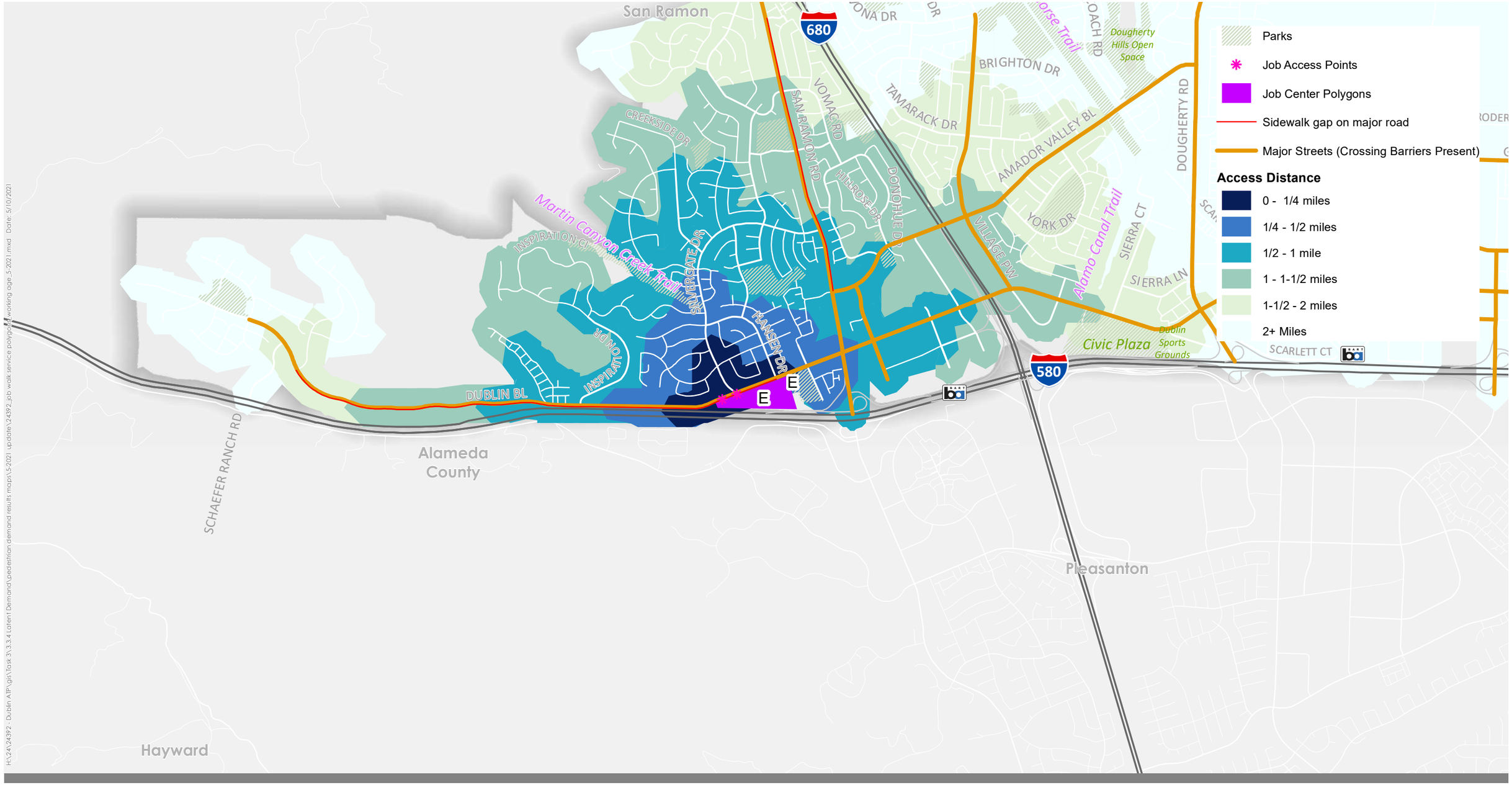

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Figure W.J.4b

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center D Access - Over 55 Years Old**
**Dublin, California**



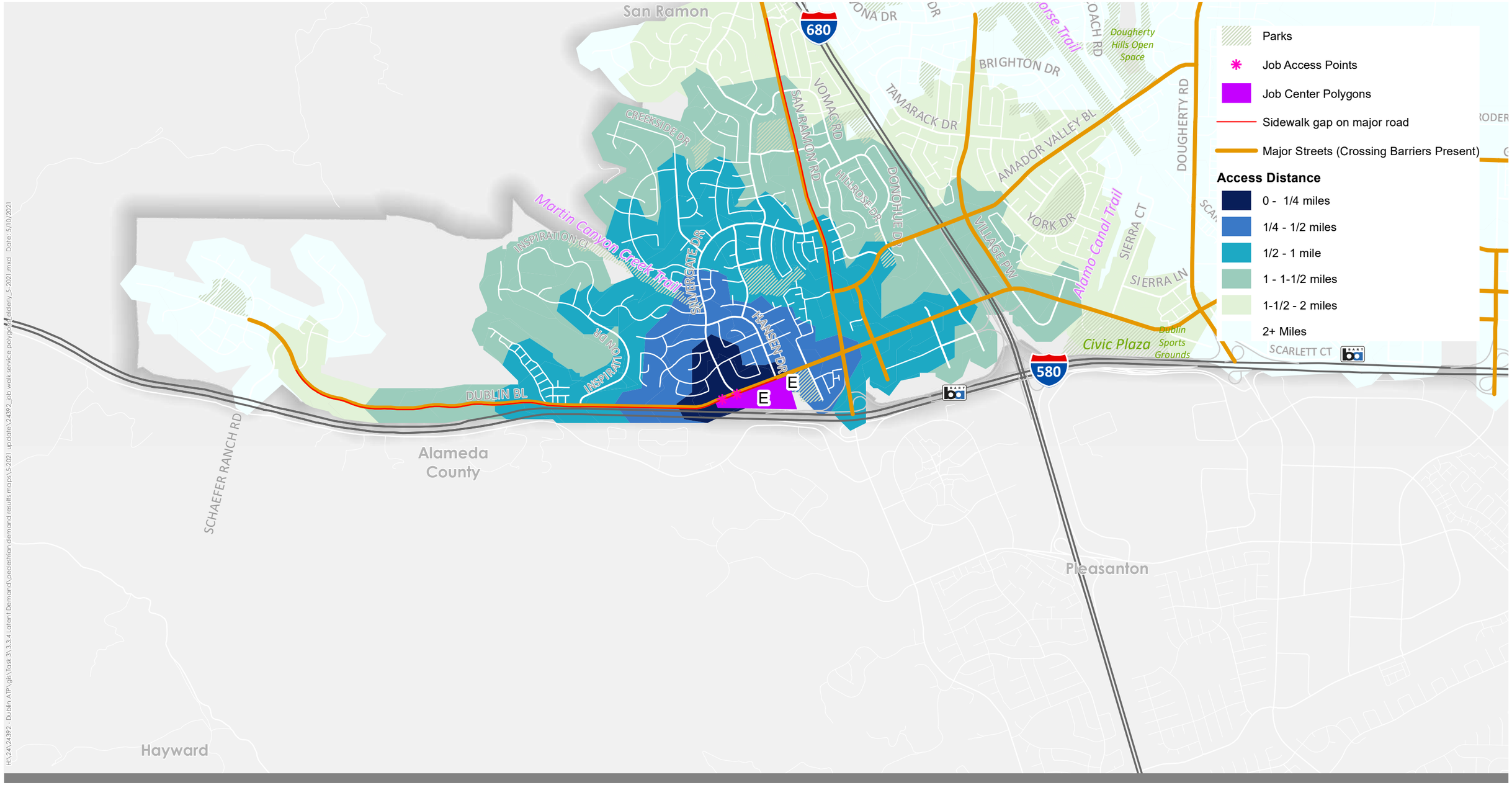

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Figure W.J.5a

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center E Access - 14 to 55 Years Old**
**Dublin, California**



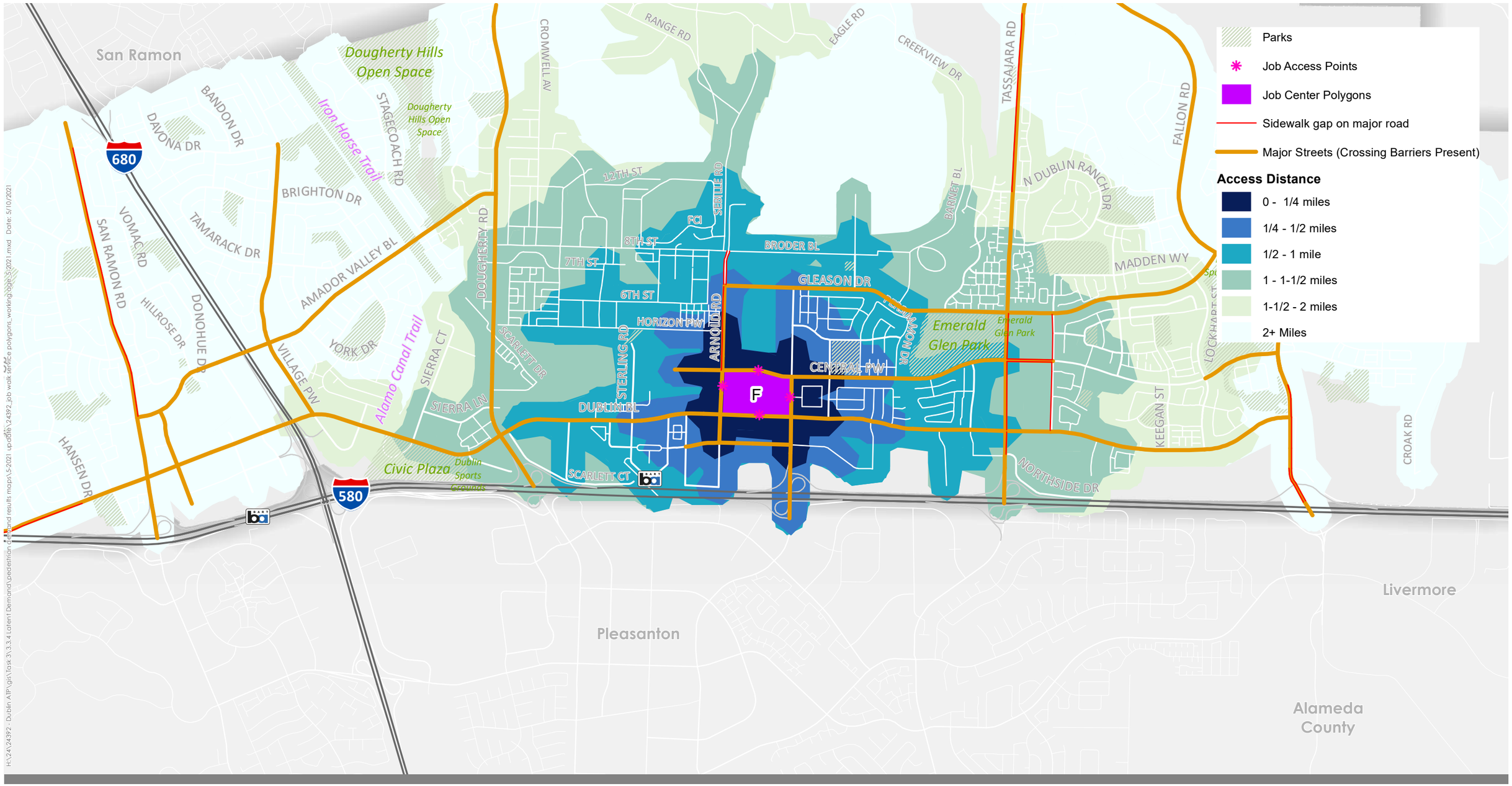

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Figure W.J.5b

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center E Access - Over 55 Years Old**
**Dublin, California**

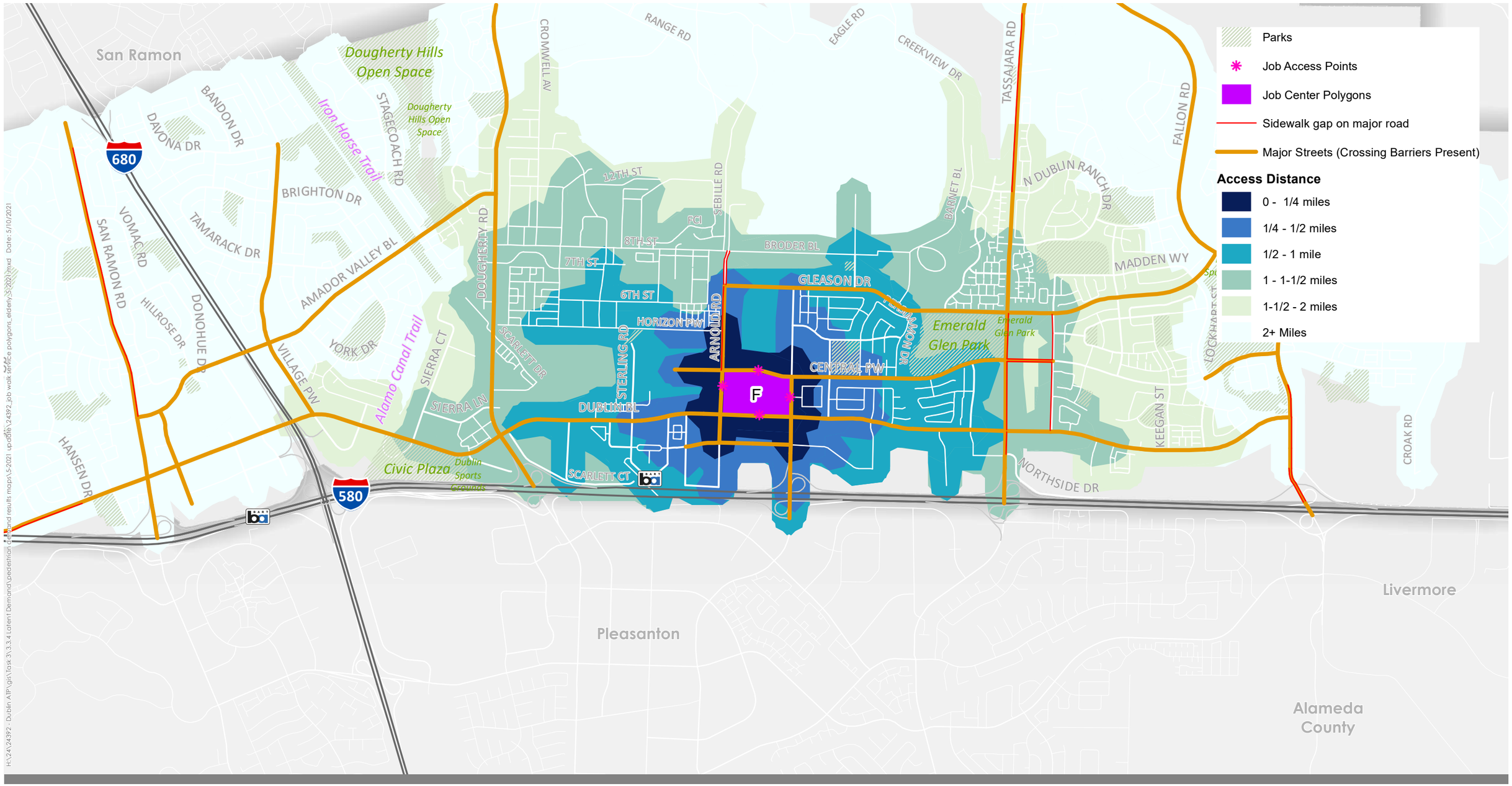



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Figure W.J.6a

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center F Access - 14 to 55 Years Old**
**Dublin, California**



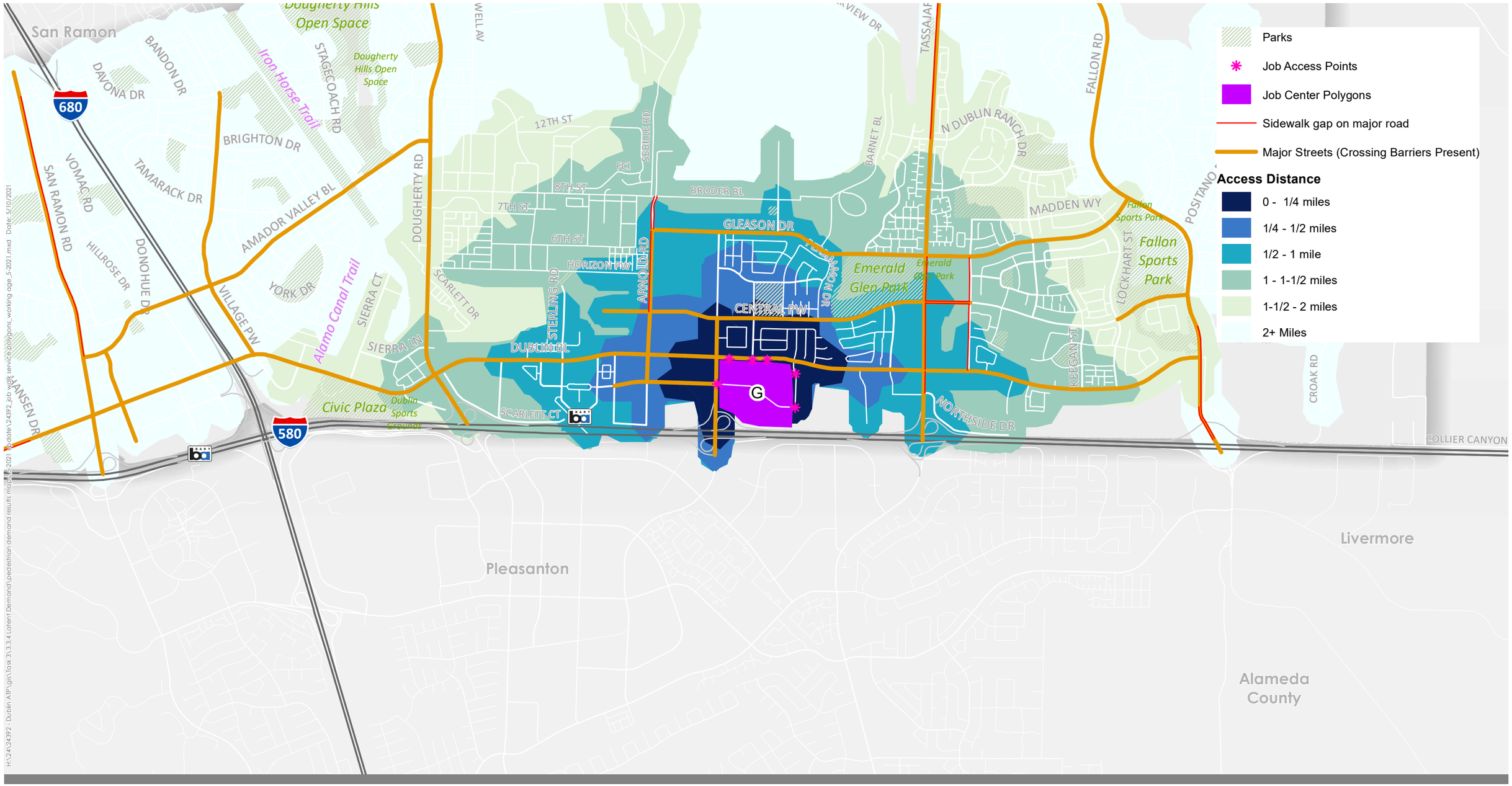

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Figure W.J.6b

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center F Access - Over 55 Years Old**
**Dublin, California**



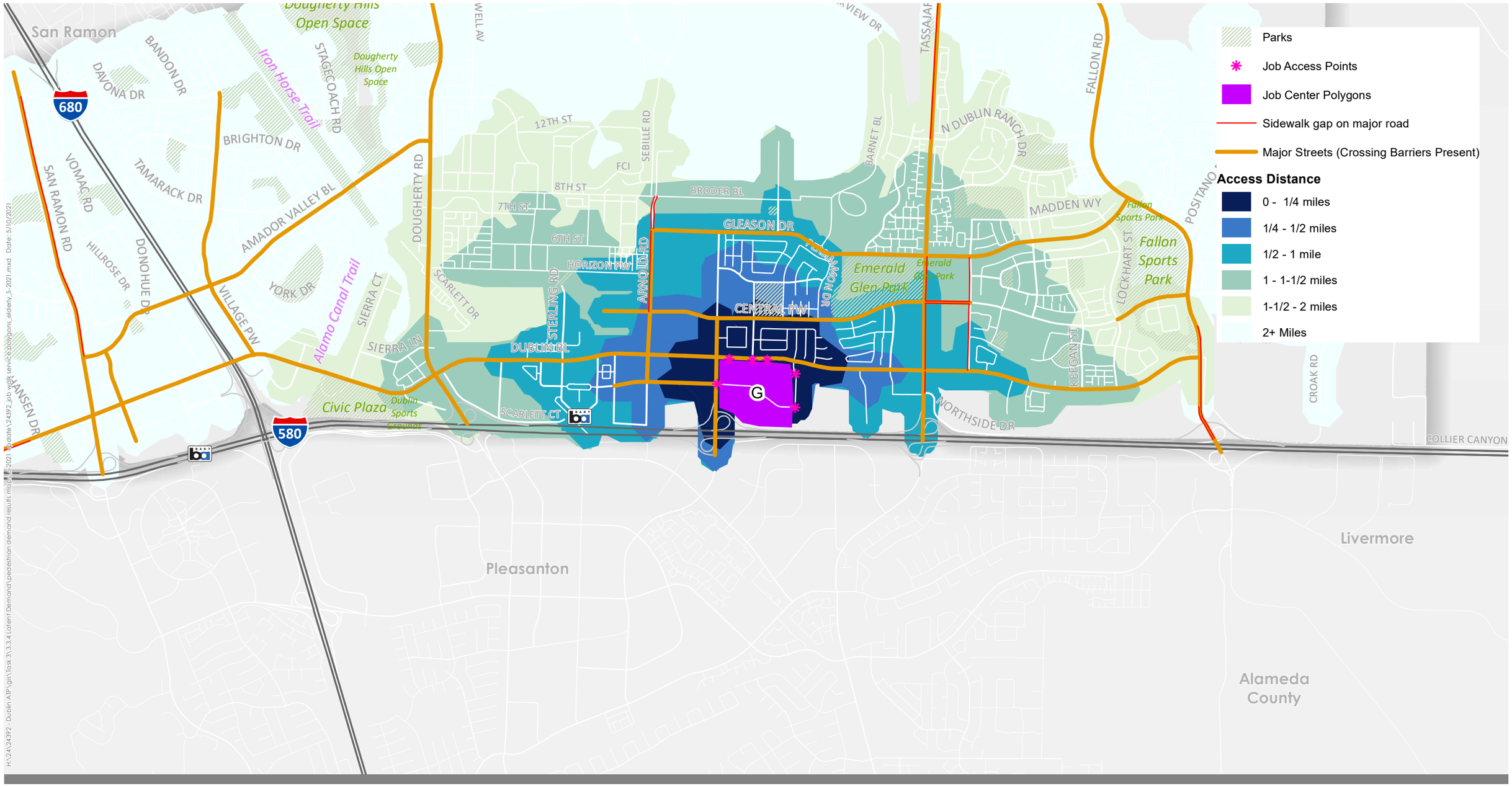

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Figure W.J.7a

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center G Access - 14 to 55 Years Old**
**Dublin, California**

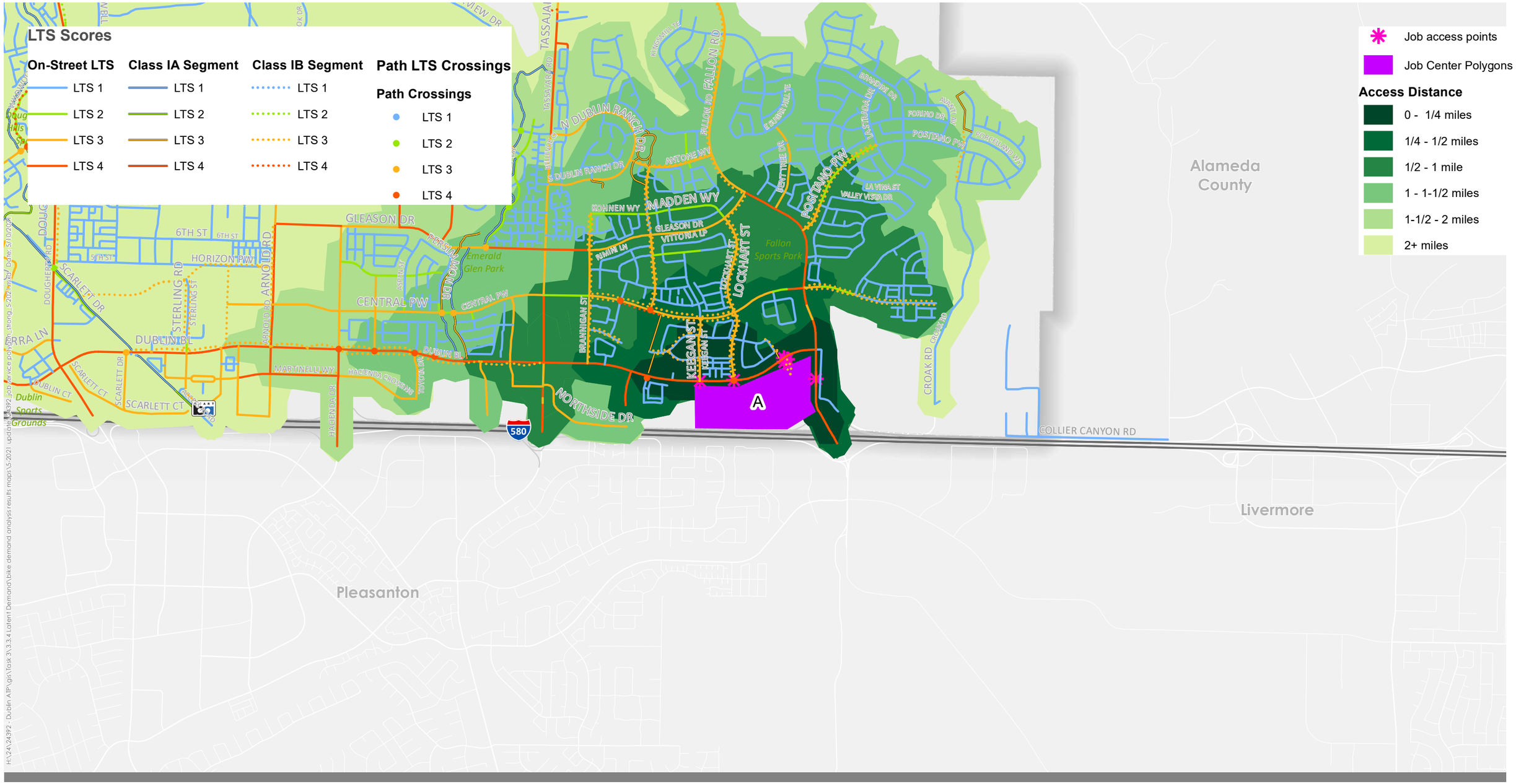



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Figure W.J.7b

**Job Center Network Service Areas: Walking Perceived Distances**
**Job Center G Access - Over 55 Years Old**
**Dublin, California**



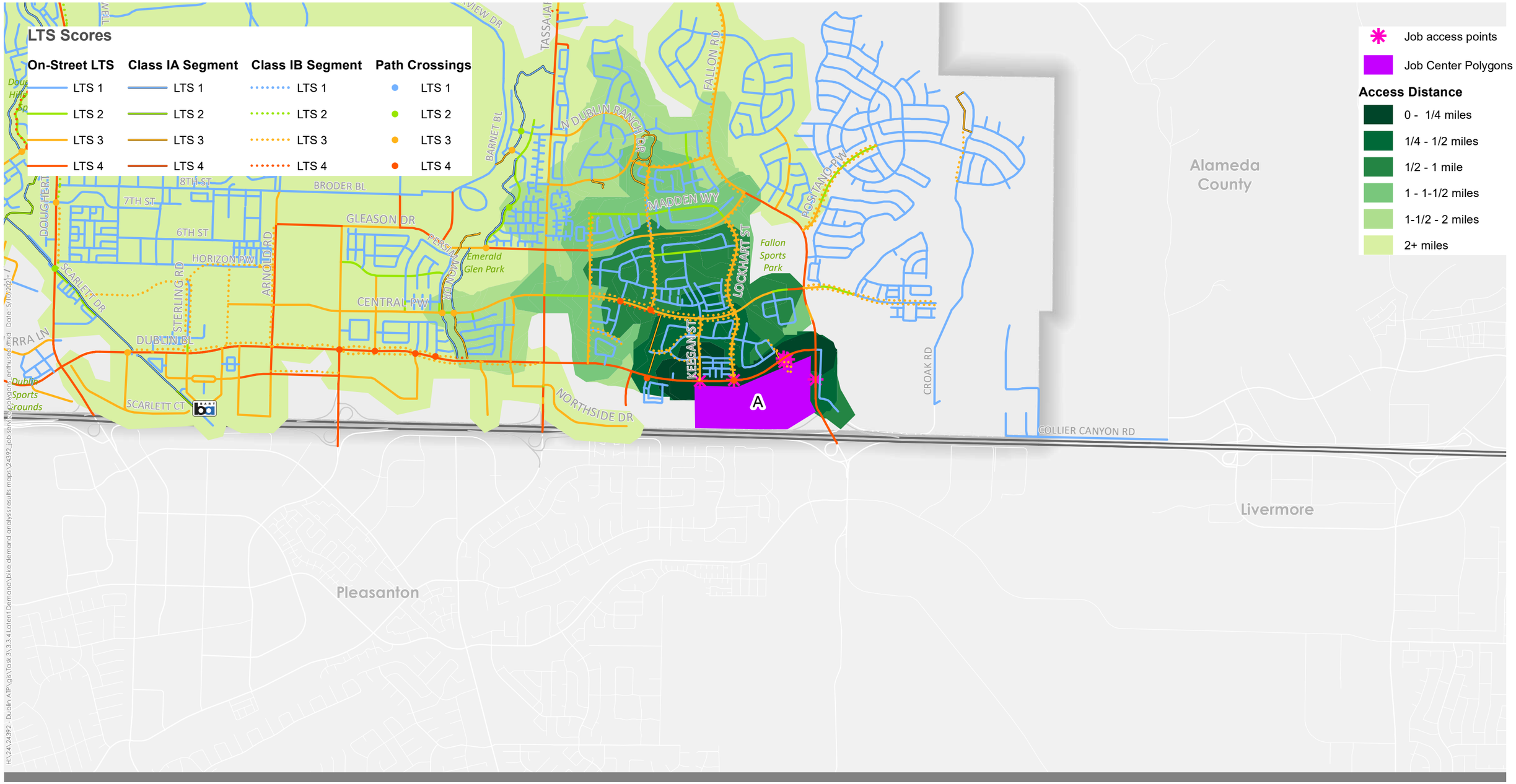

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Figure B.J.1a

**Job Center Polygon A Access - "Strong and Fearless" Network Service Area**
**Dublin, California**



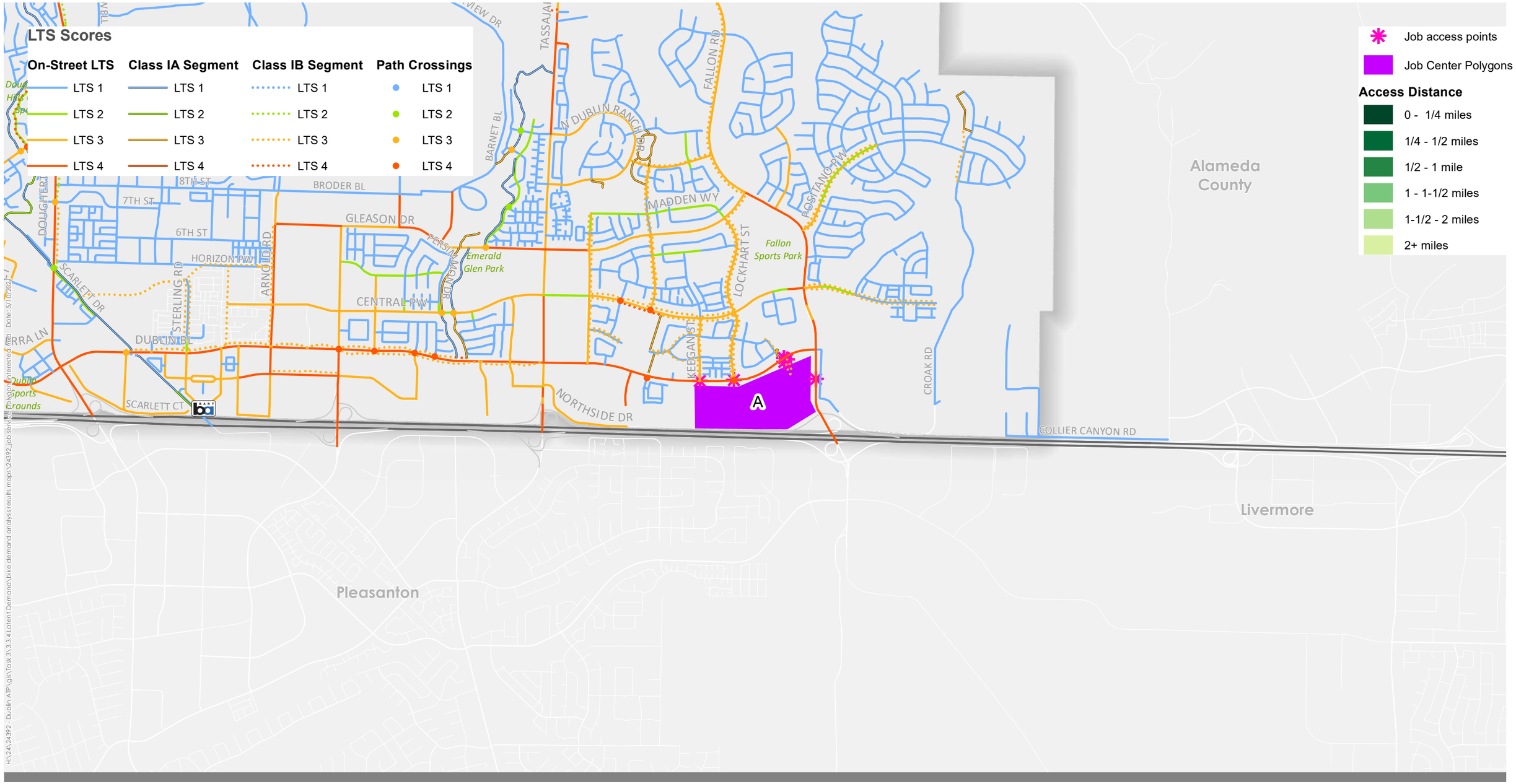

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Figure B.J.1b

**Job Center Polygon A Access - "Enthused and Confident" Network Service Area**
**Dublin, California**




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Figure B.J.1c

**Job Center Polygon A Access - "Interested but Concerned" Network Service Area**
**Dublin, California**

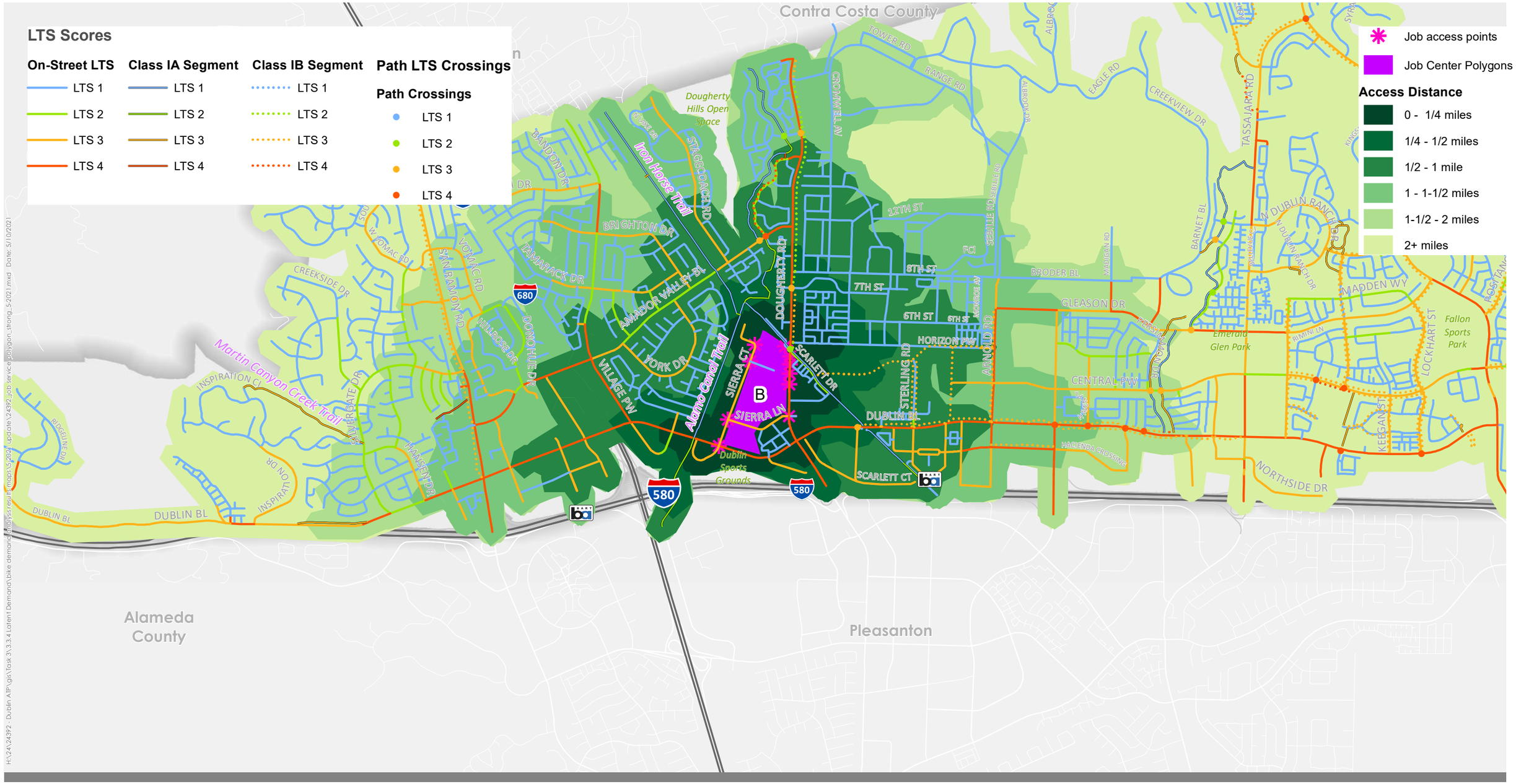
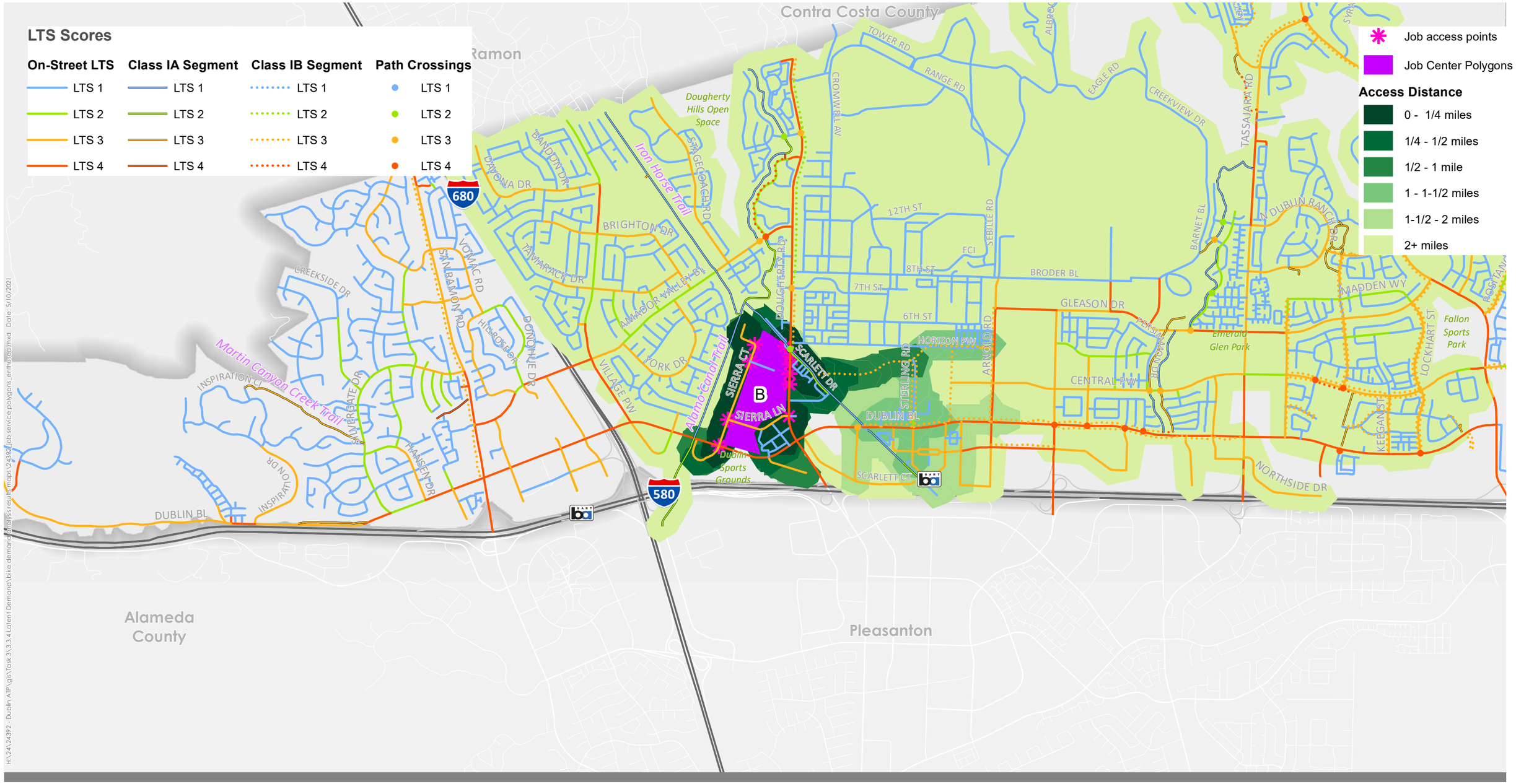



Figure B.J.2a

**Job Center Polygon B Access - "Strong and Fearless" Network Service Area**
**Dublin, California**

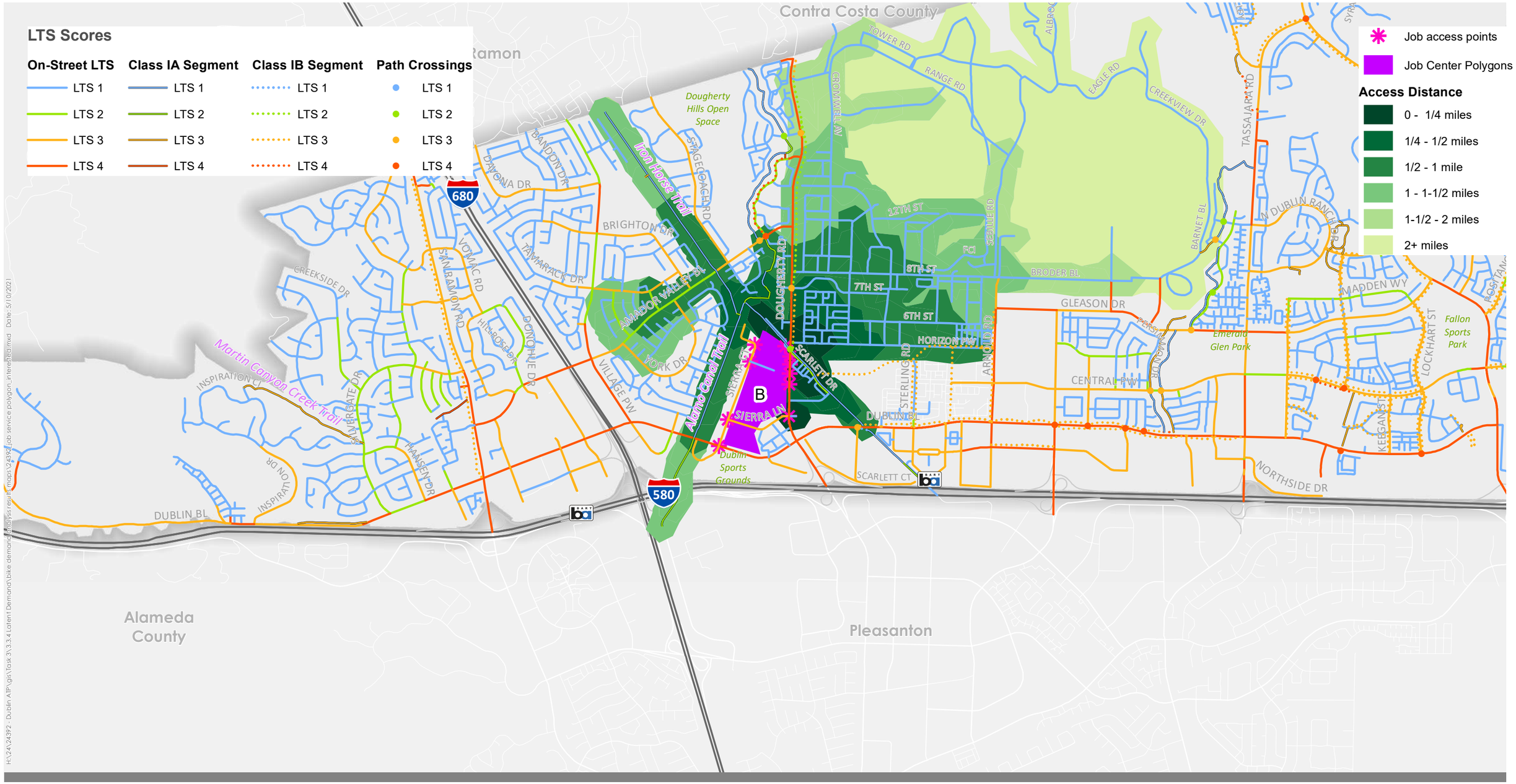



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Figure B.J.2b

**Job Center Polygon B Access - "Enthused and Confident" Network Service Area**
**Dublin, California**

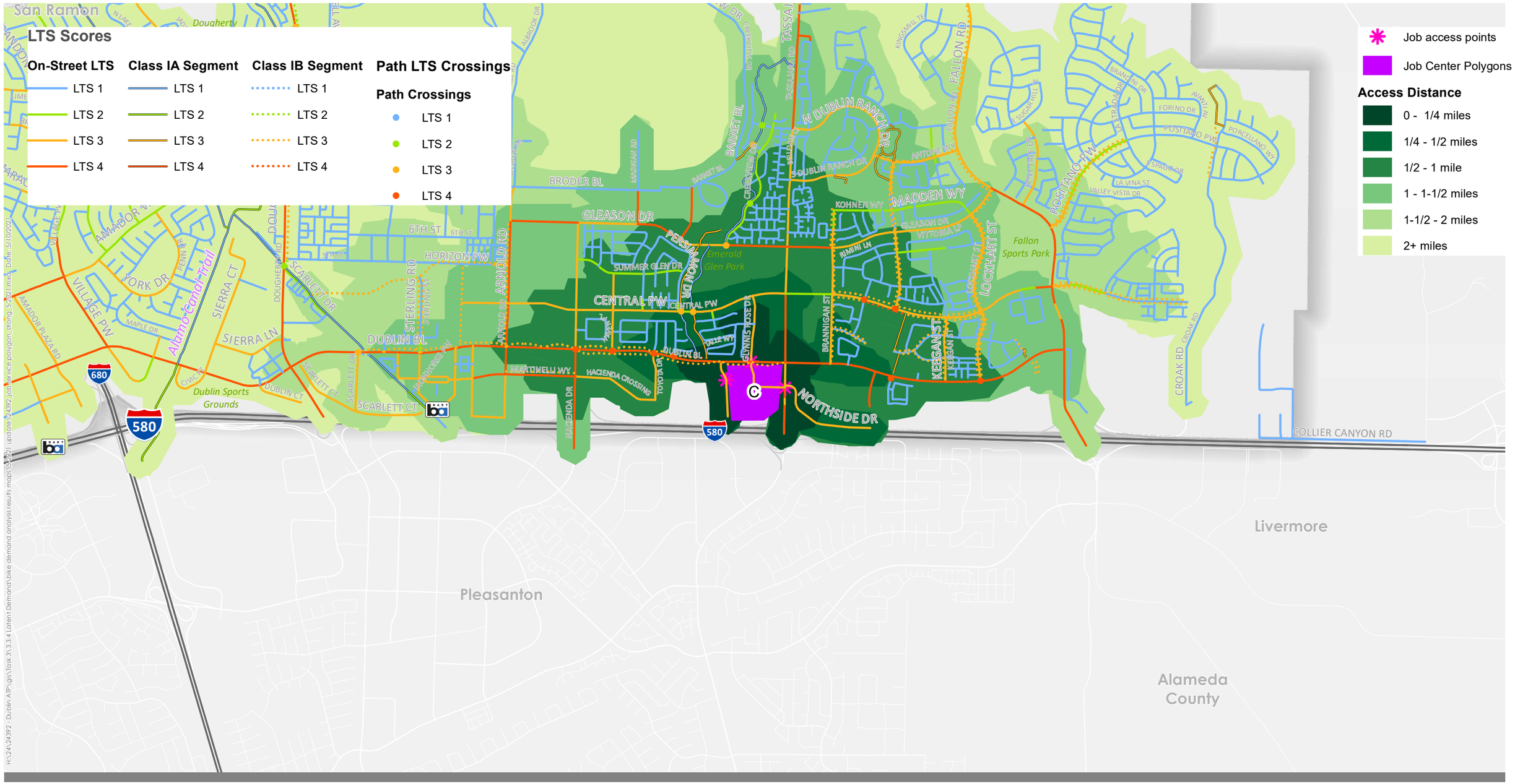



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Figure B.J.2c

**Job Center Polygon B Access - "Interested but Concerned" Network Service Area**
**Dublin, California**



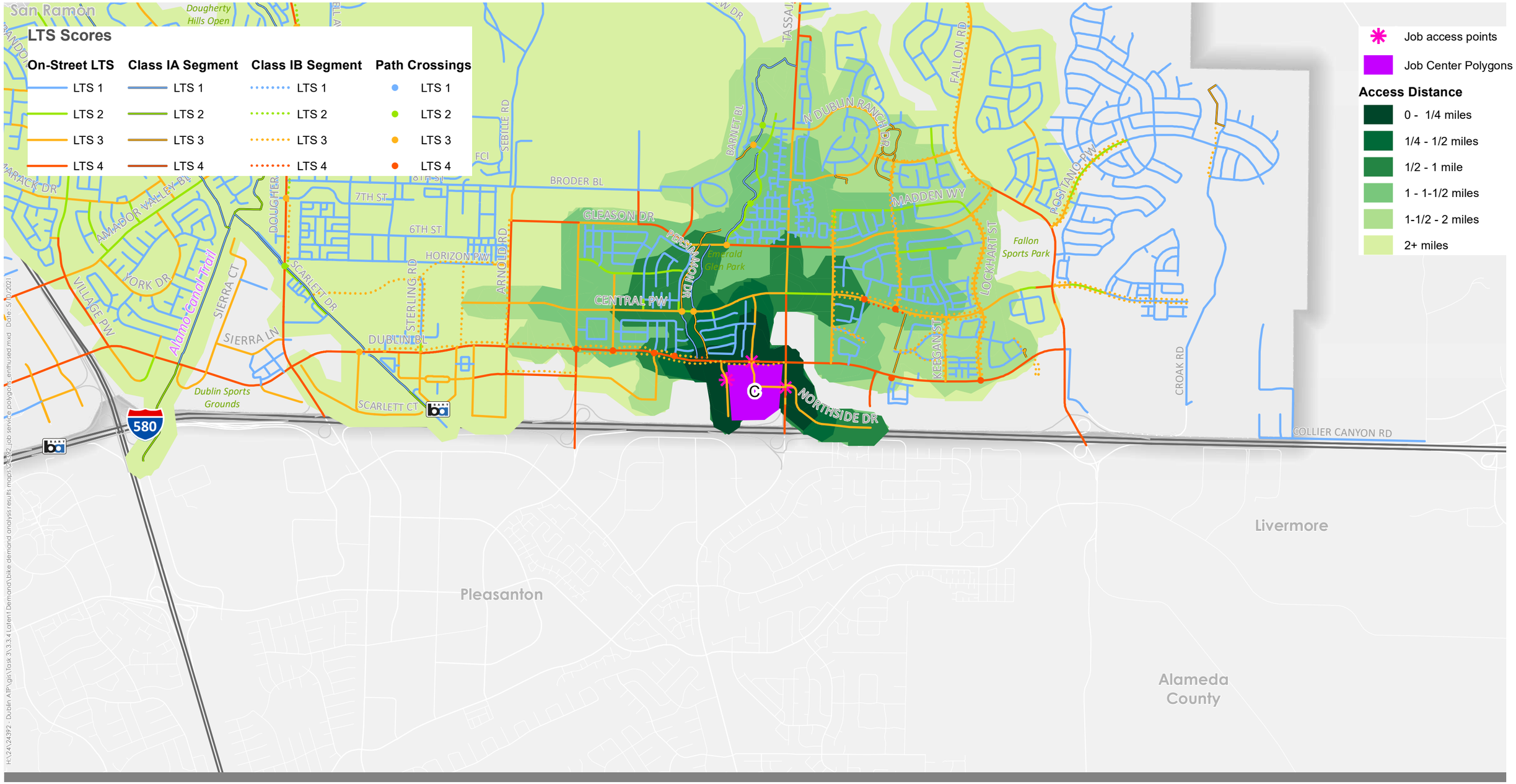

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Figure B.J.3a

**Job Center Polygon C Access - "Strong and Fearless" Network Service Area**
**Dublin, California**

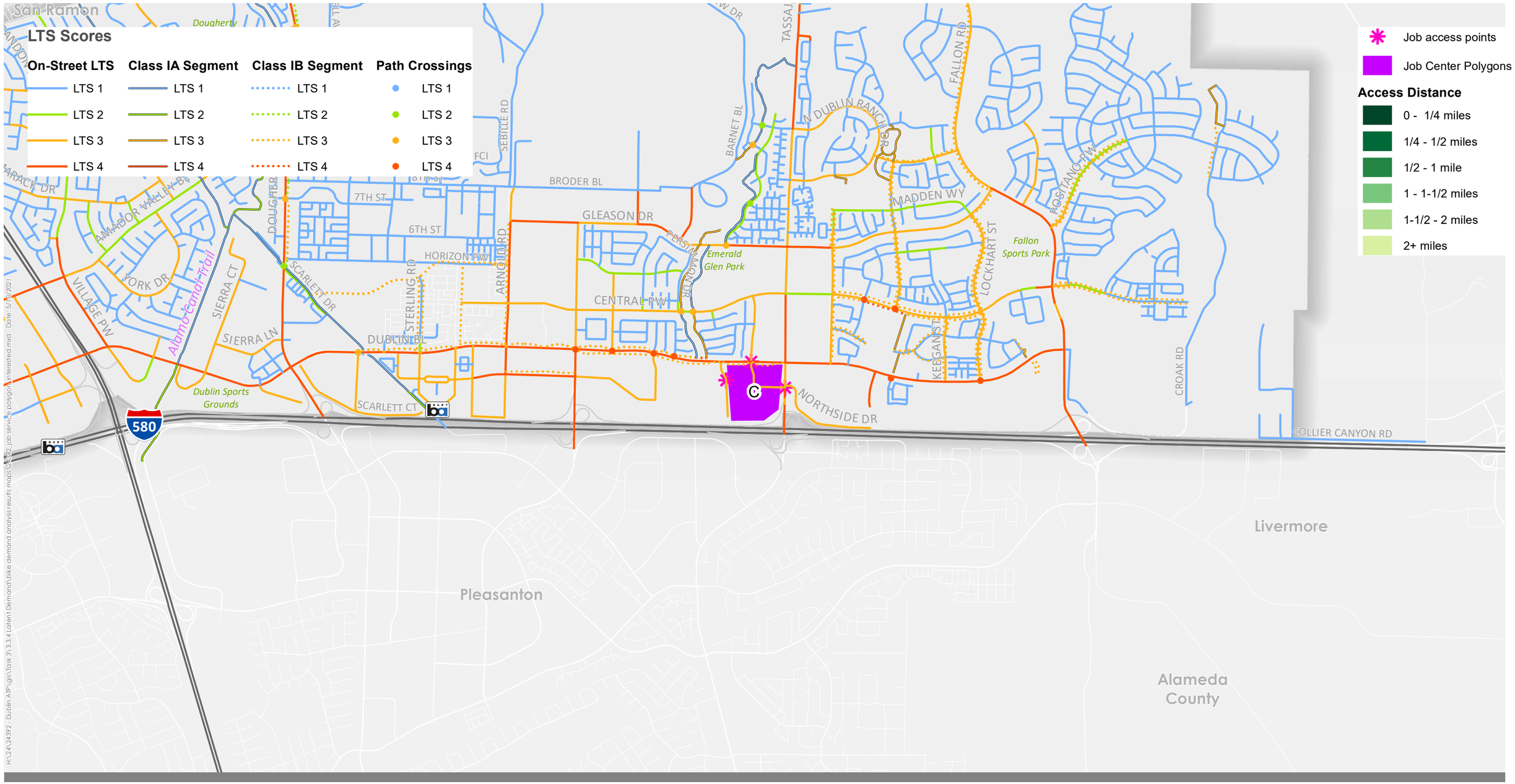



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Figure B.J.3b

**Job Center Polygon C Access - "Enthused and Confident" Network Service Area**
**Dublin, California**




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Figure B.J.3c

**Job Center Polygon C Access - "Interested but Concerned" Network Service Area**
**Dublin, California**

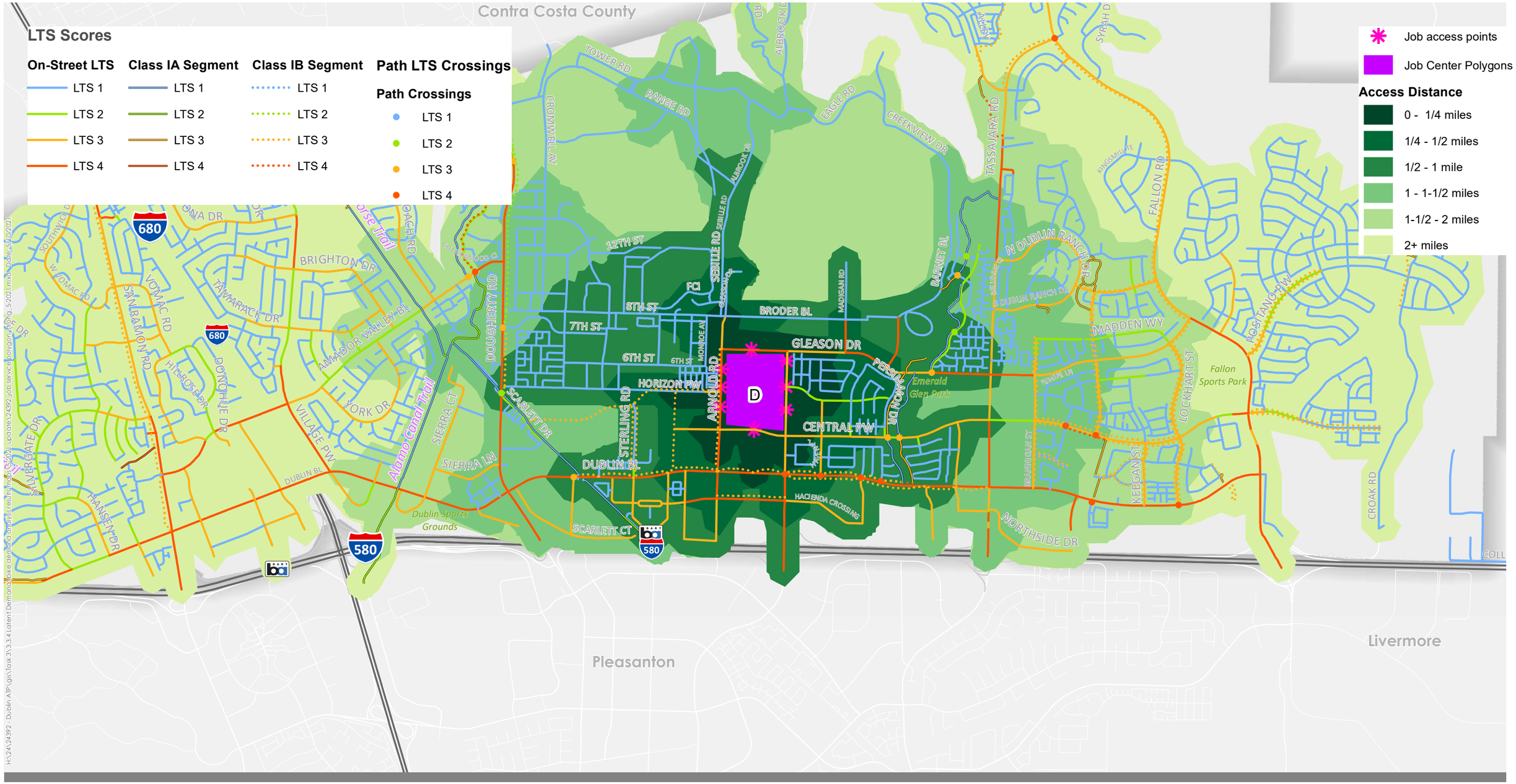
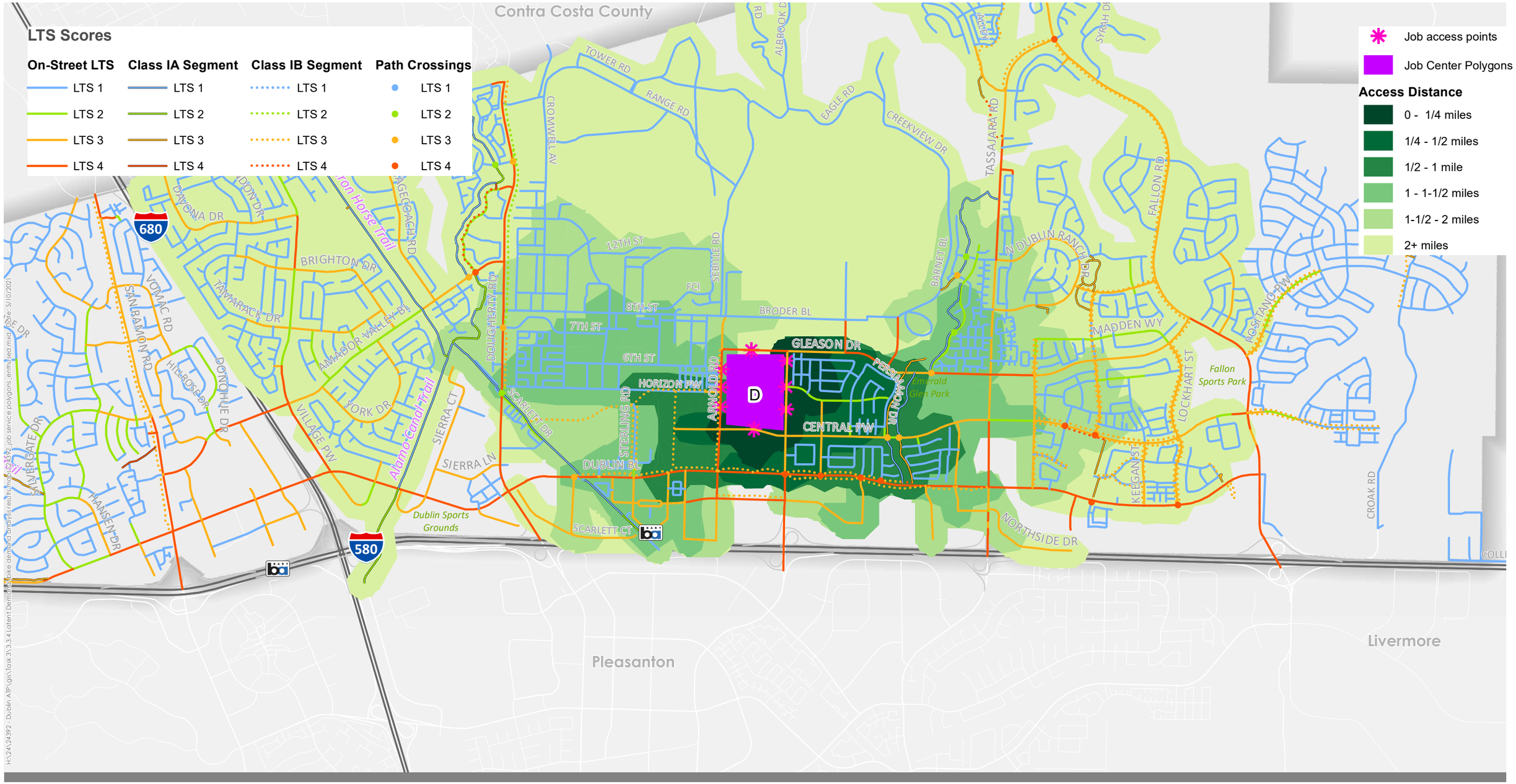



Figure B.J.4a

**Job Center Polygon D Access - "Strong and Fearless"**
**Network Service Area**
**Dublin, California**

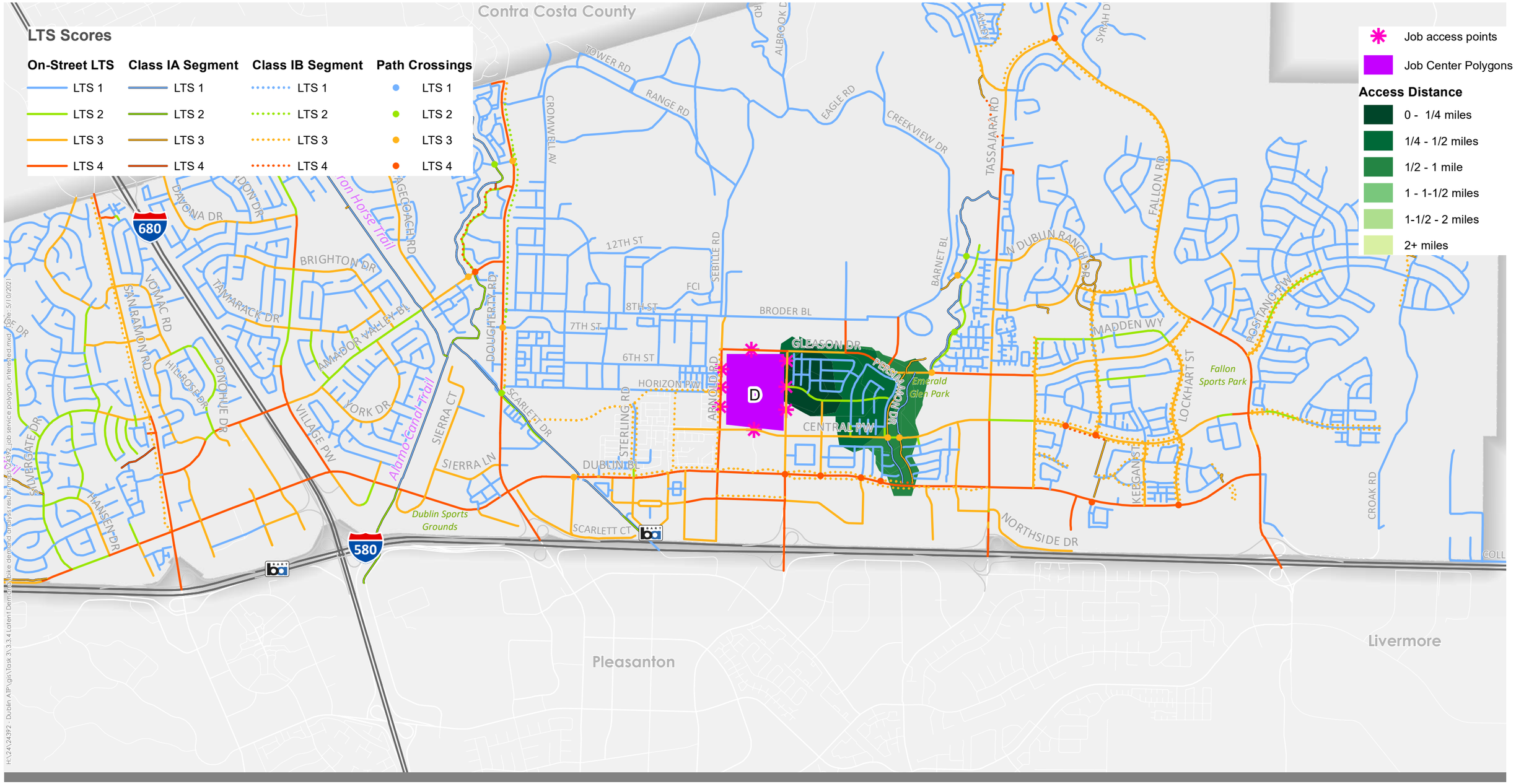



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Figure B.J.4b

**Job Center Polygon D Access - "Enthused and Confident" Network Service Area**
**Dublin, California**




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Figure B.J.4c

**Job Center Polygon D Access - "Interested but Concerned" Network Service Area**
**Dublin, California**

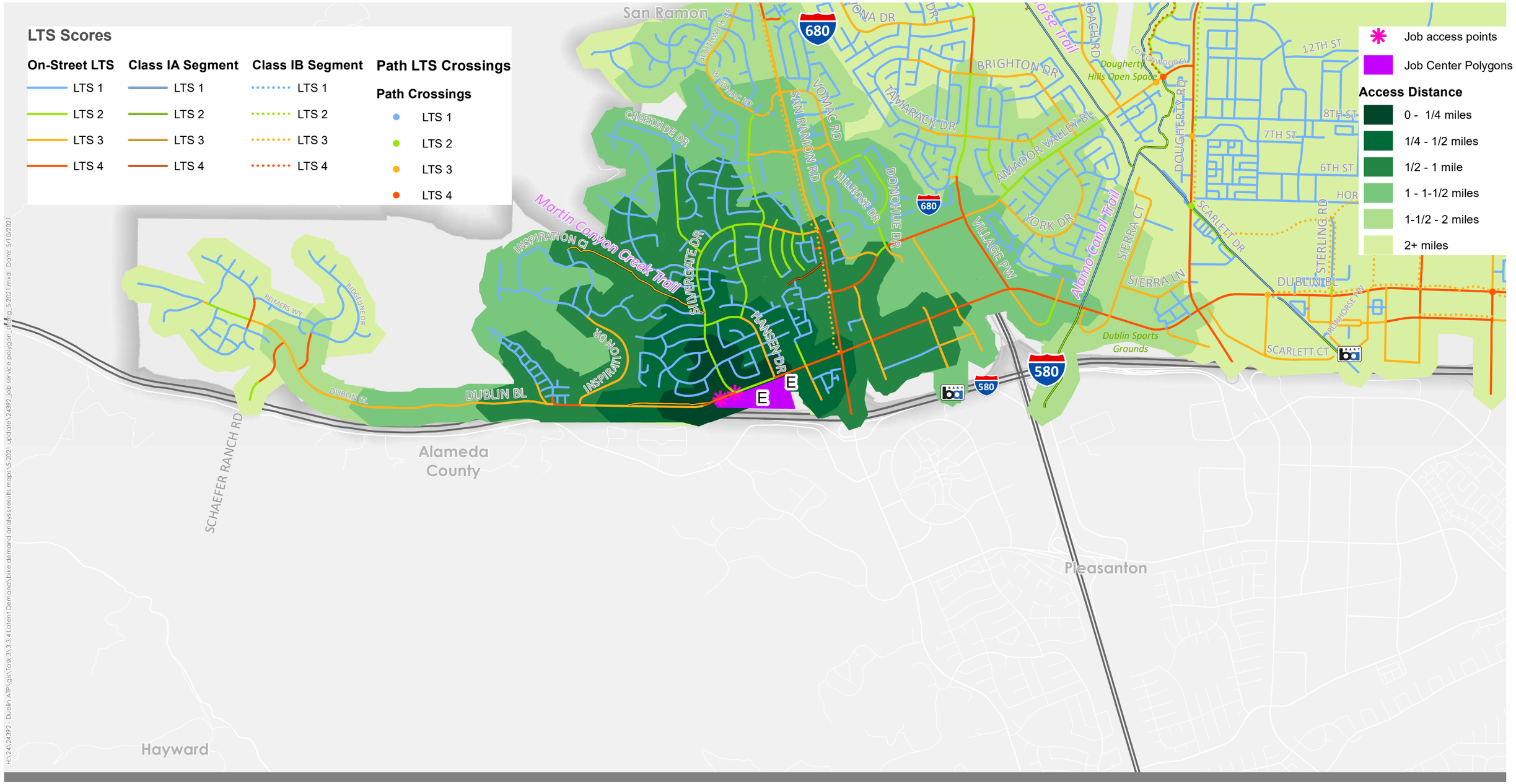
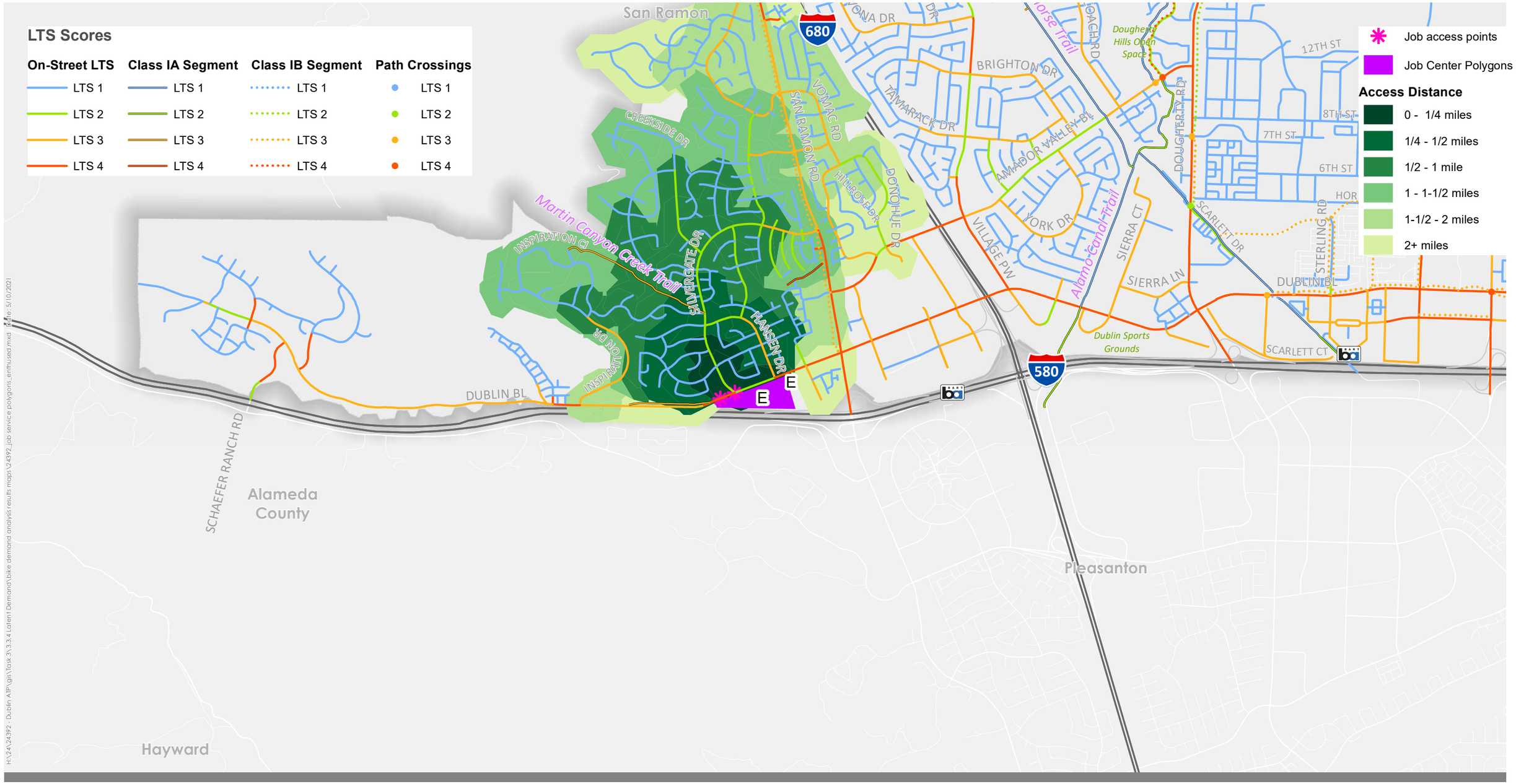



Figure B.J.5a

**Job Center Polygon E Access - "Strong and Fearless" Network Service Area**
**Dublin, California**




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Figure B.J.5b

**Job Center Polygon E Access - "Enthused and Confident" Network Service Area**
**Dublin, California**

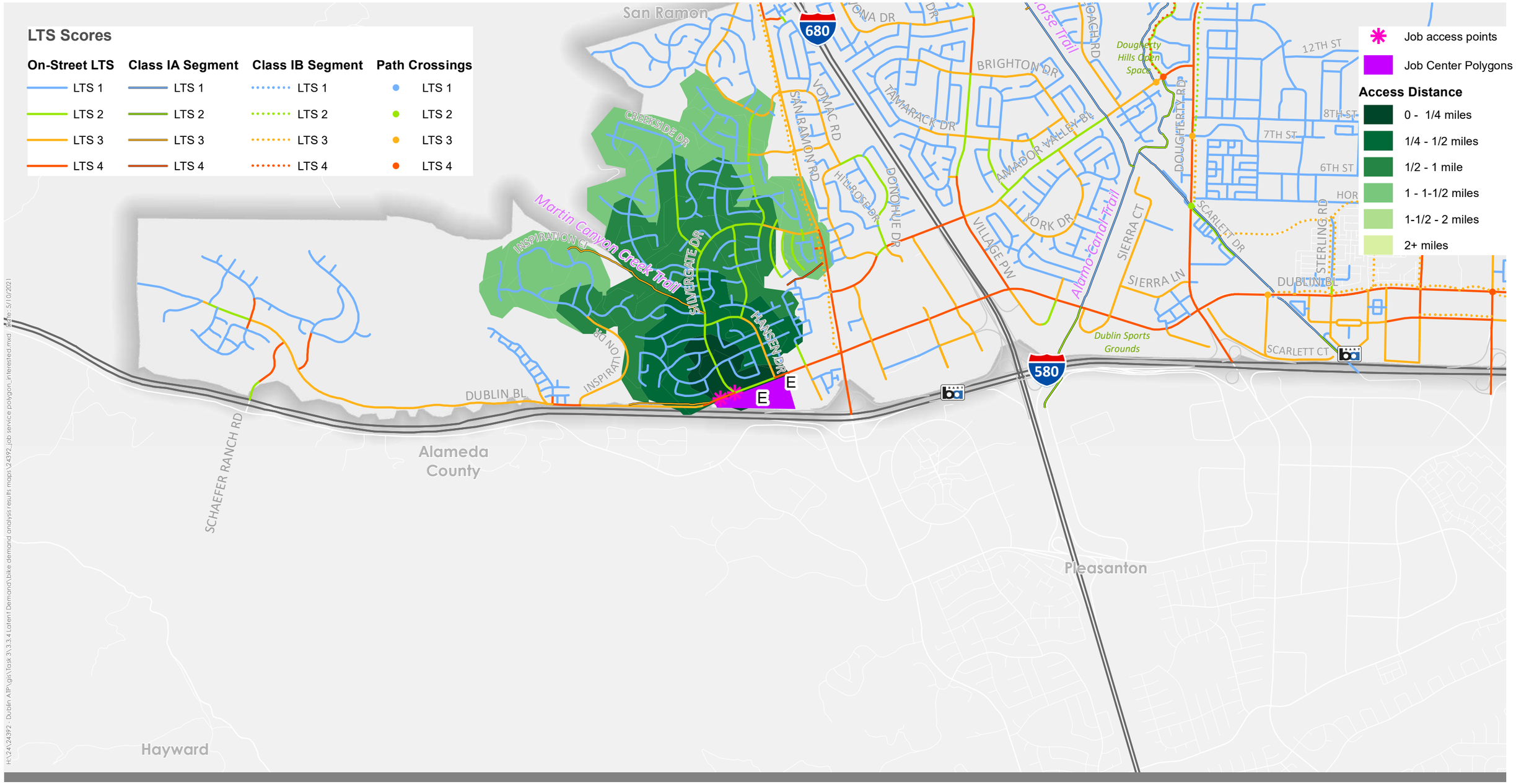
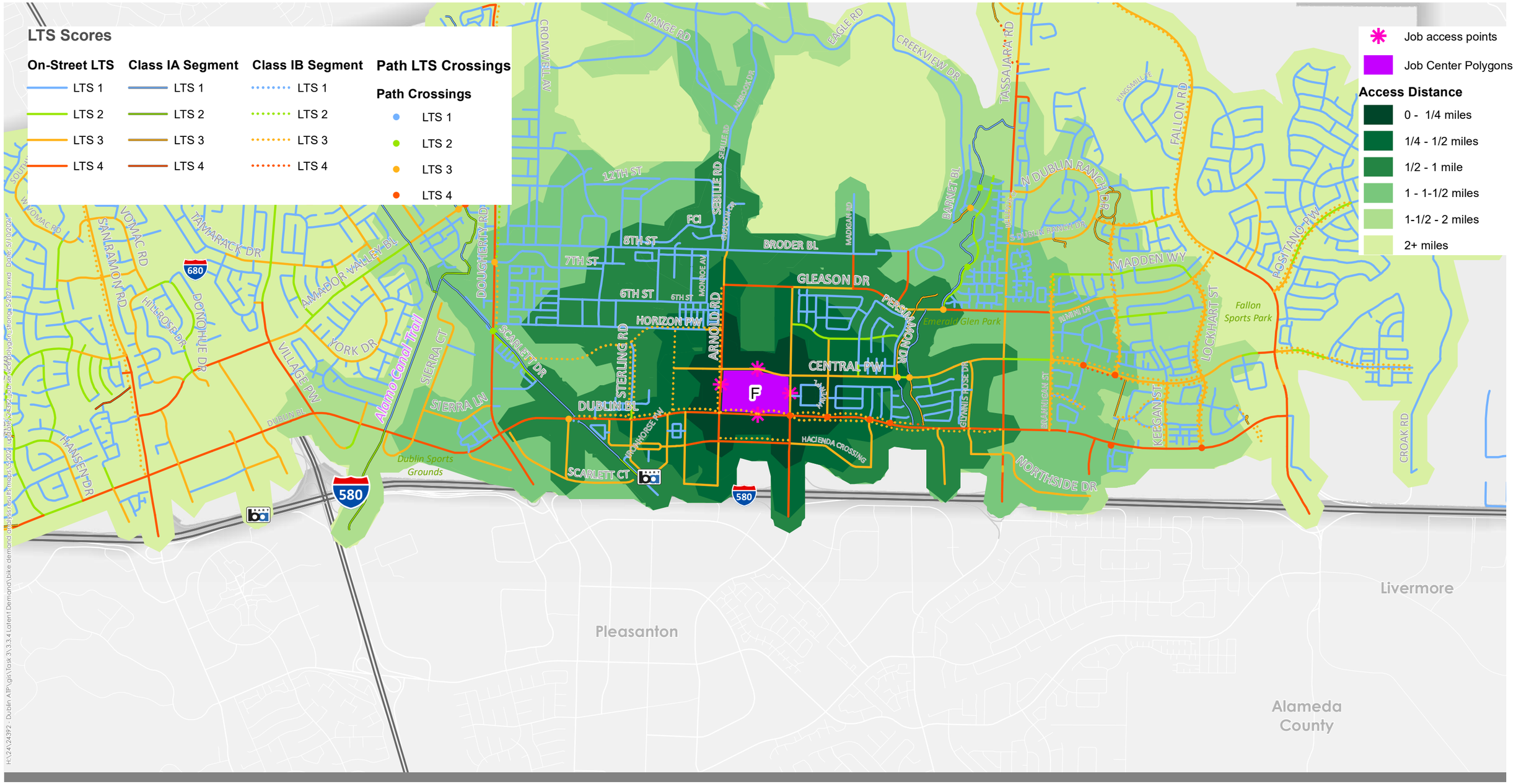



Figure B.J.5c

**Job Center Polygon E Access - "Interested but Concerned" Network Service Area**
**Dublin, California**



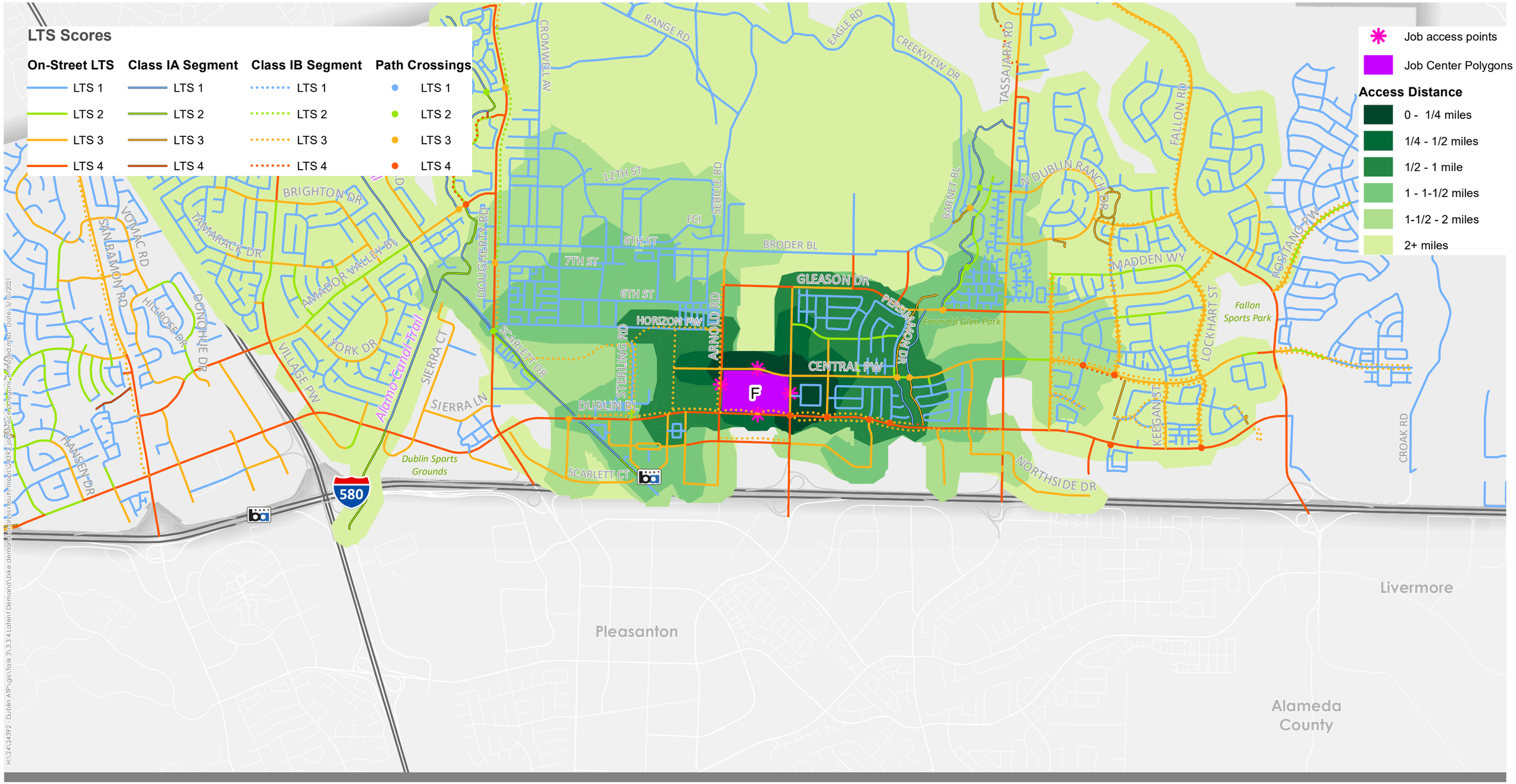



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Figure B.J.6a

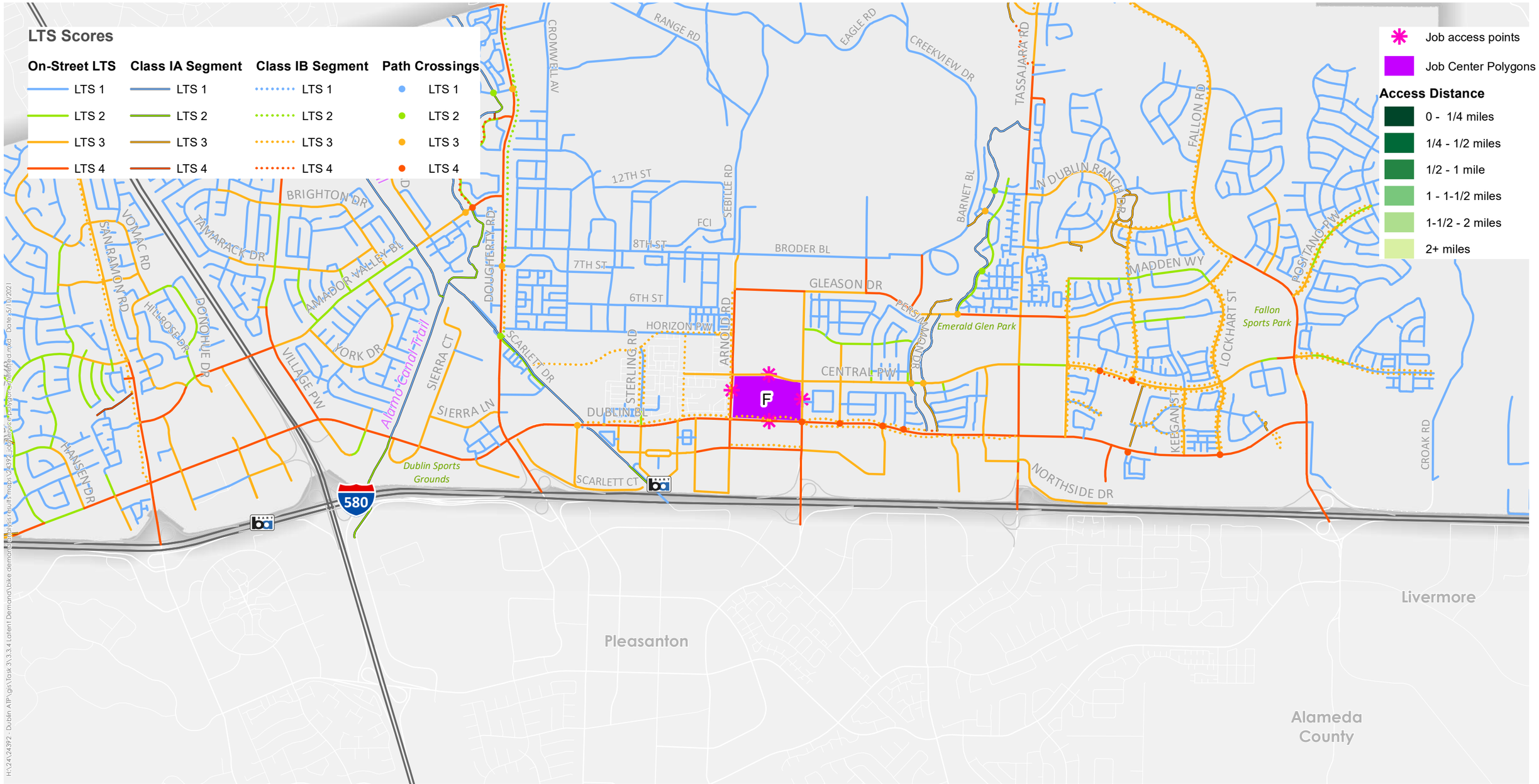
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**Dublin, California**




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Figure B.J.6b

**Job Center Polygon F Access - "Enthused and Confident"**
**Network Service Area**
**Dublin, California**



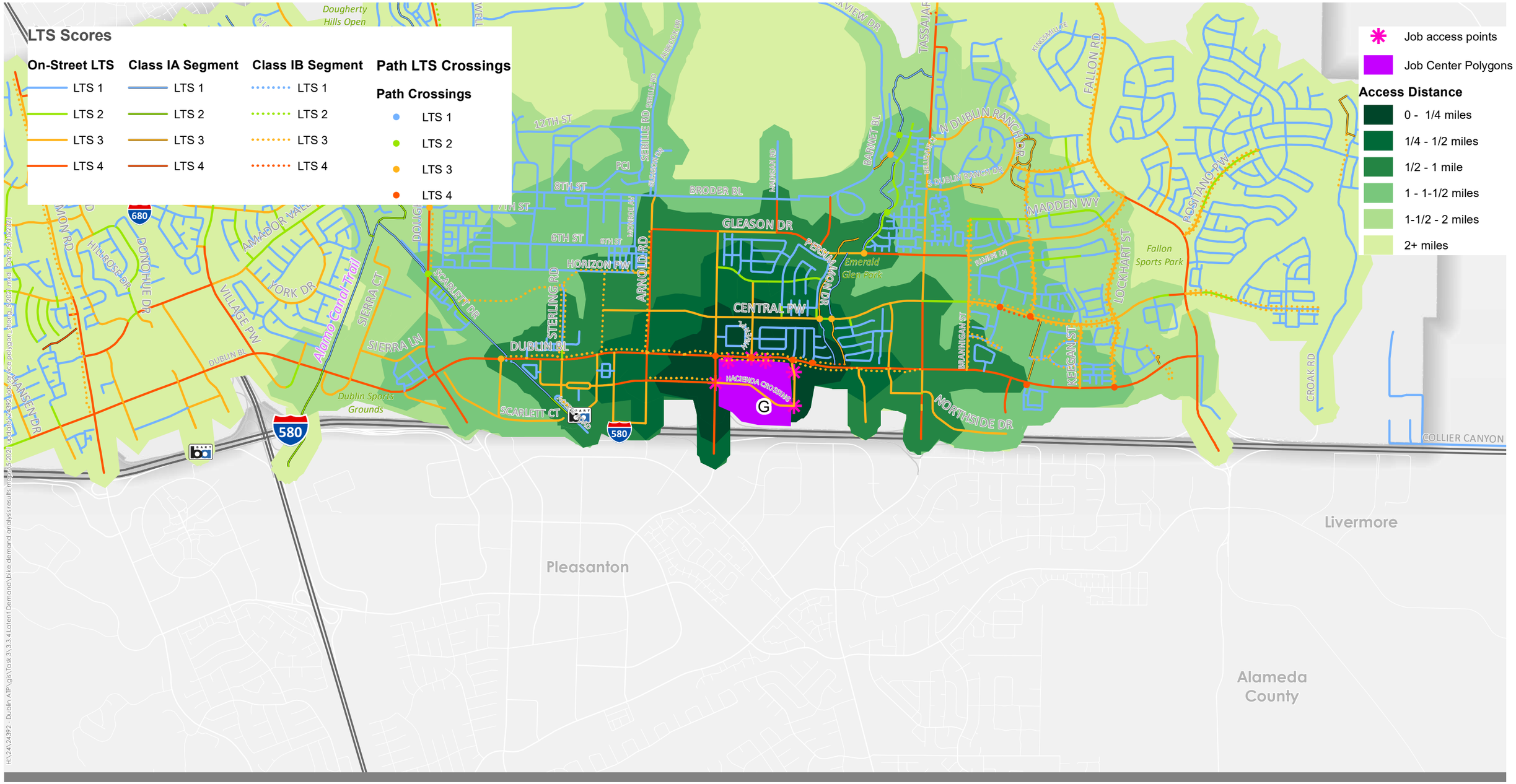

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Figure B.J.6c

**Job Center Polygon F Access - "Interested but Concerned" Network Service Area**
**Dublin, California**



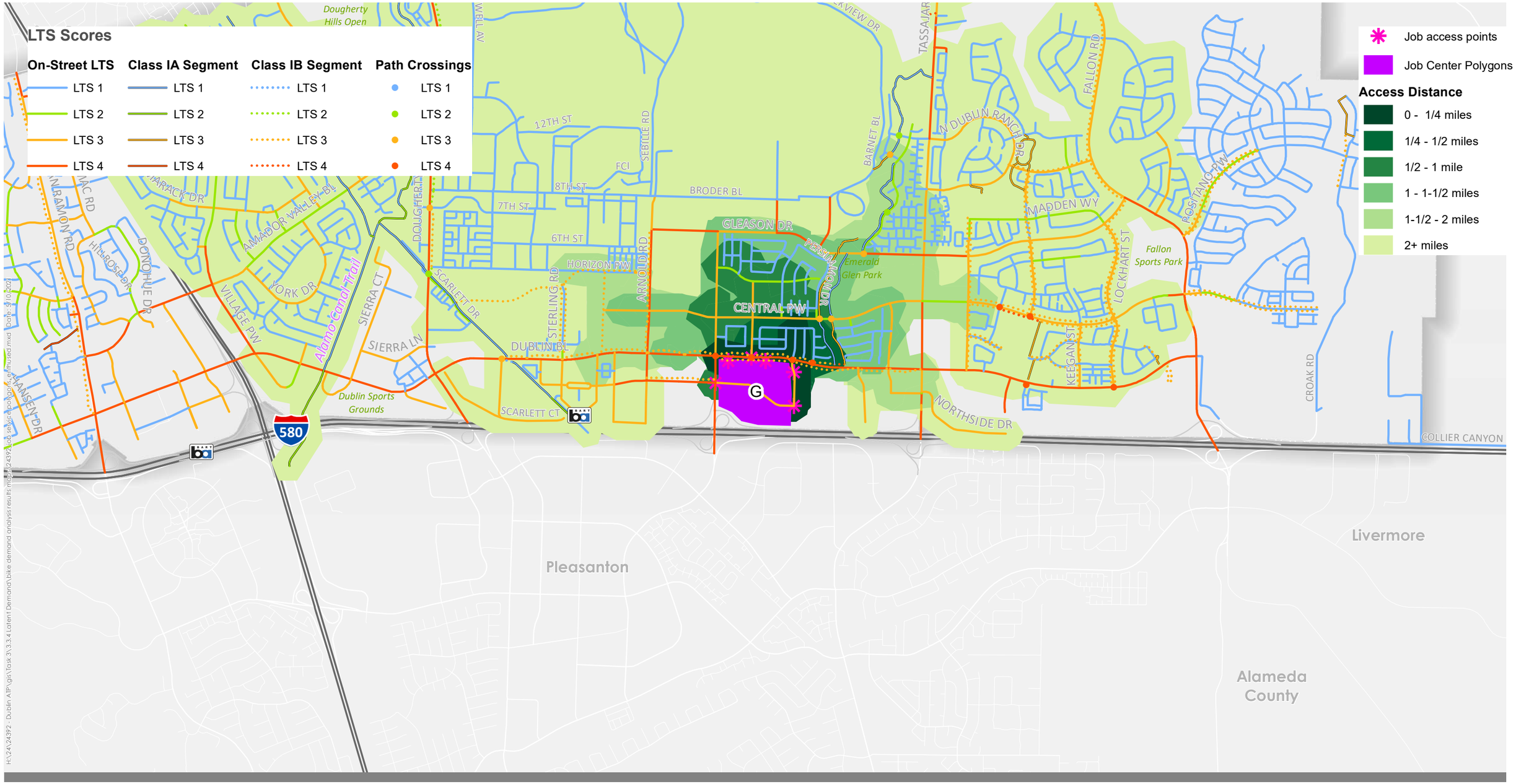

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Figure B.J.7a

**Job Center Polygon G Access - "Strong and Fearless" Network Service Area**
**Dublin, California**



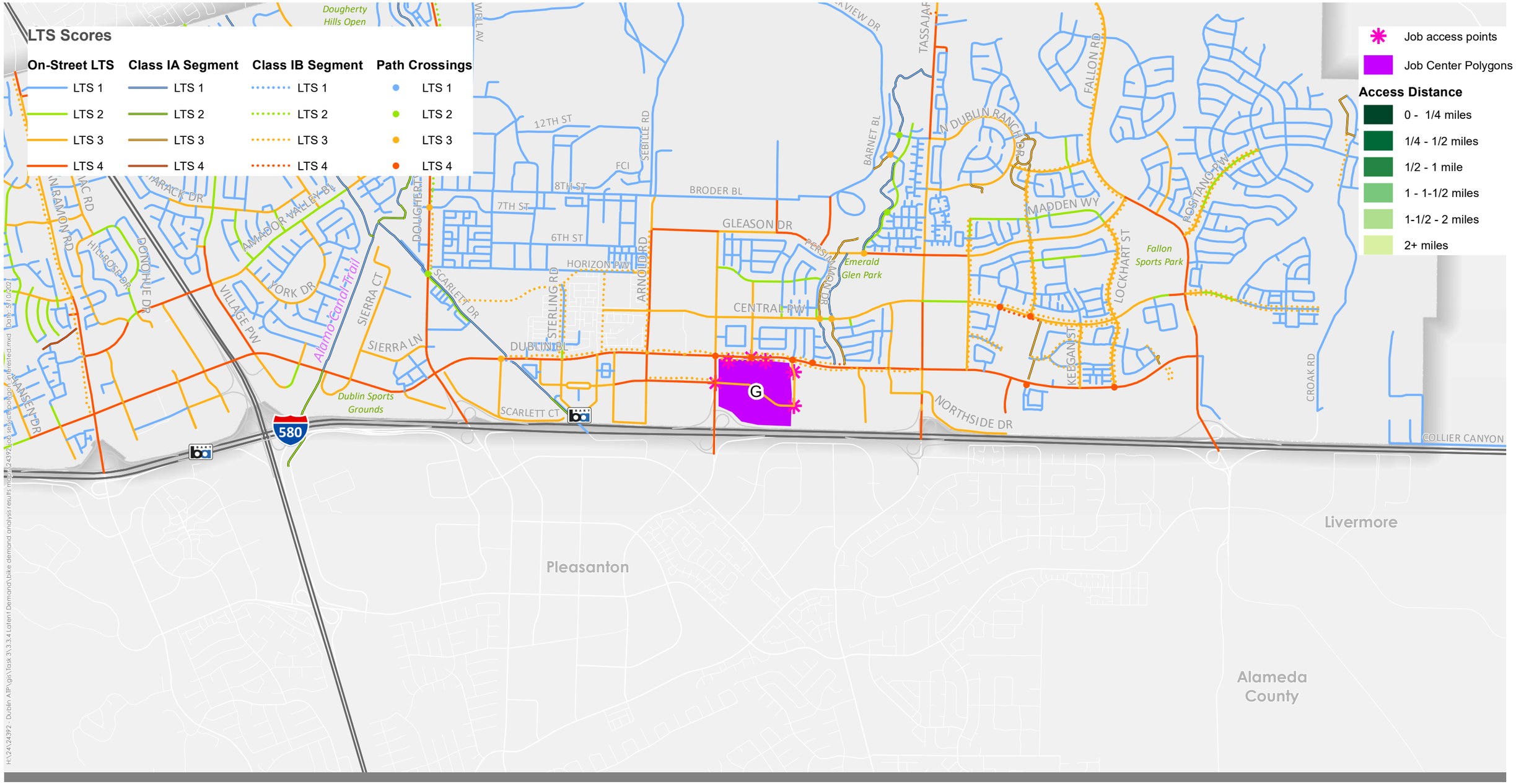

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Figure B.J.7b

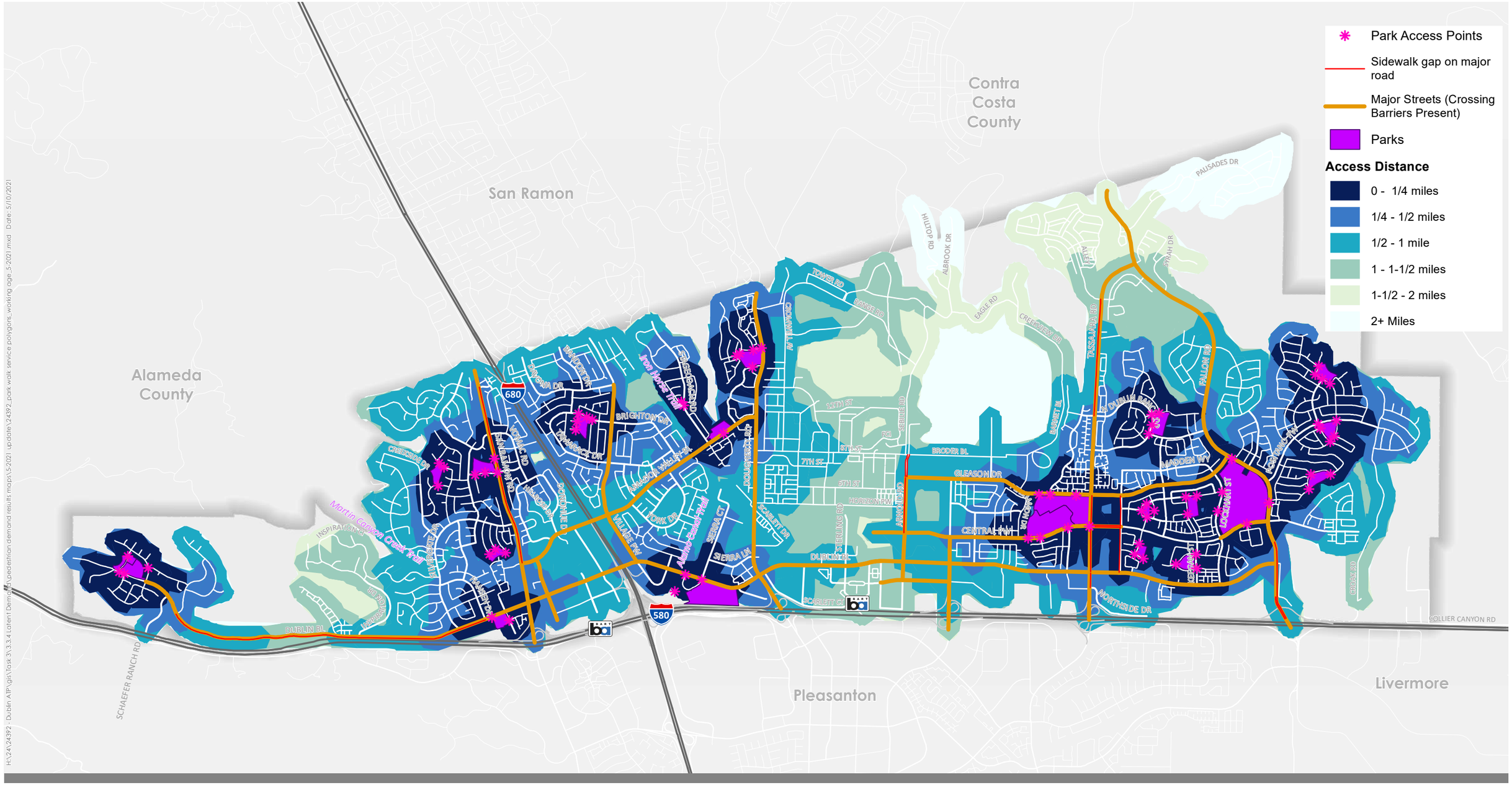
**Job Center Polygon G Access - "Enthused and Confident" Network Service Area**
**Dublin, California**




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Figure B.J.7c

**Job Center Polygon G Access - "Interested but Concerned" Network Service Area**
**Dublin, California**

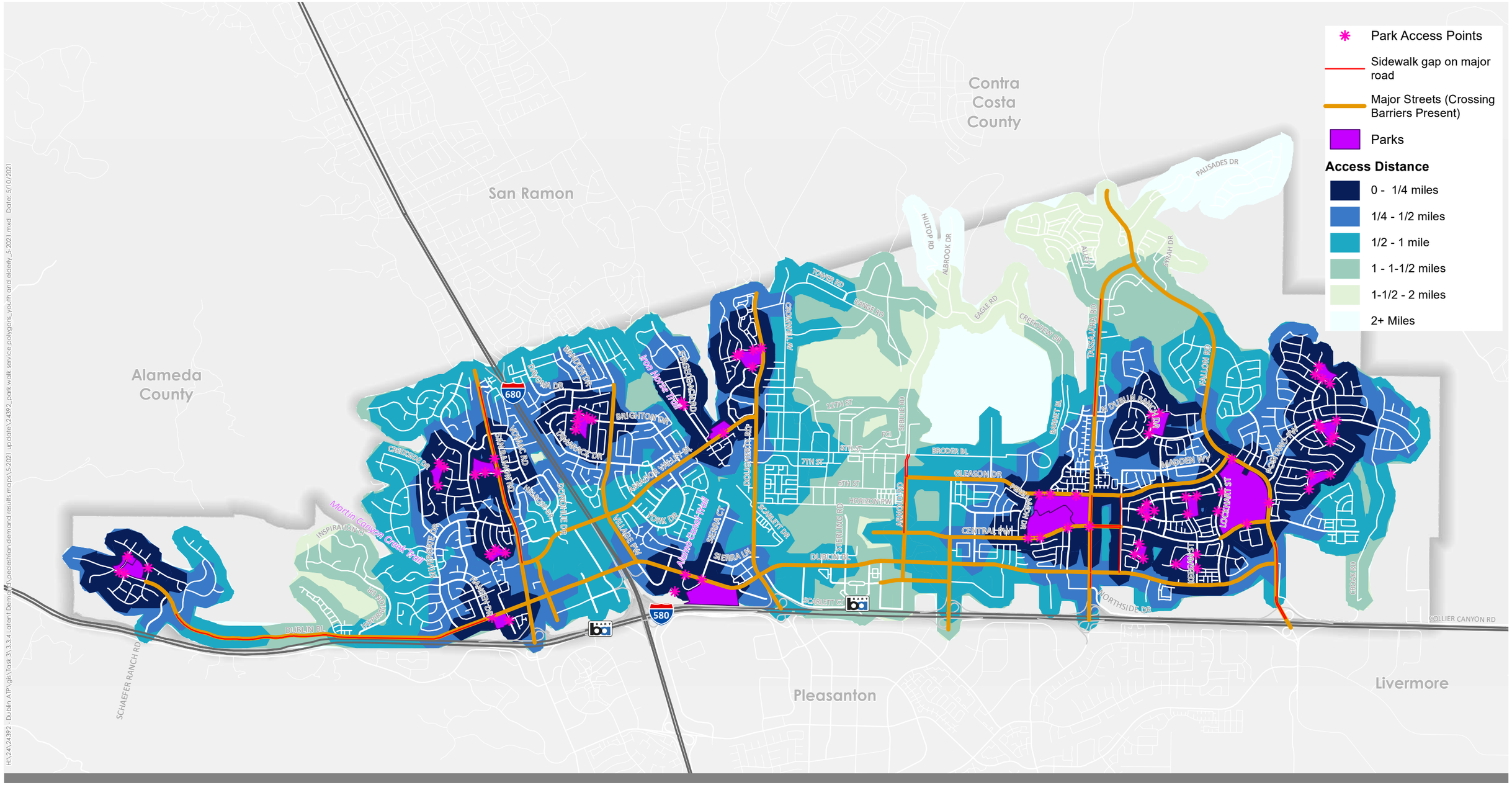



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Figure W.P.1

**Park Network Service Areas: Walking Perceived Distances**
**Neighborhood and Community Parks - 14 to 55 Years Old**
**Dublin, California**



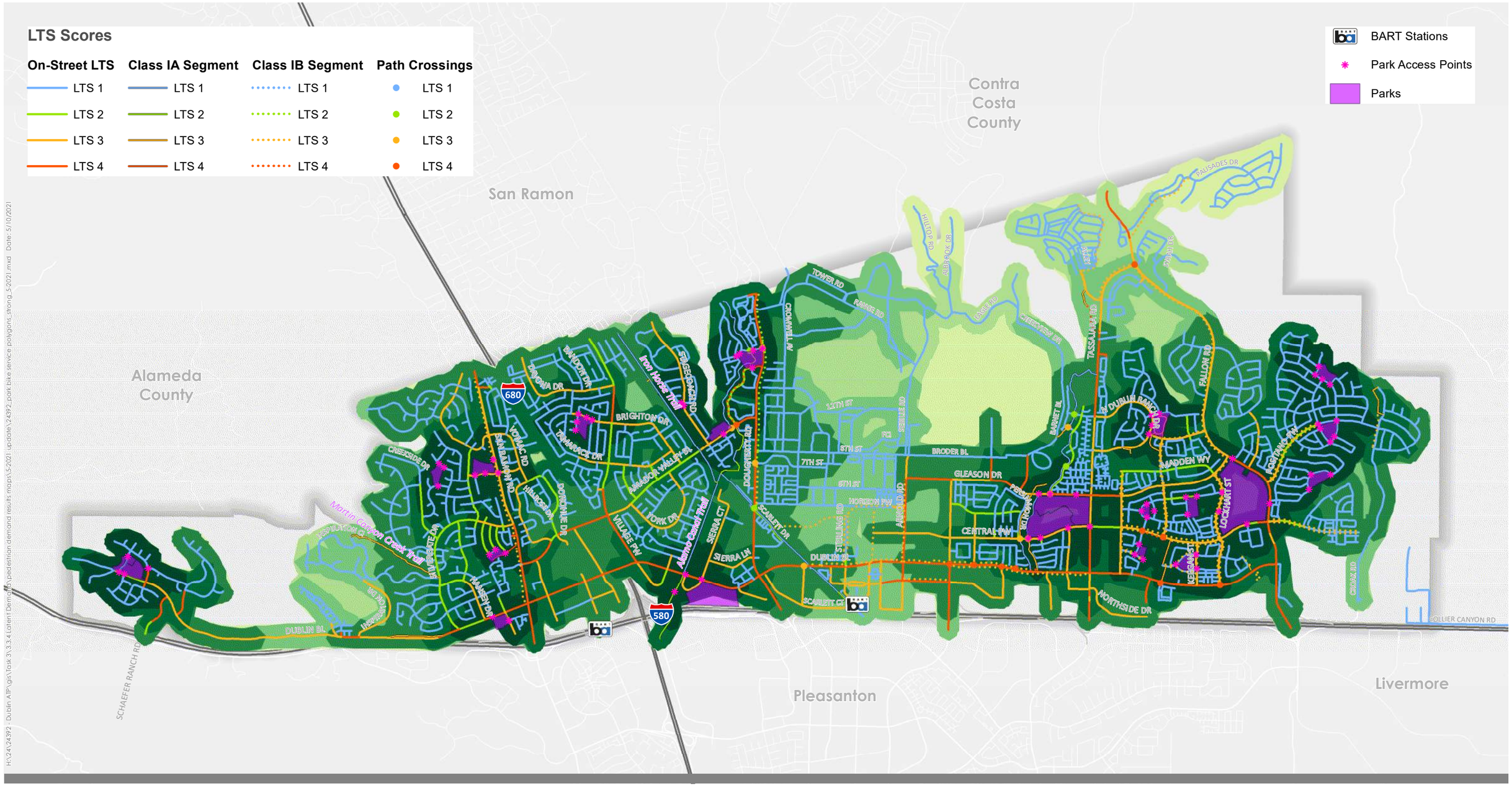

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Figure W.P.2

**Park Network Service Areas: Walking Perceived Distances**
**Neighborhood and Community Parks - Under 14 and Over 55 Years Old**
**Dublin, California**

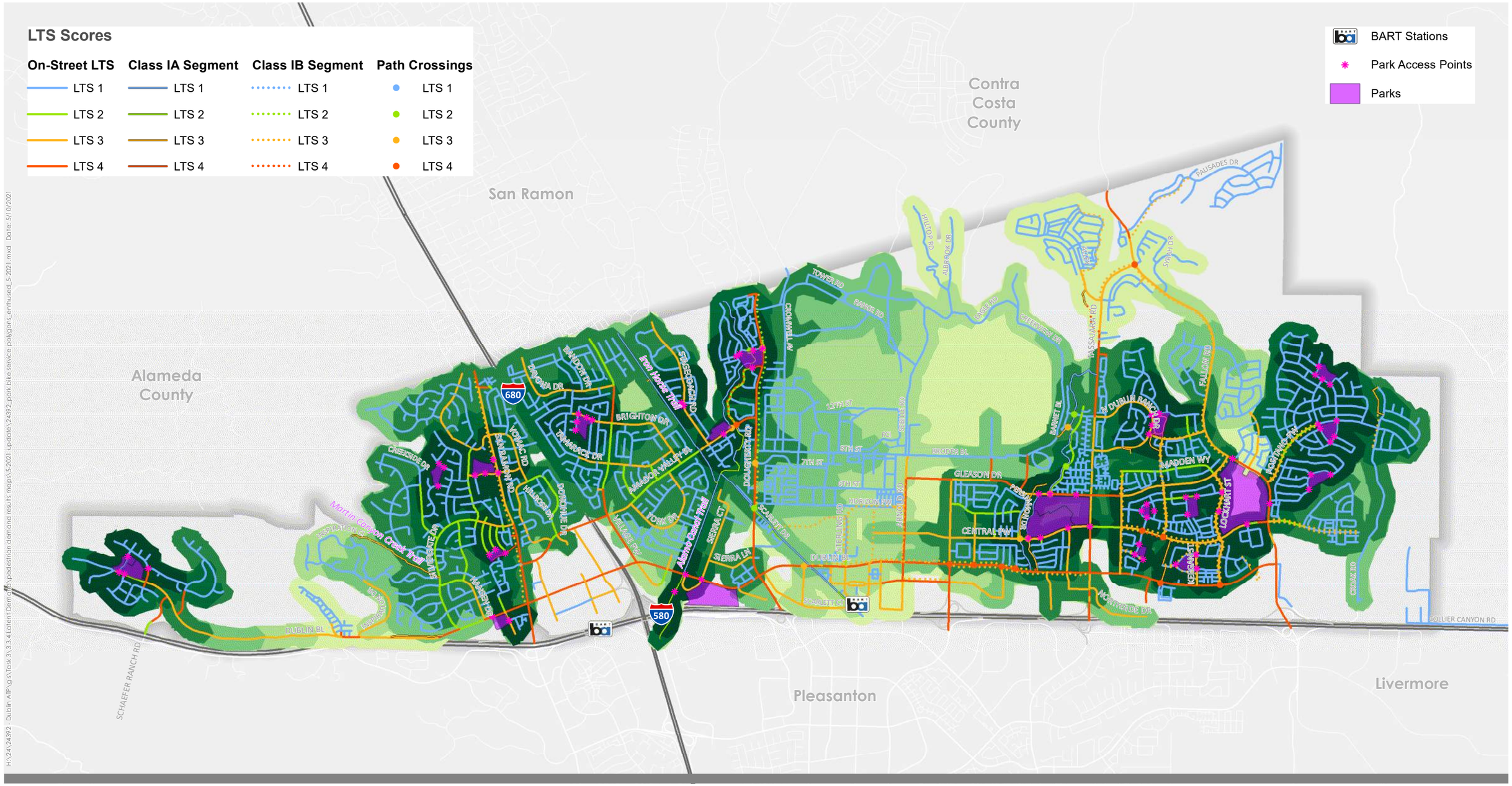



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Figure B.P.1

**Parks - "Strong and Fearless" Network Service Area**
**Dublin, California**



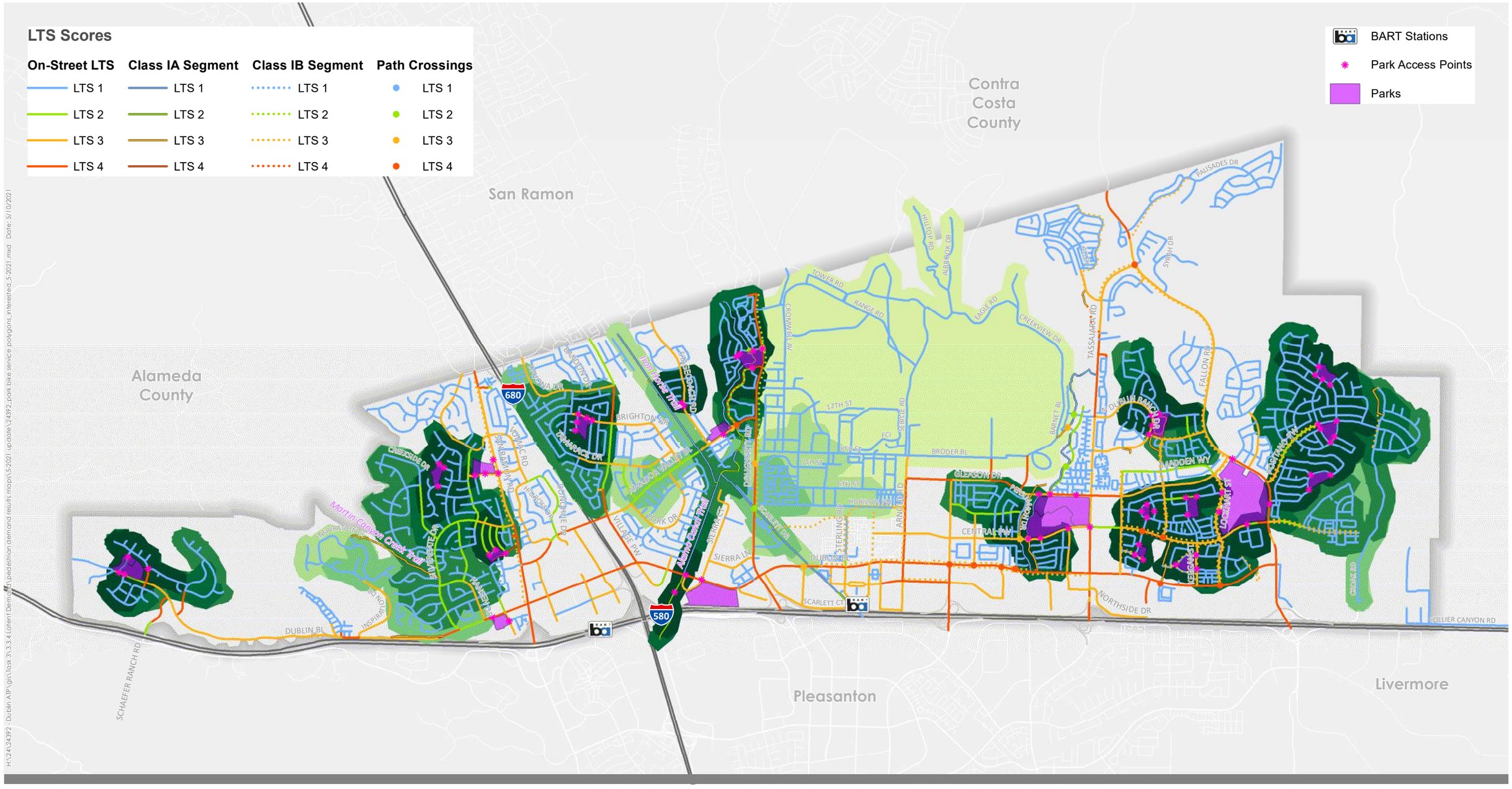

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Figure B.P.2

**Parks - "Enthused and Confident" Network Service Area**
**Dublin, California**




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Figure B.P.3

**Parks - "Interested but Concerned" Network Service Area**
**Dublin, California**

# APPENDIX C

# NETWORK RECOMMENDATIONS: PRIORITIZATION FRAMEWORK

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# MEMORANDUM

Date: May 20, 2021 Project #: 24392

To: Sai Midididdi, TE
City of Dublin

From: Amanda Leahy, AICP; Mike Alston, RSP, Camilla Dartnell

Project: Dublin Bicycle and Pedestrian Master Plan

Subject: Draft Prioritization Framework

## INTRODUCTION

The City of Dublin Bicycle and Pedestrian Master Plan Update (Plan) will provide recommendations and an implementation framework to support the maintenance and improvement of bicycle and pedestrian infrastructure, policies, and programs in the City. Planned infrastructure improvements should connect users with key destinations – schools, transit connections, parks, trails, and commercial destinations including job centers—within the City and in adjacent jurisdictions. A spatial evaluation and prioritization of roads and paths in the City can determine which can provide the greatest potential benefit to help meet Plan goals.

This memorandum outlines the process for this prioritization. This memorandum includes the following sections:

- Prioritization Process
- Proposed Factors and Variables
- Public Input
- Factor Weights
- Criteria Scaling
- Criteria Methodology

The process outlined in this memorandum will produce evaluation scores for roadway segments for each variable identified. The factor weights outlined in this memorandum will then be applied and each segment will receive one combined evaluation score, allowing for comparison of every roadway and path segment in the City.

The evaluation scores will provide an understanding of the priority of each segment based on the selected factors but will not consider feasibility or constructability. During post processing, the team will identify general trends in the prioritization scores and consider context to "smooth" the results into project corridors. Feasibility and constructability will be considered in subsequent Tasks 4.2, *Identify Network Recommendations* and 4.4, *Develop Implementation Plan,* during the project creation process.

## PRIORITIZATION PROCESS

The proposed evaluation process is informed by the framework from NCHRP Report 803: ActiveTrans Priority Tool[1] (APT), the result of a national research effort. The APT methodology was based on an extensive review of existing prioritization processes being used by agencies across the country at the state, regional, and local level. It uses a standard set of terms and definitions to describe the different steps in the process. The following definitions apply within the APT:

- **Factors** are the categories used to express community or agency values considered in the prioritization process and contain groups of variables with similar characteristics. The APT has selected nine primary factors commonly used by agencies across the country that are particularly suited for prioritization of active transportation needs.
- **Weights** are the numbers used to indicate the relative importance of different factors based on community or agency values. In order to increase transparency and legibility in the weighting step, weights are applied to factors, not to variables (which are often much more technical in nature).
- **Variables** are characteristics of roadways, households, neighborhood areas, and other features that can be measured, organized under each factor. The terms *variables* and *evaluation criteria* may be used interchangeably.
- **Scaling** is the process of making two variables comparable to one another (e.g., number of collisions versus population density.)

The APT outlines the 10-step process (described below) in two phases:

- **Scoping**, (steps 1-6) in which the prioritization purpose is established, factors and variables are selected, and data resources are assessed; and
- **Prioritization,** (steps 7-10) in which data is organized, scaling is applied, and prioritization scores are calculated.

[1] Lagerwey, Peter A., et al. *Pedestrian and Bicycle Transportation Along Existing Roads—ActiveTrans Priority Tool Guidebook*. NCHRP Report 803. Project No. 07-17. 2015. Available online at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_803.pdf

The process is often iterative, as agencies may find a need to substitute variables if they find a lack of data availability.

The Steps are listed in Table 1.

**Table 1: Prioritization Steps**

| Phase | Step |
|---|---|
| Scoping | Step 1: Define Purpose |
| | Step 2: Select Factors |
| | Step 3: Establish Weights |
| | Step 4: Select Variables |
| | Step 5: Assess Data Availability |
| | Step 6: Assess Technical Resources |
| Prioritization | Step 7: Set up Prioritization Tool |
| | Step 8: Input Data |
| | Step 9: Scale the Variables |
| | Step 10: Calculate Priority Scores |

Source: NCHRP Report 803

Although all steps in this 10-step process will be performed, this memorandum focuses on **Step 2: Selecting Factors**, **Step 3: Establishing Weights**, **Step 4: Selecting Variables**, and **Step 9: Scaling the Variables.**

The team has already completed **Step 1: Define Purpose** through plan scoping, and the team has completed **Step 5: Assess Data Availability** and **Step 6: Assess Resources** through other plan development efforts so far. The recommended factors and variables have been chosen with consideration of available data and resources. **Steps 7, 8, and 10** are straightforward spreadsheet exercises that implement the decisions documented in this memorandum in the spreadsheet.

### Step 1: Define Purpose

An agency first determines the purpose of the prioritization. In this step, an agency selects the mode they would like to prioritize; decides whether they are prioritizing specific projects, generalized needs, or something between the two; and defines the extent and number of the improvement locations.

*For the Plan, the process will be applied separately for bicycle and pedestrian modes along roadway segments and off-street segments like paths. Paths will be included in both bicycle and pedestrian modes. The process prioritizes generalized needs, which will result in each segment receiving its own score. The team will use that score to inform selection of corridors for improvement during post processing.*

### Step 2: Select Factors

An agency next selects the factors to be used in prioritization that align with their goals for the prioritization process. The factors included in the APT are as follows:

1. Stakeholder input;
2. Costs and/or legal constraints;
3. Opportunities;
4. Safety;
5. Existing conditions;
6. Demand;
7. Connectivity;
8. Equity; and
9. Compliance with standards/plans.

Agencies can select anywhere from one to nine factors in their prioritization. Depending on their prioritization purpose, some factors may be less relevant or not relevant.

*This evaluation will utilize a subset of the APT factors. Recommended factors are included in Table 2 of this document.*

### Step 3: Establish Weights

Each factor is weighted on a scale of 1 to 10 to indicate its relative importance to other factors. The selected weights are ultimately used in calculating the prioritization score. Agencies can revisit the weights at any point in the process.

*For this plan, weights are recommended to be established through a process of input from the project management team, Technical Advisory Committee, and stakeholders.*

### Step 4: Select Variables

For each selected factor, agencies can select one or more variables. Each selected factor must have at least one variable by which it is measured. Using multiple variables will decrease the relative impact of each variable for that factor in the prioritization process unless the factor weighting is also increased.

*This memorandum recommends variables in Table 2 of this document.*

### Step 5: Assess Data Availability

The availability of data is a critical consideration in determining what variables to include in a prioritization exercise, and data availability varies substantially across cities, towns, counties, MPOs, and state DOTs.

*Through the variable selection process and methodology creation, the team simultaneously performed step 5, assessing data availability, to ensure each criterion could be evaluated as proposed.*

### Step 6: Assess Technical Resources

Agencies assess their existing technical resources and capabilities to determine if existing resources are sufficient, or if new resources will be needed to complete their intended prioritization with the selected variables. In step 6, agencies also select their technological platform for performing the calculations – using the APT spreadsheet tool, a different spreadsheet, a GIS database, manual tabulation, or other method(s).

*The Plan's process will use the APT spreadsheet tool, informed by GIS-based calculations for each evaluation criterion.*

### Step 7: Set up Prioritization Tool

Having established the purpose, factors, variables and required data, the next step is to set up a tool to implement the prioritization method.

*The Plan will use the APT pre-programmed spreadsheet tool, with separate versions for each mode.[2] The raw version of the spreadsheet will be provided with this memorandum.*

[2] The spreadsheet tool is available online at http://www.trb.org/Publications/Blurbs/172459.aspx.

### Step 8: Input Data

Next, agencies input data into the prioritization tool. Depending on the variables, agencies may need to do additional calculations or assessments outside the prioritization spreadsheet tool to calculate or measure the correct value for each improvement location.

*The Plan's process will conduct a GIS-based spatial analysis to calculate values for each variable prior to inputting the data into the spreadsheet tool.*

### Step 9: Scale the Variables

Scaling involves selecting a common numeric scale and adjusting raw values to fit the common scale. Scaling should not be confused with weighting. Scaling is a more objective, technical function, while weighting is based on community/agency values. Scaling is necessary so that variables have a comparable impact on the prioritization score in the absence of weighting. Different scaling methods, such as proportional and rank order, can produce different results. Scaling methods should be chosen carefully depending on the distribution and range of the data points.

*The proposed scaling method for each variable will ultimately depend on the variable's range of calculated values, but an initial recommendation is provided for each variable in this document.*

### Step 10: Calculate Priority Scores

Finally, agencies sum the weighted values for each factor to derive a total score for each segment. The segments can then be ranked based on the prioritization score. In some cases, agencies may wish to revisit factors, variables, and/or weighting, and make adjustments to their prioritization based on additional input or evolving prioritization purposes.

*Although all steps in this 10-step process will be performed through the development of this Plan, this memorandum focuses on selecting factors, selecting variables, establishing weights, and scaling the variables. Through the variable selection process and methodology creation, the team simultaneously performed step 5, assessing data availability, to ensure each criterion could be evaluated as proposed.*

## PROPOSED FACTORS AND VARIABLES

To select prioritization factors and variables, the team reviewed NCHRP Report 803 and this Plan's goals. Table 2Table 2: Proposed Prioritization Factors and  provides a summary of the selected factors and criteria, includes brief notes, and indicates to which mode each criterion can be applied.

**Table 2: Proposed Prioritization Factors and Variables**

| Factor | Variable | Notes | Pedestrian | Bicycle |
|---|---|---|---|---|
| Safety | High-Injury Corridors | This criterion will prioritize locations based on network screening analysis of bicycle- and pedestrian-related collisions. The network screening was conducted in Task 2 of the project. This variable aligns with the goal *enhance safety.* | X | X |
| Social Equity | Youth population and senior population | Use variables from Census data at the block group level as indicators. This variable aligns with the goals *improve connectivity* and *enhance accessibility*. | X | X |
| Connectivity | Demand Analysis | Identify top bicycle or pedestrian infrastructure elements that would unlock latent demand (results of demand analysis). This variable aligns with the goal *improve connectivity.* | X | X |
| | Proximity to Schools | Identify roadways within 1 mile of schools to provide increased opportunities to bike and walk to school. This variable aligns with the goal *improve connectivity.* | X | X |
| Quality of Service | Bicycle Level of Traffic Stress | Prioritize locations based on the presence of existing high-stress riding facilities. This variable aligns with the goal *increase walking and biking.* | | X |
| | Sidewalk gaps | Identify locations with sidewalk gaps that may create barriers for those walking. This variable aligns with the goal *improve connectivity.* | X | |
| Major Barriers | Freeway crossings | Prioritize improving safety and quality of service for ramp terminal intersection and freeway crossings. This variable aligns with the goal *improve connectivity.* | X | X |
| Consistency with Past Planning | Previously identified projects | Prioritize pedestrian and bicycle projects that were identified in the previous plan. This variable aligns with the goal *prioritize investments.* | X | X |

## PUBLIC INPUT

Understanding and addressing the needs and concerns of the public is a key step in creating a successful plan representative of the needs and values of the community. The nature of the public feedback requires qualitative integration into the project. After the quantitative analysis is complete through the application of the evaluation criteria identified above, the team will perform a "smoothing" process to identify the overall future walking and biking corridors that form the basis for project identification. During this process, the team will refer to the public input and the quantitative evaluation in determining which areas are priority corridors and where those corridors start and end.

## FACTOR WEIGHTS

Factor weights allow different factors to be given different emphasis in the prioritization process. Factors that are deemed to be more important may be given higher weight than other factors to create this emphasis in the scoring process. Scaled variable scores are averaged for each factor and multiplied by the factor weight to get the final prioritization score for each segment.

For this plan, weights are recommended to be established through a process of input from the Technical Advisory Committee and the public. Input received from each group will be averaged to get a recommended set of weights for each group (Project Management Team, Technical Advisory Committee, and the public). These will then be averaged to determine the overall final weighting to be applied.

**Table 3: Example Factor Weights**

| Factor | Variables | Equal Weights | Other Options |
|---|---|---|---|
| Safety | High-Injury Corridors | 10 | Averaged weights from Project Management Team, Technical Advisory Committee, and the public |
| Social Equity | Youth and senior populations | 10 | |
| Connectivity | Demand Analysis | 10 | |
| | Proximity to Schools | 10 | |
| Quality of Service | Bicycle Level of Traffic Stress | 10 | |
| | Sidewalk Gaps | | |
| Major Barriers | Freeway crossings | 10 | |
| Consistency with Past Planning | Previously identified projects | 10 | |

# SCALING

NCHRP Report 803 provides guidance on adjusting raw values for a given variable (criterion) to fit a common scale. There are multiple ways to adjust the values to fit the scale, depending on the distribution of the data and relative importance of the values. NCHRP Report 803 distinguishes the adjustment methods based on their appropriateness for addressing outliers. Two primary methods will be used in this project to adjust raw values to fit the selected common scale of 0 to 10. Each is described below. Scaling should be refined when evaluation scores are received depending on the range of scores, but a preliminary recommendation for scoring each criterion is included in the Proposed Methodologies section of this document.

Each scaling mechanism has an associated inverse scaling mechanism, where the same scoring method is applied but the scaling considers lower scores as having a higher scaled value. An example of when this may be applied is when a roadway segment near an essential destination should be prioritized over one far from an essential destination, and the evaluation is being performed based on distance to the destination. An inverse scaling mechanism can be used to provide higher scaled values to those with shorter distances and lower raw input values than those farther away.

### *Proportionate and Inverse Proportionate Scaling*

- Appropriate for data without outliers.
- Raw values are adjusted proportionately to fit the common scale.
- The highest value in the common scale is assigned to the highest raw value and the lowest value in the common scale is assigned to the lowest raw value. The raw values in between are scaled proportionately based on their relationship to the highest and lowest raw values.
- $Y = (X - MIN)/(MAX - MIN) \times S$, where Y is the scaled value, X is the raw value, MIN is the minimum raw value, MAX is the maximum raw value, and S is the scale.
- Zero values may be excluded and assigned a value of zero or included in the calculation and scaled.

### *Rank Order Scaling and Inverse Rank Order Scaling*

- Appropriate for data with outliers.
- Raw values are ranked and then scaled proportionately to fit the selected scale.
- Zero values may be excluded and assigned a value of zero or included in the calculation and scaled.
- Example from NCHRP 803:

**Table 29. Example of rank scaling.**

| Raw Value | Rank | Scaled Value |
|---|---|---|
| 0 | 1 | 0 |
| 0 | 1 | 0 |
| 0 | 1 | 0 |
| 0 | 1 | 0 |
| 5 | 2 | 2 |
| 7 | 3 | 4 |
| 9 | 4 | 6 |
| 10 | 5 | 8 |
| 32 | 6 | 10 |

*Note: In this example, the minimum raw value is 0 and the maximum raw value is 32. 32 is also an outlier, since it is more than three times larger than the next highest raw value. To address this, the values are ranked from low to high (i.e. the lowest value gets a rank of 1, next lowest value gets a rank of 2, and so on). The ranked values are then scaled proportionately.*

### *Quantile Scaling and Inverse Quantile Scaling*

- Appropriate for data with outliers.
- Raw values are grouped into equal groups with the same number of values and then those groups, or quantiles, are scaled proportionately to fit the selected scale

### *Non-Linear Scaling and Inverse Non-Linear Scaling*

- Not appropriate for data with outliers.
- Appropriate when the importance of raw numeric values increases in a non-linear fashion

# PROPOSED METHODOLOGIES

This section provides details and outlines the methodologies and recommended scaling for applying each evaluation criterion.

## Safety: High-Injury Corridors

| Variable | High-Injury Corridors |
|---|---|
| **Factor** | Safety |
| **Description** | The team conducted a collision analysis in Task 3 of this plan production to identify the high injury network based on collision history and trends. The team evaluated bicycle and pedestrian involved crash data from 2014 through 2019 on public streets within the city, excluding freeways, using an Equivalent Property Damage Only (EPDO) analysis. This EPDO analysis considered fatal and severe injury collisions to be worth 10 equivalent PDOs, moderate and minor injury collisions to be worth 5 equivalent PDOs, and PDO collisions to be worth 1 equivalent PDO. The team then selected approximately the top 10 percent of roadways to be included in the high injury network as high injury corridors. |
| **Data Needs** | Bicycle and pedestrian high injury network results |
| **Same method for pedestrian and bicycle?** | The same methodology will be used for the bicycle and pedestrian analysis, but due to different pedestrian and bicycle equivalent PDO scores, results for each mode may be different. |
| **Proposed Methodology** | The EPDO analysis scores will be applied to each roadway segment in the City. For paths that intersect roadways, each path will be given the score equivalent to the intersecting roadway, for a half mile segments around the intersection. |
| **Limitations** | Bicycle and pedestrian crashes may be lower or not reported on shared use paths. The methodology applies the intersecting roadway score to the segments on the path within one half mile of the intersection to try to account for this and the crashes that may occur at the intersection of the path and road, but for path segments not near an intersection, the maximum score a path can receive is lower than the maximum score for roadway segments. |
| **Recommended Scaling** | Proportionate |

## Social Equity: Youth and Senior Population

| Variable | Youth and Senior Populations |
|---|---|
| **Factor** | Social Equity |
| **Description** | This criterion identifies areas with higher concentrations of youth and senior populations, designed to help prioritize improvements on highway segments that serve areas with populations with higher propensity to bike and walk and of greater need for comfortable infrastructure. |
| **Data Needs** | Most recent available American Community Survey data at the block group level for the following attributes:<br>▪ Elderly populations (65 and older)<br>▪ Youth populations (under 18) |
| **Same method for pedestrian and bicycle?** | The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode. |
| **Proposed Methodology** | This criterion will be calculated at the census block group level as the sum of people 65 and older and 17 and younger divided by total block group population.<br><br>The equation used to develop the segment score is shown below:<br><br>$$Youth\ and\ senior\ populations = \frac{(Eld + Yth)}{Pop}$$<br><br>where:<br>Eld = # of residents over 65<br>Yth = # of residents under 18<br>Pop = Total population |
| **Limitations** | This criterion does not include other available indicators of transportation disadvantage, including but not limited to income or poverty status, disability status, English proficiency, car ownership, or race. Through the demographic analysis conducted in Task 3 and subsequent discussion with the City, it was determined that such trends do not show substantial spatial variation within the City, so they are not incorporated into this prioritization. |
| **Recommended Scaling** | Proportionate |

## Connectivity: Demand Analysis

| Variable | Demand Analysis |
|---|---|
| **Factor** | Connectivity |
| **Description** | The team performed a demand analysis in Task 3 of Plan production. This demand analysis identifies baseline levels of walking and biking around existing activity nodes and assesses latent bicycle and pedestrian demand that could be realized through the Plan. |
| **Data Needs** | Task 3 Demand Analysis results |
| **Same method for pedestrian and bicycle?** | The same methodology will be used for the bicycle and pedestrian analysis, but due to different pedestrian and bicycle demand scores, results for each mode may be different. |
| **Proposed Methodology** | The team will conduct a work session with the City to consider the results of the demand analysis and determine the most high-leverage segments or intersections to improve to provide better connectivity. Segments identified as priority demand segments will receive 1 point, while all other segments will receive 0 points. |
| **Limitations** | Simplifying the results of the demand analysis can allow for an easy to understand application, but it does not differentiate between areas that provide moderate but different levels of connectivity. |
| **Recommended Scaling** | Proportionate (binary) |

## Connectivity: Proximity to Schools

| Variable | Proximity to Schools |
|---|---|
| **Factor** | Connectivity |
| **Description** | Schools are an essential destination and are especially important for providing low stress biking and walking facilities. School districts are generally determined by location, increasing the opportunity for many students to bike and walk to school, but because most students are youth, they require less stressful facilities to bike and walk safely and comfortably. |
| **Data Needs** | School locations |
| **Same method for pedestrian and bicycle?** | The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode. |
| **Proposed Methodology** | The team will create a 1-mile buffer around each school. Segments within the buffer will receive 1 point, while all other segments will receive 0 points. Segments may receive more than 1 point if they are within 1 mile of multiple schools |
| **Limitations** | This will prioritize all schools equally; smaller schools that may have less walking and biking demand will receive the same priority as schools with more students. |
| **Recommended Scaling** | Proportionate (binary) |

## Quality of Service: Bicycle Level of Traffic Stress

| Variable | Bicycle Level of Traffic Stress |
|---|---|
| **Factor** | Quality of Service |
| **Description** | Level of Traffic Stress (LTS) is a measure originally developed at the Mineta Transportation Institute to estimate the level of stress a bicyclist may feel while riding along a particular roadway. In general, higher vehicle speeds, higher vehicle volumes, and lower levels of separation between bicyclists and vehicles lead to higher levels of traffic stress. In Task 3 of this Plan production, the team performed an on-street LTS analysis for the City and a corresponding path LTS evaluation to provide scores for off-street segments. |
| **Data Needs** | Task 3 LTS analysis results |
| **Same method for pedestrian and bicycle?** | This criterion only applies to the bicycling mode. |
| **Proposed Methodology** | Low stress facilities (LTS 1 and 2) will receive 0 points, and high stress facilities (LTS 3 and 4) will receive 1 point. |
| **Limitations** | Level of traffic stress has been emerging as an analysis approach and metric that is widely applicable, intuitive, and easy to understand. It can also help inform the type of design that will provide "low-stress" facilities that are attractive to all users. However, some risk factors that may affect bicyclist comfort are not included in the Level of Traffic Stress assessment (e.g., driveway density and presence of signals). |
| **Recommended Scaling** | Proportionate (binary) |

## Quality of Service: Sidewalk Gaps

| Variable | Sidewalk Gaps |
|---|---|
| **Factor** | Quality of Service |
| **Description** | Existing sidewalk gaps can create barriers to walking. If people walking do not know to expect a sidewalk gap, they may choose to walk that route and need to cross to avoid the sidewalk gap or may choose to walk in the road. Both of these options increase their exposure to motor vehicles. Others may plan their trip to avoid the sidewalk gap, which can add time and distance to the trip and in some circumstances may encourage the individual to take a different mode or not take the trip.<br>Identifying and prioritizing locations where there are sidewalk gaps can lead to improvements in these locations, which can ultimately increase the safety and comfort for pedestrians. |
| **Data Needs** | Geolocated sidewalk gap data |
| **Same method for pedestrian and bicycle?** | This criterion only applies to the pedestrian mode. |
| **Proposed Methodology** | Locations with no sidewalk gap will receive 0 points, while locations with a sidewalk gap will receive 1 point. |
| **Limitations** | Pedestrian safety and comfort can be affected by other characteristics not captured in this variable, like presence of a barrier, type of barrier, presence of street trees, speeds, number of lanes, and sidewalk width. |
| **Recommended Scaling** | Proportionate (binary) |

## Major Barriers: Freeway Crossings

| Variable | Freeway Crossings |
|---|---|
| **Factor** | Major Barriers |
| **Description** | Freeway ramps and crossings can create barriers for people biking and walking. Sometimes the crossing infrastructure over or under freeways is uncomfortable to bike and walk on, and intersections with freeway ramps may include high motor vehicle design speeds and volumes. This criterion will prioritize improving safety and quality of service for ramp terminal intersection and freeway crossings. |
| **Data Needs** | Locations of ramp terminals |
| **Same method for pedestrian and bicycle?** | The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode. |
| **Proposed Methodology** | Segments within 250 feet of a ramp terminal will receive a score of 1 and all other segments will receive a score of 0. |
| **Limitations** | This evaluation may not include all major barriers to biking and walking in the City, which may also include short segments of bridge, guardrail, or poor roadway or sidewalk conditions. |
| **Recommended Scaling** | Proportionate (binary) |

## Consistency with Past Planning: Previously Identified Projects

| Variable | Previously Identified Projects |
|---|---|
| **Factor** | Consistency with Past Planning |
| **Description** | This criterion will prioritize locations identified as needing improvements through the 2014 Dublin Bicycle and Pedestrian Master Plan. The Plan included a ranking of priority projects. Those are as follows:<br><br>- Tier Zero: Designed and planned, under-construction, scheduled,<br>- Tier One: Highest priority projects for grant funding with initial feasibility analysis and concept development in the Plan update<br>- Tier Two: High priority projects for grant funding that may require additional feasibility analysis<br>- Tier Three: All other projects<br><br>Those project tiers were based on feasibility of project delivery rather than project need. |
| **Data Needs** | Spatial priority project data from the 2014 Dublin Bicycle and Pedestrian Master Plan |
| **Same method for pedestrian and bicycle?** | The same methodology will be used for pedestrian and bicycle modes. Many projects include both bicycle and pedestrian improvements. |
| **Proposed Methodology** | Locations where there is a project and it has not yet been implemented will receive 1 point, while all other segments receive 0 points. |
| **Limitations** | Because the 2014 Dublin Bicycle and Pedestrian Master Plan did not consider project need in the tiering process, all projects will be scored the same. |
| **Recommended Scaling** | Proportionate (binary) |

# APPENDIX C

# NETWORK RECOMMENDATIONS: PROJECT LIST AND COST ESTIMATES

| Project ID | Tier | 2014 Plan Project Number | Project Description | Project Location | From | To | | | Miles | Cost- High | Cost - Low | Bicycle Project Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Segment Projects | | | | | | | | | | | | |
| S-1 | Tier I | | Study opportunities and create designs for traffic calming, striping, and signs to create Class III bikeways | Various locations for Class III facilities/neighborhood bikeways: Tamarack Drive, Davona Drive, St. Patrick Way, Lucania Street, Brighton Drive, Grafton Street, Antone Way, South Bridgepointe Lane, and Brannigan Street | | | | 5.139639 | 5.14 | $ 25,000 | $ 25,000 | Class III |
| S-2 | Tier I | | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) | Gleason Drive | Arnold Road | Brannigan Street | | 1.357487 | 1.36 | $ 239,000 | $ 239,000 | Class IIB |
| S-3 | Tier I | | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) | Hacienda Drive | Southern City Limits | Gleason Drive | | 0.6 | 0.60 | $ 106,000 | $ 106,000 | Class IIB |
| S-4 | Tier I | | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) | Dublin Boulevard | Scarlett Drive | Tassajara Road | | 1.3 | 1.30 | $ 229,000 | $ 229,000 | Class IIB |
| S-5 | Tier I | | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future and evaluate opportunities to lower speed limit; if speeds are not lowered, as a future phase provide a separated facility (Class I or Class IV) | Arnold Road | Dublin Boulevard | Altamirano Ave | | 0.3 | 0.30 | $ 53,000 | $ 53,000 | Class IIB |
| S-6 | Tier I | | Convert to a Class IIB bikeway through restriping | Grafton Street | Kohnen Way | Antone Way | | 0.235965 | 0.24 | $ 42,000 | $ 42,000 | Class IIB |
| S-7 | Tier I | | Convert to a Class IIB bikeway by restriping travel lanes on Tassajara, Dougherty, and Hacienda at the I-580 overcrossings | Tassajara Road, Dougherty Road, and Hacienda Drive | Southern City Limits | Dublin Boulveard | | 0.84877 | 0.85 | $ 150,000 | $ 150,000 | Class IIB |
| S-8 | Tier I | | Restripe to add buffer to the Class II facilities; if possible, provide wide buffer (greater than 3') for potential to add vertical separation to convert to Class IV in the future; as a future project phase, provide a separated facility (Class I or Class IV) | Tassajara Road | North Dublin Ranch Drive | Rutherford Drive | | 0.521904 | 0.52 | $ 2,784,000 | $ 138,000 | Class IIB |
| S-9 | Tier I | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Village Parkway | Amador Valley Boulevard | Northern City Limits | | 0.857586 | 0.86 | $ 4,803,000 | $ 945,000 | Class IV/Class I |
| S-10 | Tier II | | Implement the traffic calming, striping, and signs plans and designs created in project S-1 to create Class III bikeways | Various locations for Class III facilities/neighborhood bikeways: Tamarack Drive, Davona Drive, St. Patrick Way, Lucania Street, Brighton Drive, Antone Way, South Bridgepointe Lane, and Brannigan Street | 0 | 0 | | 5.139639 | 5.14 | $ 691,000 | $ 691,000 | Class III |
| S-11 | Tier II | | Restripe to add buffer to the Class II facilities and evaluate opportunities to lower speed limit or provide a Class IV or Class I facility | Village Parkway | Dublin Boulevard | Amador Valley Boulevard | | 0.342414 | 0.34 | $ 1,826,000 | $ 91,000 | Class IIB; reduced speed |
| S-12 | Tier II | | Evaluate opportunities to reduce speed limit along this corridor | Tassajara Road | Palisades Drive | North Dublin Ranch Drive | | 0.719841 | 0.72 | $ 18,000 | $ 18,000 | Reduced speed |
| S-13 | Tier II | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dougherty Road | Dublin Boulevard | Southern city limits | | 0 | 0.25 | $ 1,393,000 | $ 274,000 | Class IV/Class I |
| S-14 | Tier II | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Amador Valley Boulevard | Stagecoach Road | Dougherty Road | | 0.3 | 0.30 | $ 1,680,000 | $ 331,000 | Class IV/Class I |
| S-15 | Tier II | | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate for this location, and implement the chosen separated bicycle treatment. This project is anticipated to be implemented after the lower cost solution in S-7. | Tassajara Road | Gleason Drive | Southern City Limits | but not the bridge upgrades | 0.458282 | 0.46 | $ 2,567,000 | $ 505,000 | Class IV/Class I |
| S-16 | Tier II | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dublin Boulevard | Inspiration Drive | San Ramon Road | | 1.1 | 1.10 | $ 6,161,000 | $ 1,212,000 | Class IV/Class I |
| S-17 | Tier II | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dublin Boulevard | Inspiration Drive | Western extent | | 1.5 | 1.50 | $ 8,401,000 | $ 1,653,000 | Class IV/Class I |
| S-18 | Tier II | | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate for this location, and implement the chosen separated bicycle treatment. | Fallon Road | Gleason Drive | Southern city limits | but not the bridge upgrades | 1.2 | 1.20 | $ 6,721,000 | $ 1,322,000 | Class IV/Class I |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-19 | Tier II | | Make improvements to adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed. | Fallon Road | Gleason Drive | Tassajara Road | | 0 | 1.58 | $ 1,583,000 | $ 238,000 | Class IB |
| S-20 | Tier II | | Add buffered bike lanes along the Dublin Boulevard Extension | Dublin Boulevard | Tassajara Road | Eastern city limits | | 0 | 0.98 | $ 5,334,000 | $ 259,000 | Class IIB |
| S-21 | Tier II | | Work with Contra Costa County to design and implement Class IIB facilities | Tassajara Road | Palidsades Drive | Northern City Limits | 1584 | 1.584992 | 0.30 | $ 1,640,000 | $ 80,000 | Class IIB |
| S-22 | Tier II | 1-2A/1-2B | As recommended in the 2014 plan, upgrade to separated Class I facilities providing sufficient space to reduce conflicts between people walking and biking; evaluate opportunities to improve walkability by reducing obstructions; enhance median and lighting along Dublin Boulevard under I-680; improve sidewalk connection across commercial driveway and at bus stop (east of Regional Street); add pedestrian-scale lighting under I-680 Overpass. Install barrier in median underneath overcrossing to prohibit pedestrian crossings. | Dublin Boulevard | San Ramon Road | Dougherty Road | | 1.5 | 1.5 | $ 4,956,000 | $ 4,956,000 | Class IB |
| S-23 | Tier II | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dublin Boulevard | Dougherty Road | Scarlett Drive | | 0.3 | 0.45 | $ 1,974,000 | $ 497,000 | Class IV/Class I |
| S-24 | Tier II | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dublin Boulevard | Tassajara Road | Fallon Road | | | 1.20 | $ 6,887,457 | $ 1,322,083 | Class IV/Class I |
| S-25 | Tier II | | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility | Central Parkway | Tassajara Road | Fallon Road | | 1.126547 | 1.13 | $ 5,135,000 | $ 227,000 | Class IIB; reduced speed |
| S-26 | Tier III | | Study opportunities, create designs, and implement traffic calming and signs to create Class III Bikeways along the identified roadways | Various locations: N Dublin Ranch Drive, S Dublin Ranch Drive, Hansen Drive, Starward Drive, San Sabana Road, Southwick Drive, Hibernia Drive, Donohue Drive, Keegan Street, Peppertree Road, Madden Way, Kohnen Way, York Drive, Maple Drive, Inspiration Drive, and Vomac Road | 0 | 0 | | 7.302099 | 7.30 | $ 982,000 | $ 982,000 | Class III |
| S-27 | Tier III | | Add a Class IIA Bicycle Lane where no bike lane currently exists | Lockhart Street | Central Parkway | Dublin Boulevard | | 0.5 | 0.30 | $ 1,507,000 | $ 66,000 | Class IIA |
| S-28 | Tier III | | Add a Class IIA Bicycle Lane where no bike lane currently exists | John Monego Court | Dublin Boulevard | Southern extent | | 0.3 | 0.30 | $ 1,507,000 | $ 66,000 | Class IIA |
| S-29 | Tier III | | Add a Class IIA Bicycle Lane where no bike lane currently exists | Sierra Lane | Sierra Court | Dougherty Road | | 0.367522 | 0.37 | $ 1,846,000 | $ 81,000 | Class IIA |
| S-30 | Tier III | | Add a Class IIA Bicycle Lane where no bike lane currently exists | York Drive | Amador Valley Boulevard | Poplar Way | | 0.4 | 0.40 | $ 2,009,000 | $ 88,000 | Class IIA |
| S-31 | Tier III | | Add a Class IIA Bicycle Lane where no bike lane currently exists | Hibernia Drive | Dublin Boulevard | Summer Glen Drive | | 0.4 | 0.40 | $ 2,009,000 | $ 88,000 | Class IIA |
| S-32 | Tier III | | Add a Class IIA Bicycle Lane where no bike lane currently exists | Shannon Avenue | Vomac Road | Peppertree Road | | 0.4 | 0.40 | $ 2,009,000 | $ 88,000 | Class IIA |
| S-33 | Tier III | | Add a Class IIA Bicycle Lane where no bike lane currently exists | Glynnis Rose Drive | Central Parkway | Dublin Boulevard | | 0.3 | 0.30 | $ 1,507,000 | $ 66,000 | Class IIA |
| S-34 | Tier III | | Extend bike lanes and sidepaths along Central Parkway to Croak Road | Central Parkway | 500' west of Croak Road | Croak Road | | 0.087884 | 0.09 | $ 697,000 | $ 697,000 | Class IIA |
| S-35 | Tier III | | If Croak Road is improved south of S Terracina Drive, add low stress bicycle facilities based on anticipated speeds, volumes, and FHWA Bikeway Selection Guide recommendations | Croak Road/Volterra Drive | Volterra Court | Dublin Boulevard | | 1 | 1.10 | $ 2,860,000 | $ 2,860,000 | Class IIA |
| S-36 | Tier III | | Restripe to add buffer to the Class II facilities and evaluate opportunities to lower speed limit or provide Class IV or Class I facility | Central Parkway | Iron Horse Parkway | Tassajara Road | | 1.545072 | 1.40 | $ 223,000 | $ 223,000 | Class IIB; reduced speed |
| S-37 | Tier III | | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility | Gleason Drive | Fallon Road | Brannigan Road | | 0.742513 | 0.74 | $ 3,384,000 | $ 150,000 | Class IIB; reduced speed |
| S-38 | Tier III | | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility | Amador Plaza Road | Southern Extent | Amador Valley Boulevard | | 0.6 | 0.60 | $ 2,720,000 | $ 106,000 | Class IIB; reduced speed |
| S-39 | Tier III | | Upgrade to a Class IIB Bicycle lane and evaluate opportunities to lower the speed limit or provide Class IV or Class I facility | Silvergate Drive | San Ramon Road | Peppertree Road | | 0.2 | 0.20 | $ 907,000 | $ 35,000 | Class IIB; reduced speed |
| S-40 | Tier III | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Arnold Road | Dublin Boulevard | Southern city limits | | 0 | 0.30 | $ 1,600,000 | $ 80,000 | Class IIB; reduced speed |
| S-41 | Tier III | | Improve wayfinding and signage for parallel path on east side; restripe to upgrade Class IIA facilities to Class IIB facilities | Dougherty Road | Scarlett Drive | Northern City Limits | improve wayfinding | 1.4 | 1.40 | $ 284,000 | $ 284,000 | Class IIB |
| S-42 | Tier III | | Add a Class IIB bike lane where no bike lane currently exists or improve adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed. | Lockhart Street | Central Parkway | Gleason Drive | | 0.5 | 0.50 | $ 499,000 | $ 75,000 | Class IIB |
| S-43 | Tier III | | Add a Class IIB Bicycle Lane where no bike lane currently exists | Stagecoach Road | Amador Valley Boulevard | Northern City Limits | lower speed limit--need a study? | 0.9 | 0.90 | $ 4,800,000 | $ 239,000 | Class IIB |
| S-44 | Tier III | | Add a Class IIB Bicycle Lane where no bike lane currently exists | Sierra Ct | Dublin Boulevard | Northern extent | | 0.7 | 0.70 | $ 3,734,000 | $ 186,000 | Class IIB |
| S-45 | Tier III | | Upgrade from Class IIA to Class IIB Bicycle Lane | Amador Valley Boulevard | Village Parkway | Stagecoach Road | | 0.8 | 0.80 | $ 3,626,000 | $ 141,000 | Class IIB |

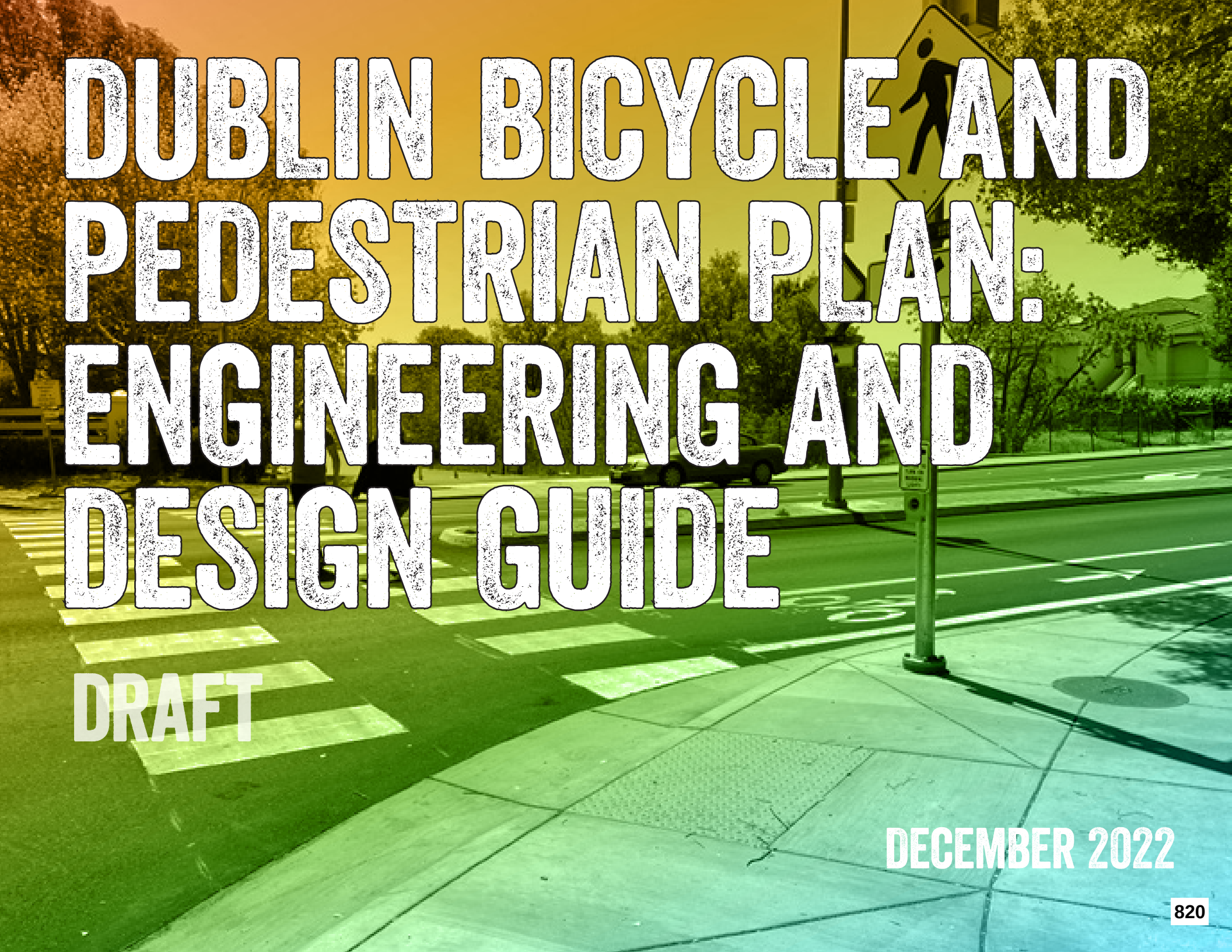
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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-46 | Tier III | | Restripe to a Class IIB Bicycle Lane where no bike lane currently exists | Bent Tree Drive | Fallon Road | East Sugar Hill Terrace | | 0.4 | 0.40 | $ 106,000 | $ 106,000 | Class IIB |
| S-47 | Tier III | | As a follow up to S-3, evaluate opportunities to lower the speed limit or provide Class IV or Class I facility | Hacienda Drive | Gleason Road | Dublin Boulevard | | 0 | 0.60 | $ 2,735,000 | $ 121,000 | Reduced speed |
| S-48 | Tier III | | Conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | Dougherty Road | Dublin Boulevard | Scarlett Drive | | 0.45123 | 0.45123 | $ 1,974,000 | $ 497,000 | Class IV/Class I |
| S-49 | Tier III | | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location, and implement the chosen separated bicycle treatment. This project is anticipated to be implemented after the lower cost solution in S-7. | Hacienda Drive | Dublin Boulevard | Southern city limits | not bridge | 0 | 0.30 | $ 1,680,000 | $ 331,000 | Class IV/Class I |
| S-50 | Tier III | | Upgrade pedestrian facility to improve comfort, especially across the I-580 overcrossing, and conduct a complete streets study to determine whether Class I or Class IV facilities are most appropriate and feasible for this location and implement the chosen separated bicycle treatment | San Ramon Road | Dublin Boulevard | Southern city limits | not bridge | 0.251646 | 0.30 | $ 1,680,000 | $ 331,000 | Class IV/Class I |
| S-51 | Tier III | | Make improvements to adjacent sidepaths to provide two-way bicycle and pedestrian connectivity by evaluating needs for and implementing wayfinding, signing, and striping improvements, intersection improvements, and crossings, as needed. | Dublin Boulevard | Scarlett Drive | Tassajara Road | | 1.77 | 1.77 | $ 1,768,000 | $ 266,000 | Class IB |
| S-52 | Tier III | | Upgrade from Class IIB to Class IV Bicycle Lane | Clark Ave/Village Parkway | Dublin Boulevard | Dublin Boulevard | | 0.3 | 0.50 | $ 2,227,000 | $ 320,000 | Class IV/Class I |
| S-53 | Tier III | | Add Class I facilities on both sides of the road on Martinelli Way and support the Class I facilities by adding signage, wayfinding, and crossing improvements at the intersections; connect to the BART Station by providing continuous Class I or Class IIA facilities along Iron Horse Parkway. | Martinelli Way and Iron Horse Parkway | BART Station on Iron Horse Parkway | Hacienda Drive | | 0.683253 | 1.50 | $ 3,900,000 | $ 3,900,000 | Class IV/Class I |
| S-54 | Tier III | | Add bike lanes with the implementation of the Golden Gate extension project | Golden Gate Drive | Dublin Boulevard | Amador Valley Boulevard | | 0.350907 | 0.350907 | $ 1,806,000 | $ 77,000 | Class IIA |
| | | | | | | | | | | | | |
| Trail Projects | | | | | | | | | | | | |
| T-1 | Tier I | | Implement Phase I and II of the Iron Horse Nature Park Master Plan to create park space and trail access and connectivity improvements | Iron Horse Regional Trail | | | | | | $ 11,560,000 | $ 11,560,000.00 | Trail |
| T-2 | Tier II | | Add trail connection from Regional Street to Amador Plaza Road | Downtown Dublin | Regional Street | Amador Plaza Road | | | 0.35 | $ 764,767 | $ 764,767.34 | Trail |
| T-3 | Tier II | | With development, add Class I connection between Dublin Boulevard and Central Parkway, just east of Tassajara Road | East of Tassajara approximately 500 ft | Dublin Boulevard | Central Parkway | | | 0.284090909 | $ 620,753 | $ 620,752.71 | Trail |
| T-4 | Tier III | | Add trail connection along Dublin Creek along the Zone 7 channel, to connect at San Ramon Road | Dublin Creek Trail | Amador Plaza Road | San Ramon Road | | | 0.706325758 | $ 1,543,357 | $ 1,543,356.78 | Trail |
| T-5 | Tier III | | Create connection to Shannon Community Center from the San Ramon Bike Path | San Ramon Bike Path | Shannon Community Center | 0 | | | 0.01 | $ 21,850 | $ 21,319.04 | Trail |
| T-6 | Tier III | | Add Class I facility along east side of Village to connect to the Alamo Canal Trail | Alamo Canal Trail | Dublin High School and Village Parkway | Alamo Canal Trail between Cedar Lane and Ebensburg Lane | | | 1.06 | $ 2,316,153 | $ 2,259,818.03 | Trail |
| T-7 | Tier III | | As recommended in the 2014 plan, widen existing sidewalk and add signing and striping treatments to create a shared use path on the south side of Dublin Boulevard. | Dublin Boulevard | Amador Plaza Road | Village Parkway | | | 0.22 | $ 586,257 | $ 586,256.72 | Trail |
| T-8 | Tier III | | Add a bicycle and pedestrian bridge over the canal to create Class I connection between Village Parkway/Clark Avenue at Alamo Canal Trail at the Dublin Public Safety Complex Site | Alamo Canal Trail/Civic Plaza | Village Parkway/Clark Avenue | Alamo Canal Trail | | | 0.1 | $ 6,318,000 | $ 6,318,000.00 | Trail |
| T-9 | Tier III | | Create Class I connection along the future Dublin Boulevard Extension corridor from Fallon Road to Collier Canyon Parkway (Livermore) | Dublin Boulevard Extension | Fallon Road | Collier Canyon Park (Livermore) | | | 0.98 | $ 6,475,500 | $ 6,475,500.00 | Trail |
| T-10 | Tier III | | Through development, add Class I facility on the west side of Brannigan St. from Central Parkway to Gleason Boulevard | Brannigan Street | Central Parkway | Gleason Boulevard | | | 0.19 | $ 506,313 | $ 506,312.62 | Trail |
| T-11 | Tier III | | Add Class I connection and street crossing enhancements on the north side of Central Parkway from Emerald Glen Park/Tassajara Road to Brannigan Street | Central Parkway | Emerald Glen Park/Tassajara Road | Brannigan Street | | | 0.18 | $ 606,187 | $ 606,187.23 | Trail |
| T-12 | Tier III | | Add Class I connection along the south side of the school grounds and Dublin Swin Center from Iron Horse Trail to Village Parkway | Dublin High School | Iron Horse Trail | Village Parkway | | | 0.59 | $ 1,289,179 | $ 1,257,823.24 | Trail |
| T-13 | Tier III | | Study options for gap closure to provide a bicycle and pedestrian overcrossing and shared use path from Tassajara Creek at Dublin Boulevard south over I-580 into Pleasanton | Tassajara Creek | Dublin Boulevard | Pleasanton | | | 0.27 | $ 250,000 | $ 250,000.00 | Trail |
| T-14 | Tier III | | Add Class I connection along the southern edge of Nielson Elementary to connect Amarillo Road with the existing path along Mape Memorial Park to san Ramon Road | Nielson Elementary School | Amarillo Road | Mape Memorial Park Path | | | 0.17 | $ 371,458 | $ 362,423.65 | Trail |
| T-15 | Tier III | | Add Class I connection along Altamirano Street between the Dublin BART station and Martinelli Way | Altamirano Street | Dublin BART station | Martinelli Way | | | 0.71 | $ 1,892,010 | $ 1,892,010.33 | Trail |
| T-16 | Tier III | | Add Class I connections along Croak Road from Dublin Boulevard to Positano Parkway | Croak Road | Dublin Boulevard | Positano Parkway | | | 0.9 | $ 2,398,323 | $ 2,398,322.96 | Trail |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T-17 | Tier III | | Add or improve trails along Positano Parkway to connect to the trail on Croak Road | Positano Parkway | Croak Road | La Strada Drive | | | 0.76 | $ 2,025,250 | $ 2,025,250.50 | Trail |
| T-18 | Tier III | | Add Class I connection between the existing Tassajara Creek trailhead on Tassajara Road and trails in the Wallis Ranch development | Tassajara Creek Trail | Tassajara Road Trailhead | Wallis Ranch development trails | | | 0.46 | $ 1,005,123 | $ 980,675.75 | Trail |
| | | | | | | | | | | | | |
| Freeway Crossing Projects | | | | | | | | | | | | |
| FC-1 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | San Ramon Road at southbound I-580 westbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-2 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | San Ramon Road at northbound I-580 westbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-3 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | San Ramon Road at I-580 westbound ramp terminal | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-4 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | St. Patrick Way at I-580 ramp terminal and entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-5 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Dougherty Road at I-580 westbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-6 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Dougherty Road at I-580 westbound ramp terminal | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-7 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Dougherty Road at I-580 eastbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-8 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Hacienda Drive at I-580 westbound ramp terminal | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-9 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Hacienda Drive at I-580 eastbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-10 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Hacienda Drive at I-580 westbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-11 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Tassajara Road at I-580 westbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-12 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Tassajara Road at I-580 westbound ramp terminal | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-13 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Tassajara Road at I-580 eastbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-14 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Fallon Road at I-580 westbound ramp terminal and entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-15 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Fallon Road at I-580 eastbound ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| FC-16 | Tier III | | Redesign interchange ramp terminal to provide safe crossings | Village Parkway at I-680 NB ramp entrance | | | | | | $ 1,115,000 | $ 1,115,000.00 | Freeway Crossing |
| | | | | | | | | | | | | |
| Crossing Projects | | | | | | | | | | | | |
| C-1 | Tier I | | Provide mid-block crossing (RRFB or other actuated treatment) | Regional Street between Dublin Boulevard and Amador Valley Boulevard | | | | | | $ 320,000 | $ 320,000.00 | Crossing |
| C-2 | Tier I | Existing Iron Horse Trail Crossing project | Provide pedestrian and bicycle overcrossing to connect to Don Biddle Community Park | Dublin Boulevard and Iron Horse Trail | | | | | | $ 6,318,000 | $ 6,318,000.00 | Crossing |
| C-3 | Tier II | | Add connection from Sierra Court to the Alamo Canal/Iron Horse Trail network | Sierra Court cul-de-sac | | | | | | $ 2,132,000 | $ 2,132,000.00 | Trail |
| C-4 | Tier III | | Study the feasibility of improving the crossing of Tassajara Creek Trail at Dublin Boulevard by providing better connections to the existing crossing at John Monego Court. Provide wayfinding and signs to direct people biking and walking between the trail and the intersection. | Tassajara Creek Trail and Dublin Boulevard | | | Implement signal timing, | | | $ 123,000 | $ 123,000.00 | Crossing |
| C-5 | Tier III | | Improve connections to nearby crossings or add crossing at Tassajara Road and Tassajara Creek Trail (south of Rutherford Drive) to provide access to the trailhead; improve general access to and connectivity from the trail to Tassajara Road and local destinations | Tassajara Creek Trail and Tassajara Road | | | | | | $ 627,000 | $ 627,000.00 | Crossing |
| | | | | | | | | | | $ - | $ - | |
| Intersection Projects | | | | | | | | | | $ - | $ - | |
| I-1 | Tier I | | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school | Central Parkway/Aspen Street | | | | | | $ 320,000 | $ 320,000.00 | Intersection |
| I-2 | Tier I | | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school | Grafton Street/Antone Way | | | | | | $ 320,000 | $ 320,000.00 | Intersection |
| I-3 | Tier I | | Provide crossing improvements (RRFB or other actuated treatment) to provide more visibility of people walking/biking, especially to school | Amador Valley Boulevard/Burton Street | | | | | | $ 320,000 | $ 320,000.00 | Intersection |
| I-4 | Tier II | 2-2H | As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Remove slip lanes; reduce curb radii on all corners; install curb extensions on the SE and SW corners; install directional curb ramps. | Village Parkway/Amador Valley Boulevard | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-5 | Tier II | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Village Parkway/Tamarack Drive | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-6 | Tier II | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Village Parkway/Brighton Drive | | | | | | $ 972,000 | $ 123,000.00 | Intersection |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I-7 | Tier II | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Hibernia Drive | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-8 | Tier II | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Arnold Road | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-9 | Tier II | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Hacienda Drive | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-10 | Tier II | 1-2F | As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Reduce width of SB right-turn lane and reduce turning radii; remove NB right-turn slip lane and reduce curb radii; reduce curb radii on NE and SE corners; straighten crosswalks. | Dublin Boulevard/Village Parkway | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-11 | Tier III | | Provide higher visibility crossing treatments, especially to support access to the school | Grafton Street/Madden Way/Kohnen Way | | | | | | $ 320,000 | $ 627,000.00 | Intersection |
| I-12 | Tier III | | Provide higher visibility crossing treatments, especially to support access to the school | Antone Way/Bridgepointe Lane | | | | | | $ 320,000 | $ 4,000.00 | Intersection |
| I-13 | Tier III | | Provide higher visibility crossing treatments, especially to support access to the school | S Dublin Ranch Drive/Woodshire Lane | | | | | | $ 320,000 | $ 4,000.00 | Intersection |
| I-14 | Tier III | | Add Class I signage, striping, and signal changes to create visibility of people walking and biking across the existing Tassajara Road and Palisades Drive signalized crossing | Tassajara Road and Palisades Drive | | | | | | $ 123,000 | $ 123,000.00 | Intersection |
| I-15 | Tier III | | Provide Class I facilities on the west side of Silvergate Drive and make intersection changes at Hansen Drive and Bay Laurel Street to provide comfortable connectivity to the existing stop controlled intersection at Hansen Drive | Martin Canyon Creek Trail at Silvergate Drive | | | | | | $ 2,600,000 | $ 2,600,000.00 | Intersection |
| I-16 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Gleason Drive/Grafton Street | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-17 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Gleason Drive/Brannigan street | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-18 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Central Parkway/Brannigan street | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-19 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Brannigan street | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-20 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Central Parkway/Hibernia Drive | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-21 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Central Parkway/Hacienda Drive | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-22 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Regional Street | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-23 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Tassajara Road/Gleason Drive | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-24 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Fallon Road /Central Parkway | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-25 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Dublin Boulevard/Golden Gate Drive | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-26 | Tier III | | Improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. | Fallon Road /Dublin Boulevard | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-27 | Tier III | 1-2E | As recommended in the 2014 plan, reduce curb radii on all corners; install directional curb ramps at all corners<br>Subject to further analysis, remove NB overlap phase; install pedestrian countdown signals and audible warning signs<br>Stripe crosswalk on south leg subject to further analysis | Dublin Boulevard/San Ramon Road | | | | | | $ 972,000 | $ 123,000.00 | Intersection |
| I-28 | Tier III | 2-2G/2-2E/2-2F | As recommended in the 2014 plan, consider adding leading pedestrian intervals for all approaches; Consider removing slip lanes on NW and NE corners and add curb extensions on SW, NW, and NE corners pending additional engineering analysis; Consider striping crosswalk on south leg pending additional engineering analysis | San Ramon Road/Amador Valley Boulevard | | | | | | $ 548,000 | $ 123,000.00 | Intersection |
| I-29 | Tier III | 2-2D | As recommended in the 2014 plan, consider modifying signal to include leading pedestrian interval on EB and WB approaches; Consider protected left-turn phasing for NB and SB traffic. | Regional Street/Amador Valley Boulevard | | | | | | $ 123,000 | $ 123,000.00 | Intersection |
| I-30 | Tier III | 1-1E | As recommended in the 2014 plan, mark crosswalk on east leg of intersection; Widen median and add median tips as feasible to provide 6' pedestrian refuge; Reduce curb radii | Amador Valley Boulevard/Amador Plaza | | | | | | $ 123,000 | $ 123,000.00 | Intersection |
| I-31 | Tier III | 1-2C | As recommended in the 2014 plan, improve safety for people walking and biking by implementing strategies like protected intersection treatments, signing, bike lane skip striping through the intersection, bike boxes, leading pedestrian intervals, or by separating bicyclists and pedestrians from turning movements. Reduce curb radii on all corners and install directional curb ramps. | Dublin Boulevard/Amador Plaza Road | | | | | | $ 123,000 | $ 123,000.00 | Intersection |
| I-32 | Tier III | 2-1A/2-1B | As recommended in the 2014 plan, install wayfinding signage to West Dublin BART; install bulb-outs at all corners; construct directional curb ramps | St. Patrick Way/Golden Gate Drive | | | | | | $ 123,000 | $ 123,000.00 | Intersection |
| I-33 | Tier III | 2-2B | As recommended in the 2014 plan, reduce curb radii on all corners; widen medians and add median tips; install directional curb ramps on all corners | Amador Valley Boulevard/Donohue Drive | | | | | | $ 123,000 | $ 123,000.00 | Intersection |

# APPENDIX D

# ENGINEERING AND DESIGN GUIDE



# DUBLIN BICYCLE AND PEDESTRIAN PLAN: ENGINEERING AND DESIGN GUIDE

DRAFT

DECEMBER 2022

# INTRODUCTION

This guide was developed as a reference document for best practices in planning and designing bicycle and pedestrian facilities. It first provides resources relevant to planning and designing pedestrian and bicycle facilities, including a list of specific design topics and guidance document recommendations to consult. It then provides specific planning and design recommendations for several key topics relevant to developing Dublin's biking and walking infrastructure.

In applying this design guidance, the responsible engineer should use professional judgment and document design decisions. Decisions should be made based on location specific context and the obligation to protect the life, health, and property of the public.


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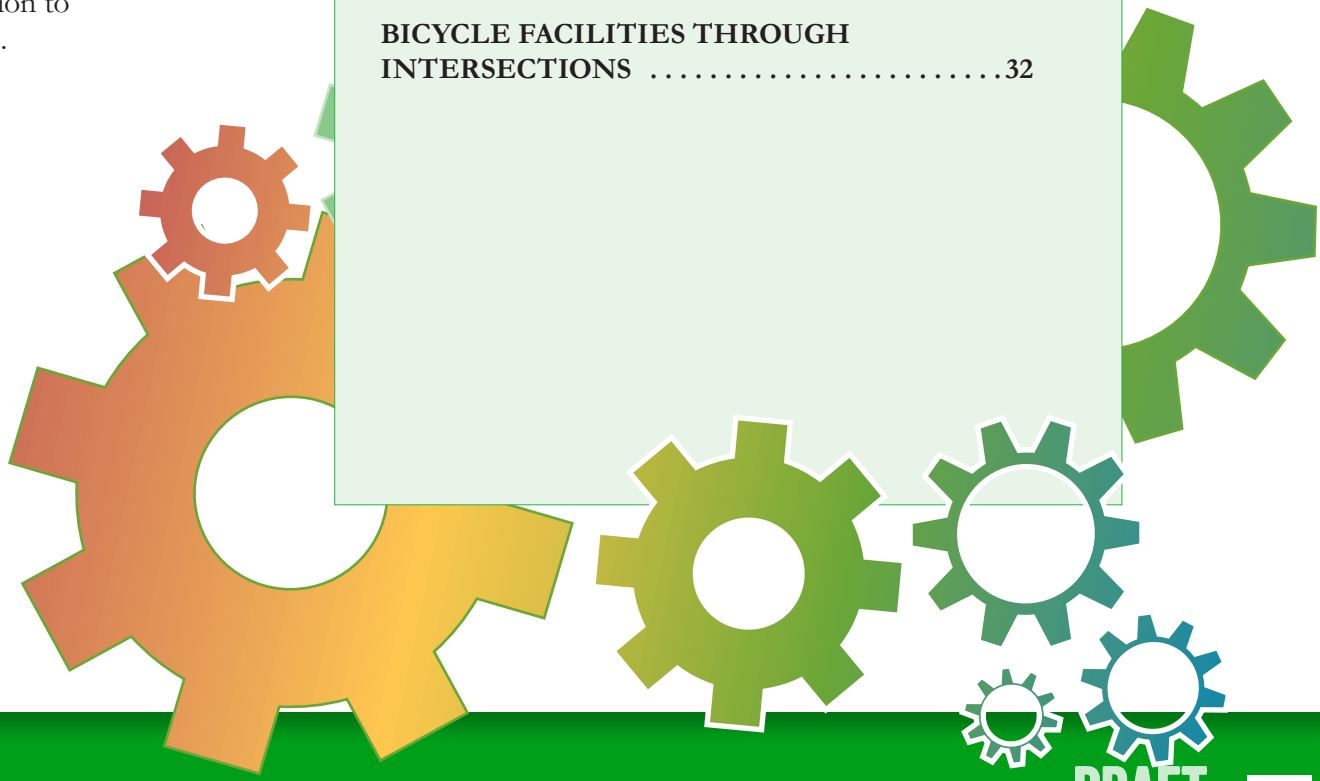
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# RESOURCES

The following resources should be used as references for best practices in planning and design for pedestrian facilities.

## KEY RESOURCES

- *AASHTO Guide for the Development of Bicycle Facilities, Fourth Edition (2012)* – likely to be replaced by the Fifth Edition in 2022
- *NACTO Urban Bikeway Design Guide, Second Edition (2014)*
- *NACTO Urban Street Design Guide (2013)*
- *FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)*
- *CalTrans Highway Design Manual (2018)*
- *FHWA Separated Bike Lane Planning and Design Guide (2015)*
- *FHWA Manual on Uniform Traffic Control Devices (2009)*
- *California Manual on Uniform Traffic Control Devices, Revision 6 (2021)*

## SUPPLEMENTAL RESOURCES

- TCRP Report 112/NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings. Washington D.C.: TCRP and NCHRP, 2006.
- *Routine Accommodations of Pedestrians and Bicyclists in the Bay Area,* Metropolitan Transportation Commission, Available: https://mtc.ca.gov/sites/default/files/A-08_RES-3765_complete_streets.pdf 2006.
- *Complete Streets Checklist Guidance Resolution 4493*, Metropolitan Transportation Commission, Available: https://mtc.ca.gov/sites/default/files/documents/2022-05/MTC-Administrative-Guidance-CS-Checklist.pdf (2022)



# DESIGN TOPICS AND RELEVANT GUIDANCE

| DESIGN TOPIC | DESIGN RESOURCE | RELEVANT PAGES/LOCATION |
|---|---|---|
| **Sidewalks and Sidewalk Zones** | NACTO Urban Street Design Guide (2013) https://nacto.org/publication/urban-street-design-guide/<br>Guide for the Planning Design and Operation of Pedestrian Facilities (2004) https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf | Pages 37– 44; https://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/<br><br>Chapter 3.2; Pages 54 - 70 |
| **Pedestrian Wayfinding** | Seamless Seattle Pedestrian Wayfinding Strategy (2019)<br>Global Street Design Guide (2016) Global Street Design Guide \| Global Designing Cities Initiative | Wayfinding Strategy_July2019_SDOT Edit.pdf (seattle.gov)<br><br>6.3.9; Page 91; https://globaldesigningcities.org/wp-content/uploads/guides/global-street-design-guide-lowres.pdf |
| **Street Furniture** | Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-way (2013) https://www.access-board.gov/prowag/preamble-prowag/ | Page 70; https://www.access-board.gov/prowag/preamble-prowag/#r212-street-furniture |
| **Pedestrian Scale Lighting** | FHWA Pedestrian Lighting Primer (2022) https://safety.fhwa.dot.gov/roadway_dept/night_visib/docs/Pedestrian_Lighting_Primer_Final.pdf | Entire document |
| | FHWA Lighting Handbook (2012) https://safety.fhwa.dot.gov/roadway_dept/night_visib/lighting_handbook/pdf/fhwa_handbook2012.pdf | Pages 75-78 |
| | Street Design Manual: Lighting Update (2016) https://www.sandiego.gov/sites/default/files/street_design_manual_-_lighting_update_2016_2.pdf | Pages 2-3 |
| | Guide for the Planning Design and Operation of Pedestrian Facilities https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf | Chapter 3.2.11, Page 65 |

| DESIGN TOPIC | DESIGN RESOURCE | RELEVANT PAGES/LOCATION |
|---|---|---|
| **Crosswalk Markings** | Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/ | https://mutcd.fhwa.dot.gov/htm/2009r1r2/part3/part3b.htm#section3B18 |
| **Uncontrolled Crossing Enhancements** | NACTO Urban Street Design Guide (2013):" https://nacto.org/publication/urban-street-design-guide/<br><br>FHWA Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations (2005) https://www.fhwa.dot.gov/publications/research/safety/04100/04100.pdf | https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/midblock-crosswalks/<br><br>Pages 49 - 61 |
| **Special Paving Treatments** | FHWA Pedestrian Safety Guide and Countermeasure Selection System (2013) http://www.pedbikesafe.org/pedsafe/index.cfm | http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=39 |
| **Crossing Islands** | NACTO Urban Street Design Guide (2013): https://nacto.org/publication/urban-street-design-guide/ | Page 116; https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/pedestrian-safety-islands/ |
| **In-Street Pedestrian Crossings Signs** | Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/ | https://mutcd.fhwa.dot.gov/htm/2009r1r2/part2/part2b.htm#section2B12 |
| **Reduced Radii and Sidewalk Corners** | NACTO Urban Street Design Guide (2013): https://nacto.org/publication/urban-street-design-guide/ | Pages 117-118/ https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/corner-radii/ |
| **Curb Extensions, Including Chicanes** | NACTO Urban Street Design Guide (2013): https://nacto.org/publication/urban-street-design-guide/<br><br>Guide for the Planning Design and Operation of Pedestrian Facilities<br><br>https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf | Pages 45- 50; https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/<br><br>Chapter 2.6.2 Page - 43 |

| DESIGN TOPIC | DESIGN RESOURCE | RELEVANT PAGES/LOCATION |
|---|---|---|
| **Curb Ramps** | Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-way https://www.access-board.gov/prowag/preamble-prowag/ | Pages 36 – 37;<br>https://www.access-board.gov/prowag/preamble-prowag/#r304-curb-ramps-and-blended-transitions |
| **Right-Turn Slip Lane** | FHWA Pedestrian Safety Guide and Countermeasure Selection System (2013) http://www.pedbikesafe.org/pedsafe/index.cfm | http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=24 |
| **Advanced Yield Markings** | Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/<br>California Manual on Uniform Traffic Control Devices (2014) https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ca-mutcd/rev6/camutcd2014-rev6.pdf | https://mutcd.fhwa.dot.gov/htm/2009r1r2/part2/part2b.htm#section2B11<br>Section 2B.11 |
| **Advanced Warning Signs** | Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/ | Sign R1-5a |
| **Crossing Types: RRFB, PHB, Grade Separated Crossings,** | Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/ | Sections 4C.05, 4C.06, 4F.01, 4L.03 |

| DESIGN TOPIC | DESIGN RESOURCE | RELEVANT PAGES/LOCATION |
|---|---|---|
| **Pedestrian Signal Timing** | NACTO Urban Street Design Guide: https://nacto.org/publication/urban-street-design-guide/ | NACTO pages 125 – 134; https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/ |
| | Guide for the Planning Design and Operation of Pedestrian Facilities https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07(263)_FR.pdf | Chapter 4.1.2 – Page 101 |
| | Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/ | 4E.06; https://mutcd.fhwa.dot.gov/htm/2009/part4/part4e.htm |
| **Leading Pedestrian Intervals** | NACTO Urban Street Design Guide: https://nacto.org/publication/urban-street-design-guide/ | Page 128; https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/traffic-signals/leading-pedestrian-interval/ |
| **Signal Phasing-Protected Left Turns and Split Phasing** | FHWA Pedestrian Safety Guide and Countermeasure Selection System (2013) http://www.pedbikesafe.org/pedsafe/index.cfm | http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=51 |
| **Bus Stop Accessibility** | Toolkit for the Assessment of Bus Stop Accessibility and Safety (2 https://www.nadtc.org/wp-content/uploads/NADTC-Toolkit-for-the-Assessment-of-Bus-Stop-Accessibility.pdf | Page 10 |
| | ADA Accessibility Guidelines (2002): Adaag 1991 2002 (access-board.gov) | Section 10.2; https://www.access-board.gov/adaag-1991-2002.html#tranfac |

| DESIGN TOPIC | DESIGN RESOURCE | RELEVANT PAGES/LOCATION |
|---|---|---|
| **Bikeway selection** | FHWA Bikeway Selection Guide:<br><br>https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf<br><br>Also see supplemental guidance pages XYZ | Pages 22-23 |
| **Class I Shared Use Path & Shared Use Path Features** | Guide for the Planning Design and Operation of Pedestrian Facilities (2021) | Chapter 3.4 |
| **Grade Separation** | Guide for the Planning Design and Operation of Pedestrian Facilities (2021) | Section 3.6.4.6 |
| **Curb Ramps** | Public Right of Way Accessibility Guidelines (PROWAG) (2013) https://www.access-board.gov/files/prowag/PROW-SUP-SNPRM-2013.pdf<br><br>Guide for the Planning Design and Operations of Pedestrian Facilities (2021) | R304; https://www.access-board.gov/prowag/chapter-r3-technical-requirements/#r304-curb-ramps-and-blended-transitions<br><br>Section 3.6.4.5 |
| **Crossing Treatments** | Guide for the Planning Design and Operation of Pedestrian Facilities (2021) | Chapter 3.6 |
| **Bicycle Signal Heads** | NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/ | Page 91; https://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/ |
| **Unsignalized Intersections** | NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/ | Page 105; https://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/ |

| DESIGN TOPIC | DESIGN RESOURCE | RELEVANT PAGES/LOCATION |
|---|---|---|
| **Sidepaths** | AASHTO Guide for the Development of Bicycle Facilities (2012) | Chapter 5, Page 8 |
| **Sidepath Intersection Design Considerations** | AASHTO Guide for the Development of Bicycle Facilities (2012) | Chapter 5, Page 42 |
| **Class IIA Bicycle Lanes** | California Highway Design Manual https://dot.ca.gov/-/media/dot-media/programs/design/documents/hdm-complete-12312020a11y.pdf | Section 301.2 |
| | AASHTO 2012 Guide for the Development of Bicycle Facilities<br><br>https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/ | Chapter 4, Pages 11 -22 |
| | Urban Bicycle Design Guide https://nacto.org/publication/urban-bikeway-design-guide/ | Pages 1 – 21/https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/ |
| **Bicycle Facility Design** | California Highway Design Manual https://dot.ca.gov/-/media/dot-media/programs/design/documents/hdm-complete-12312020a11y.pdf | Sections 301 & 1000 |
| | NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/ | Page 119/https://nacto.org/publication/urban-bikeway-design-guide/bikeway-signing-marking/ |
| | Geometric Design of Highways and Streets | Chapter 4 Page 77; Chapter 5 Page 8; Chapter 6 Page 7; Chapter 9 Page 156 |

| DESIGN TOPIC | DESIGN RESOURCE | RELEVANT PAGES/LOCATION |
|---|---|---|
| **Bicycle Parking** | AASHTO 2012 Guide for the Development of Bicycle Facilities<br><br>https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/ | Chapter 6 |
| | Transit Street Design Guide https://nacto.org/publication/transit-street-design-guide/transit-streets/ | Chapter 4 Page 105 |
| **Bicycle Facility Maintenance** | AASHTO 2012 Guide for the Development of Bicycle Facilities<br><br>https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/ | Chapter 7 |
| **Bicycle Signals** | AASHTO 2012 Guide for the Development of Bicycle Facilities:<br><br>https://nacto.org/references/aashto-guide-for-the-development-of-bicycle-facilities-2012/ | Chapter 4 Page 43 |
| | Manual on Uniform Traffic Control Devices (2009): https://mutcd.fhwa.dot.gov/ | MUTCD Figure 9C-7 (bicycle detector pavement markings); Section 4D.08 through 4D.16 (signal placement) |
| | NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/ | Pages 91 – 111; https://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/ |

| DESIGN TOPIC | DESIGN RESOURCE | RELEVANT PAGES/LOCATION |
|---|---|---|
| **Restriping to Add Bicycle Facilities** | FHWA: Incorporating On-Road Bicycle Networks into Resurfacing Projects, 2016<br><br>https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf | Entire document |
| **Stormwater Management** | NACTO Urban Bikeway Design Guide: https://nacto.org/publication/urban-bikeway-design-guide/<br><br>LA Model for Living Streets Design Manual (2011)<br><br>https://www.cleanwaterprogram.org/resources/resources/la-living-streets-design-manual/download.htmlChapter 11 | Pages 65 – 70; https://nacto.org/publication/urban-street-design-guide/street-design-elements/stormwater-management/ |



# SUPPLEMENTAL GUIDANCE

# SIDEWALK WIDTH RECOMMENDATIONS

Streets and sidewalks should support the activities and pedestrian levels along the street. Sidewalks should be wide enough to support the expected pedestrian volumes. This Plan recommends a minimum width of six feet for the pedestrian pathway section of a sidewalk, which is wide enough for two people to walk side by side, can be navigated by persons with mobility impairments, and meets current ADA requirements. See Table 1 for recommended sidewalk widths by context. In addition to Table 1, if a specific area plan with recommended cross section widths exists for a project location, refer to the specific area plan guidance.

ADA sidewalk regulations specify that routes with less than 60 inches, or five feet of clear width must provide passing spaces, or wider areas that can accommodate two wheelchairs passing, at least 60 inches wide at reasonable intervals not exceeding 200 feet, and a five feet by five feet turning space should be provided where turning or maneuvering is necessary. If a sidewalk is directly adjacent to moving traffic, 2 feet should be added to the absolute minimum clear path width to provide buffer and space for street furniture and utilities. Based on the Caltrans Highway Design Manual, the minimum width of a sidewalk should be 8 feet between a curb and building when in urban and rural main street place types, 6 feet in all other locations when continuous to a curb, or 5 feet when separated by a planting strip.

In addition to the typical sidewalk widths, the context should dictate other design feature as well, identified below:

- **Edge/ Curb Zone -** At a minimum, such as in areas with lower pedestrian activity, there should be a 6-inch-wide curb. Other areas, such as downtowns, should have at least an extra foot to accommodate car doors to not conflict with the sidewalk.
- **Furnishing/Landscape Zone -** This area acts as a buffer between the curb and throughway zone. This is the areas where trees should be planted, and benches should be located. Any sidewalk amenities should be located within this area and should not interfere with the throughway zone. A furnishing zone must be a minimum of 3 feet to have the opportunity to include street trees or landscaping. The landscape buffer should increase in width as speeds increase: four feet is the recommended minimum buffer for areas that are 25 mph and the buffer should increase 1 foot for every 5 mph increase in speed.
- **Throughway zone – This area acts as the sidewalk clear zone.** See Table 1 for recommended sidewalk widths for the throughway zones.
- **Frontage Zone -** This area borders the building façade or fence. The primary purpose of this zone is to create a buffer between pedestrians walking in the throughway zone from people entering and exiting buildings. It provides opportunities for shops to place signs, planters, or chairs that do not encroach into the throughway zone.

*Table 1: Recommended Sidewalk Widths by Context*

| LAND USE CONTEXT | RECOMMENDED SIDEWALK WIDTH | RECOMMENDED GREENSCAPE/ FURNISHING ZONE WIDTH |
|---|---|---|
| Residential and industrial areas | 8 feet – 5 feet | 6 feet – 3 feet |
| Downtown or commercial areas | 12 feet – 8 feet | 8 feet – 3 feet |
| Schools | 10 feet – 8 feet | 8 feet – 3 feet |

# BIKEWAY SELECTION

## CLASS IA: BIKE PATHS OR SHARED USE PATHS

**DESCRIPTION:**

Bike paths provide a completely separated facility designed for the exclusive use of bicyclists and pedestrians with minimal or no conflicting motor vehicle traffic. Generally, these corridors are not served by streets, and the path may be along a river, converted rail right-of-way, or powerline, or other car-free corridors.

**TYPICAL APPLICATION:**

Class IA paths may provide connectivity between neighborhoods or communities, to parks or recreational areas, along or to rivers or streams, or to other destinations without travelling along a roadway corridor.

**COST ESTIMATE:**

$2.2M per mile, including design and construction for the path, assuming the inclusion of two high visibility actuated crossings

**DESIGN CONSIDERATIONS:**

- The width of a shared-use path may vary based on expected bicyclist and pedestrian volume and right-of-way constraints. For accessibility purposes, trails should be limited to 5% grade.
- Where right-of-way or other physical constraints exist, sidepaths may be provided adjacent to the roadway. Information about these facilities, Class IB facilities, are provided on the next page.




*Iron Horse Regional Trail, Dublin, California  Source: Kittelson & Associates, Inc.*

## PREFERRED DESIGN AND ELEMENTS:

- A 10 ft wide path with 2 ft shoulders on each side is preferable (14 ft total). The higher the anticipated volumes of users, the greater the width should be to accommodate these users comfortably.
- Pedestrian-scale lighting improves visibility, particularly at intersection crossings, tunnels, underpasses, trail heads, and rest areas.
- A shy distance of at least one foot allows adequate lateral clearance for the placement of signs or other vertical objects. If objects are shorter than 3 feet tall, they may not present an obstruction for cyclists.

## REQUIRED ELEMENTS:

- While the width may vary along a path, a path should be at least 10 feet wide except in rare cases and for short distances.
- Path must include at least 2 feet (3 feet preferred) horizontal clearance between the paved edge of path and obstructions.
- Path crossings may be designed with yield, signal, or stop control for either motorists or path users depending on path volume and traffic volume on the crossing street.

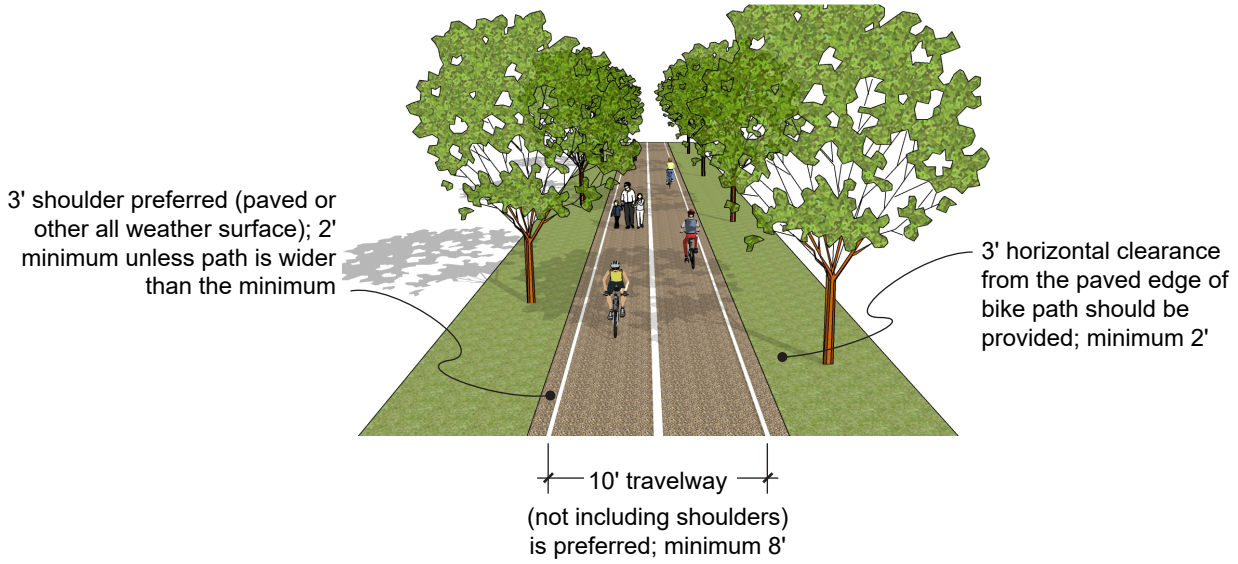



*Exhibit 1: Class 1A–Shared Use Path*

# CLASS IB: SIDEPATHS

**DESCRIPTION:**

Sidepaths are shared use paths that exist within a roadway corridor. They provide dedicated space for bidirectional travel for people walking, biking, using mobility devices, or using scooters or other micromobility devices.

**TYPICAL APPLICATION:**

Sidepaths are applicable in areas with few motor vehicle driveways or access points on roadways with operating speeds above 35 miles per hour and serving above 6,500 vehicles per day, but other treatments (generally sidewalks and Class IV facilities) are typically preferred for safety and comfort. Sidepaths can be used along high speed and/or volume roadways to provide a completely separated space outside of the roadway for people walking and biking.

**COST ESTIMATE:**

$2.6M per mile , including design and construction for the path and a planted buffer

**DESIGN CONSIDERATIONS:**

- In many situations, especially urban areas or denser or destination focused suburban areas, providing dedicated walking and biking facilities that are separate from each other is preferred to combining these modes on a sidepath.
- As motor vehicle speeds and volumes increase, providing more separation between the roadway and the path will provide higher comfort for those using the path.



*Dougherty Road, Dublin, California  Source: Kittelson and Associates, Inc*

- One key concern with providing sidepaths instead of directional bicycle facilities is the lack of driver awareness about contraflow bicycle traffic (higher speed traffic than pedestrians, which are expected to travel bidirectionally) at intersections and access points. If a motor vehicle is turning left, they are more likely to be aware of or look for traffic traveling toward them. Skip striping and signs that indicate two-way bicycle travel through crossings at intersections is key to creating awareness of the birdirectional

traffic. Exhibit 2 shows a sign used by Colorado DOT to increase awareness of sidepath users. At signalized intersections, consider detection that activates No Right Turn On Red signs and/or Yield To Pedestrians In Crosswalk signs when sidepath users are present.

- At intersections, treatments like leading pedestrian and bicycle intervals can also help increase the visibility of crossings bicyclists. Sidepaths must be appropriately designed at access points or intersections.
- At intersections, divert the sidepath away from the parallel roadway at conflict points so that it functions as a mid-block crossing and there is enough space (25 feet) for at least one vehicle to queue between the crossing and roadway intersection.
- When providing sidepaths, a critical consideration is the connection to other biking facilities. If a sidepath connects to a uni-directional bike lane at an intersection, the design of the intersection should consider the efficiency and safety of connecting bicyclists to the infrastructure they will need to use to continue on their path. Diagonal crossings can reduce the need for two-stage crossings, which can slow bicyclists and increase crossing exposure. Pavement markings and signs can also be effective in guiding bicyclists for how to make the connection and provide continuity and clarity to these transitions, which can otherwise be uncomfortable or unclear, and may encourage crossing in ways or locations that increase exposure or the number of potential conflict points. Striping on the ground to encourage separation between people walking and biking in different directions, especially at intersections or areas with higher volumes can create clarity and decrease conflicts between these modes. The maximum grade of a side path should be 5%, but the grade should generally match the grade of the roadway. Where the roadway grade exceeds 5%, the sidepath grade may as well but it must be less than or equal to the roadway grade.

*Exhibit 2: CDOT Sidepath Sign*



Note: This sign is not included in the CA MUTCD but may be considered as a candidate to apply for a request for experimentation.

**PREFERRED DESIGN AND ELEMENTS:**

- A 10 ft wide path with 2 ft shoulders on each side is preferable (14 ft total). The higher the anticipated volumes of users, the greater the width should be to accommodate these users comfortably. Curb ramps should be as wide as the path travelway to allow people walking and biking to use the ramps simultaneously.
- Pedestrian-scale lighting improves visibility for and of the users, and is particularly important at intersection crossings and in areas with access points or driveways.
- A 2 ft or greater shoulder on both sides of the path should be provided. An additional foot of lateral clearance is required by the CAMUTCD for the installation of signage or other furnishings. If objects are shorter than 3 feet tall, they may not present an obstruction for cyclists.
- Biking and walking facilities should be provided on both sides of the street to provide access to destinations along both sides of

a street. Walking facilities should be bi-directional on each side of the street. Bike lanes may be one-way, but a one-way bike path should only be provided in rare situations where there is only need for one direction of travel. If a one-way bike path is provided, adequate signage and striping is necessary to ensure it is used appropriately. A one-way bike path should be at least 5 feet in width and has the same shoulder requirements as a bi-directional path.

**REQUIRED ELEMENTS:**

- While the width may vary along a path, a path should have at least an 8 feet paved travelway with 2 feet paved or all weather surface shoulders on each side except in rare cases and for short distances.
- A wide separation should be provided between a two-way sidepath and the adjacent roadway to demonstrate to both the bicyclist and the motorist that the path functions as an independent facility for bicyclists and other users. The minimum recommended distance between a path and the roadway curb (i.e., face of curb) or edge of traveled way (where there is no curb) is 5 feet.
- Path crossings may be designed with yield, signal, or stop control for either motorists or path users depending on path volume and traffic volume on the crossing street.

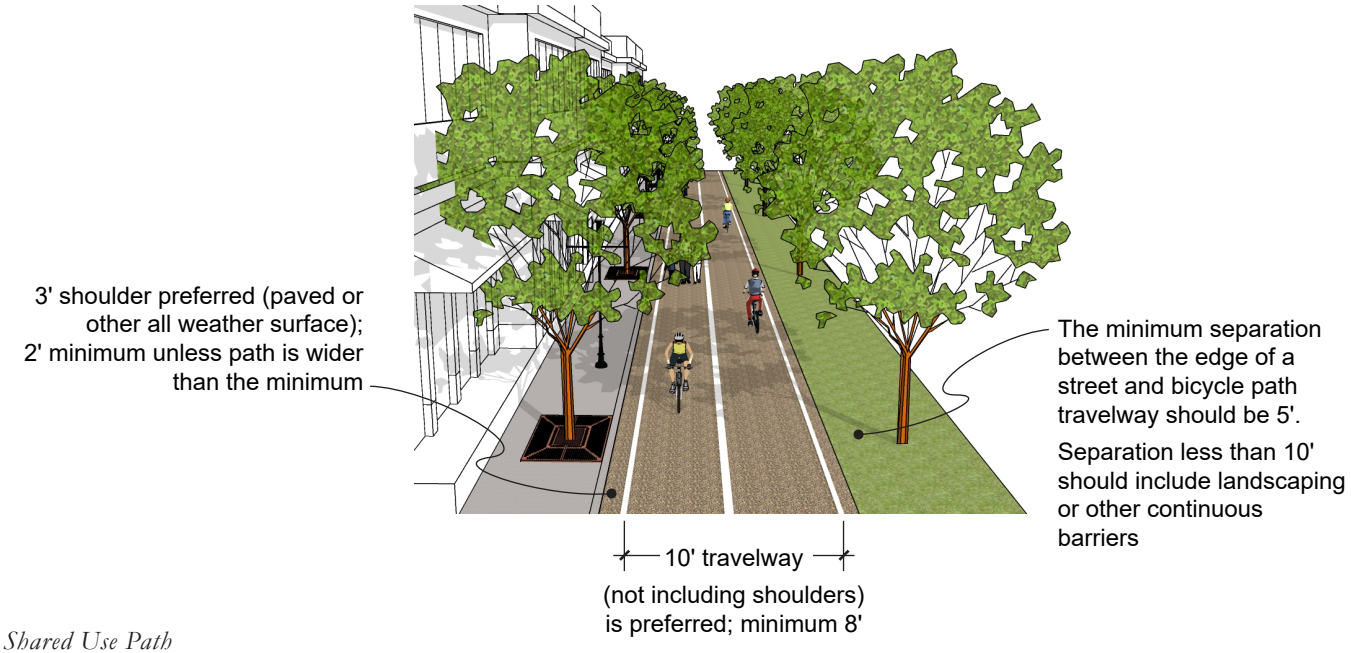



*Exhibit 3: Class IB – Shared Use Path*

# CLASS IIA AND CLASS IIB FACILITIES: BIKE LANES AND BUFFERED BIKE LANES

**DESCRIPTION:**

Bike lanes are on-street bikeways that provide a designated right-of-way for the exclusive use of bicycles. Through travel by motor vehicles or pedestrians is prohibited, but vehicle parking may be allowed on either side of the bikeway, and drivers may cross through for turning movements. Class IIA facilities are bike lanes without a buffer, while Class IIB facilities include a buffer between motor vehicle traffic and the dedicated bike lane.

**TYPICAL APPLICATION:**

Bike lanes are appropriate on streets with moderate traffic volumes and speeds: typically between 25-35 mph and 3,000 to 6,500 vehicles per day. Class IIB facilities are preferred for these conditions, but if constraints do not allow for a buffer to be added, Class IIA facilities can be provided.

**COST ESTIMATE:**

$225,000 – $5,500,000 per mile including design and construction; the lower end of the estimate is based on the ability to restripe existing roadway to add bicycle lanes, while the high end of the estimate is based on the need to widen the roadway to add facilities, including a full reconstruction of a planter strip and sidewalk.

**DESIGN CONSIDERATIONS:**

A buffer provides a more comfortable facility, so if space is available, a buffer should be provided. A buffer becomes more necessary when speeds and volumes are at the high end of the ranges provided in the "typical application" above.




*San Ramon Road, Dublin, California  Source: Kittelson and Associates, Inc*

## PREFERRED DESIGN AND ELEMENTS:

When a bike lane is placed next to active street parking, a parking-side buffer is preferred.

When steep grades are present, consider providing the next level of separation uphill (i.e., add a buffer, or physically separate the bike lane). It may be appropriate to mix facilities for opposite directions along a steep grade.

The desired minimum width of a bike lane is 6 feet. When adjacent to parking, the recommended width from curb face to the far edge of the bike lane is 14.5 feet (12 feet minimum). With high bike volumes, a 7-foot travel area width is recommended.

Storm drain catch basin grates along a Class II facility can cause a hazards for people biking. Inlets at the curb instead of on the street-surface are preferred. Grates should have rails perpendicular to the movement of bicycle traffic to keep tires from being caught in the grates. In addition, the slope of the roadway leading to the inlet must not be too severe, and the inlet and accompanying concrete box must not extend far into the bicycle lane.

At intersections with right-turn vehicle lanes, it is recommended that the bike lane transitioned to the left of the lane using dotted white lines, appropriate signage, and colored pavement.

## REQUIRED ELEMENTS:

When buffers are used, they shall be marked with 2 solid parallel white lines, at least 18 inches apart. If the buffer is at least 3 feet wide, use diagonal or chevron hatching inside. See CAMUTCD Section 9C.04 for more information.

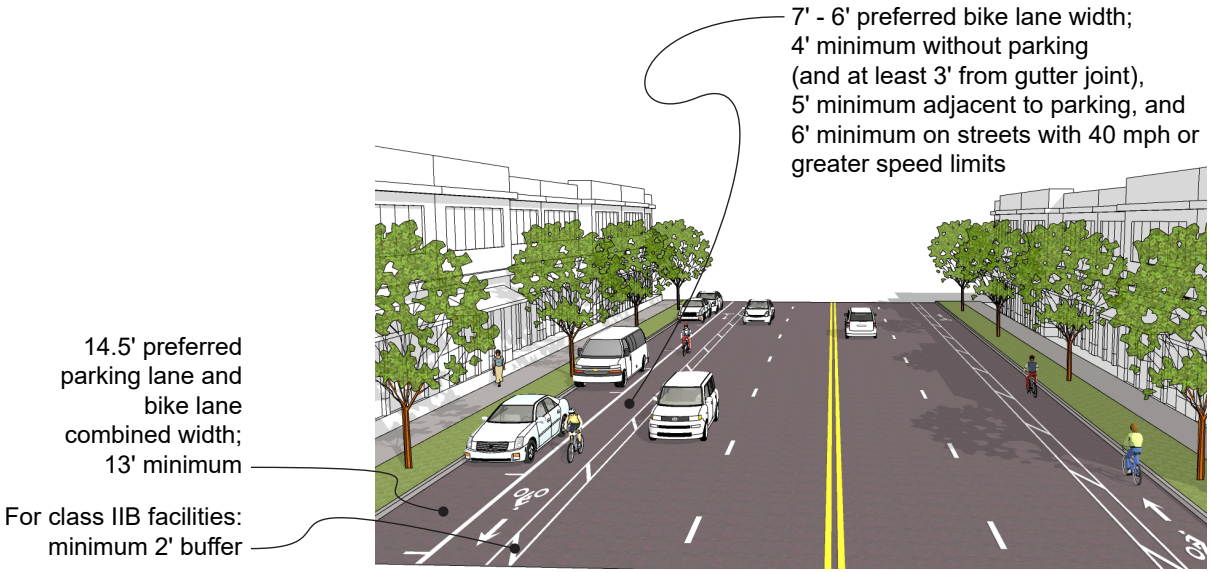



*Exhibit 4: Class II Bike Lanes*

# CLASS III BIKE ROUTES/BICYCLE BOULEVARDS

**DESCRIPTION:**

Bike routes or bicycle boulevards provide a shared travel lane with motorists. They are designated by signs or permanent markings, which may include shared-lane markings ("sharrows") to alert drivers of the shared roadway environment. Because the right-of-way is shared, vehicle speeds on Class III bikeways should be managed through the use of traffic calming or traffic diversion.

**TYPICAL APPLICATION:**

Bike routes are appropriate only in the presence of low speeds and low traffic volumes: typically below 25 miles per hour and 3,000 vehicles per day. They are most applicable on streets where no striped centerline is present. Outside of these circumstances, a designated lane or other facility is appropriate.

**COST ESTIMATE:**

$40,000 – $135,000 per mile including design and construction, depending on the need to add traffic calming elements.

**BENEFITS:**

On streets that are already low speed and volume, bike routes can provide bike connectivity for people of all ages and abilities at a relatively low cost. Sharrow pavement markings should be placed every 250 feet and after each intersection.

**DESIGN CONSIDERATIONS:**

To ensure the selected facility retains its low speed and low-volume character, bicycle boulevards should be supported with traffic calming measures and volume management measures (e.g., restricting vehicle access).




*Shafter Avenue, Oakland, California  Source: Kittelson and Associates, Inc.*

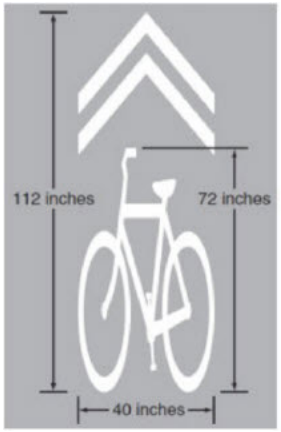



*Exhibit 5: California MUTCD (Figure 9C-9)*

The level of stress of bicycle boulevards are typically determined by major street crossings, which should be designed to promote the desired level of traffic stress (i.e., controlled).

## PREFERRED DESIGN AND ELEMENTS:

Bike routes should be direct, as bicyclists are unlikely to adhere to a path that requires significant out-of-direction travel. Ideally a bicycle boulevard would be parallel and proximate to a major vehicle route.

Signs and pavement markings should be used to identify the bike route. Wayfinding signs are recommended to guide bicyclists to destinations and through any turns in the route (refer to CAMUTCD 9B.20). Chevron pavement markings can guide bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and bicycle to travel side-by-side within the same traffic lane, and alert road users of their presence.

To create a shared street environment, it is most appropriate to use roadways that do not have a striped centerline as neighborhood bikeways.

Typically, minor streets along the bicycle boulevard should be controlled to minimize delay for bicyclists and encourage use of the bicycle boulevard.

## REQUIRED ELEMENTS:

Place sharrow pavement markings at least every 250 feet and after each intersection.

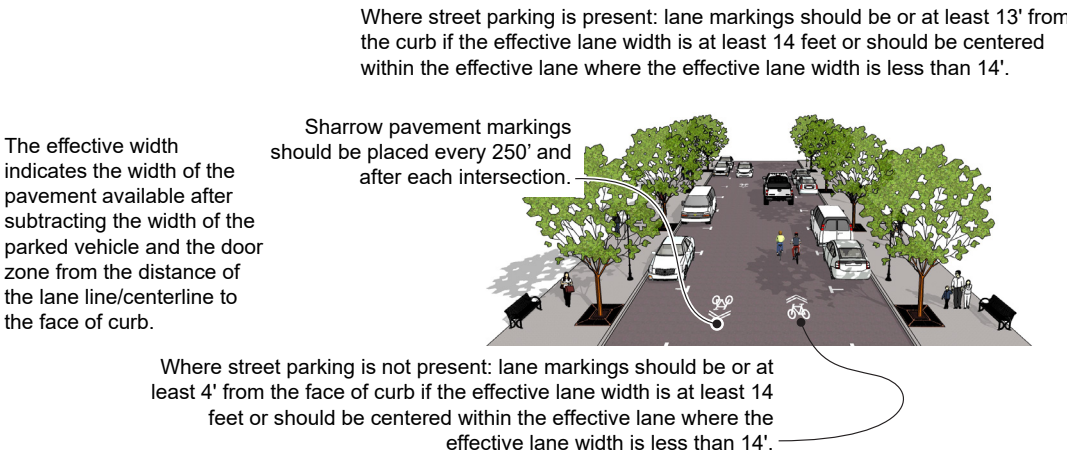
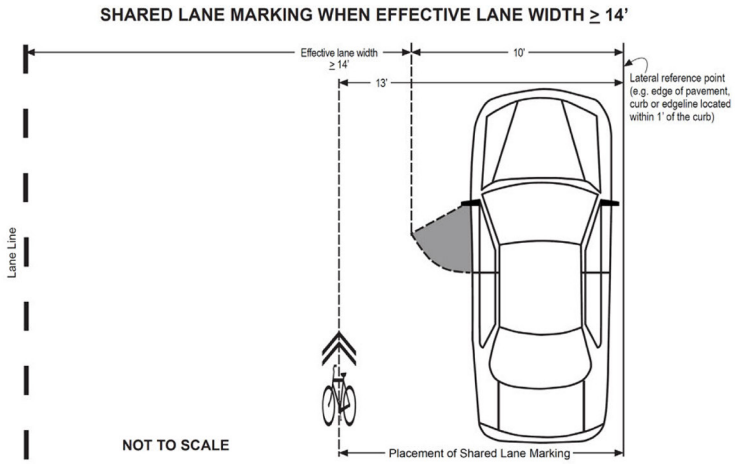



*Exhibit 6: Class III Bike Routes*



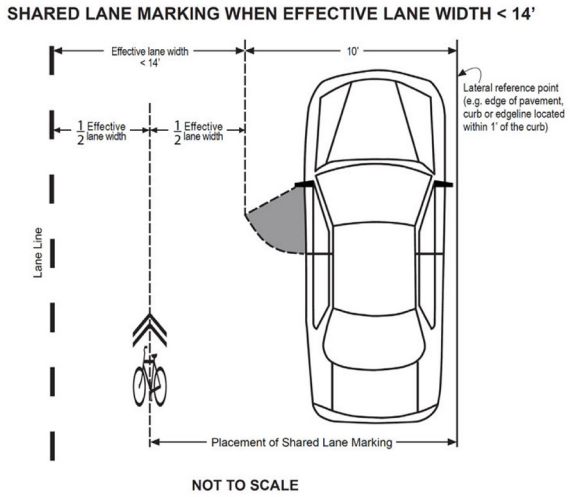




*Exhibit 7: California MUTCD 9C-108(CA)*

# CLASS IV: SEPARATED BIKEWAY/CYCLE TRACK

**DESCRIPTION:**

Separated bikeways provide physical separation from vehicular traffic. This separation may include grade separation, flexible posts, planters or other inflexible physical barriers, or on-street parking. These bikeways provide bicyclists a greater sense of comfort and security, especially in the context of high-speed roadways. Separated facilities can provide one-way or two-way travel and may be located on either side of a one-way roadway.

**TYPICAL APPLICATION:**

Separated bikeways are appropriate for higher volume and speed settings including above 35 miles per hour and serving 6,500 or more vehicles per day.

**COST ESTIMATE:**

$1,100,000 – $5,700,000 per mile including design and construction; the lower end of the estimate is based on the ability to reorganize existing roadway to add separated bike lanes, while the high end of the estimate is based on the need to widen the roadway to add facilities, including a full reconstruction of a planter strip and sidewalk.



*San Diego, California Source: Kittelson and Associates, Inc.*



*Village Parkway, Dublin, California Source: City of Dublin*

## DESIGN CONSIDERATIONS:

Separated bikeways are appropriate at speeds and volumes where bike lanes or buffered bike lanes do not adequately address the comfort needs of the Interested but Concerned biking population per the FHWA Bikeway Selection Guide. These facilities are more appropriate than shared-use paths if pedestrian and bicyclist volumes are expected to be relatively high or there are significant access points or driveways along a road.

Two-way separated bikeways are appropriate along routes with many destinations on only one-side of the road, incidences of wrong-way riding, along one-way streets, or in locations where they facilitate connection to a shared-use path.

## PREFERRED DESIGN AND ELEMENTS:

The type of separator can impact the comfort of bicyclists along a separated bikeway. Elements with higher mass and height can provide higher comfort. Planted separators can also improve the aesthetics along a corridor.

Along separated bikeways, intersections may provide the most exposure to cyclists. Including protected intersection treatments can improve the comfort along the entire route and make the facility more appropriate for people of all ages and abilities.

## REQUIRED ELEMENTS:

Physical separation may be provided by flexible delineators, parked cars, bollards, planters, or parking stops. When parked cars provide separation, a buffer width of at least 3 feet should be provided for bicyclists to avoid the "door zone." Delineation should be intentional to discourage people driving from entering the bikeway and to indicate the location of the parking lane.

The riding area for one-way lanes should be at least 5 feet wide (7 feet if along an uphill grade). For two-way bikeways, the preferred width is 12 feet (10 feet minimum).

In constrained environments, consider removing a travel lane, reducing the bike lane width, or reducing the sidewalk buffer width. Sidewalk accessibility requirements must be maintained, and adequate street buffer is essential for the safety of bicyclists.

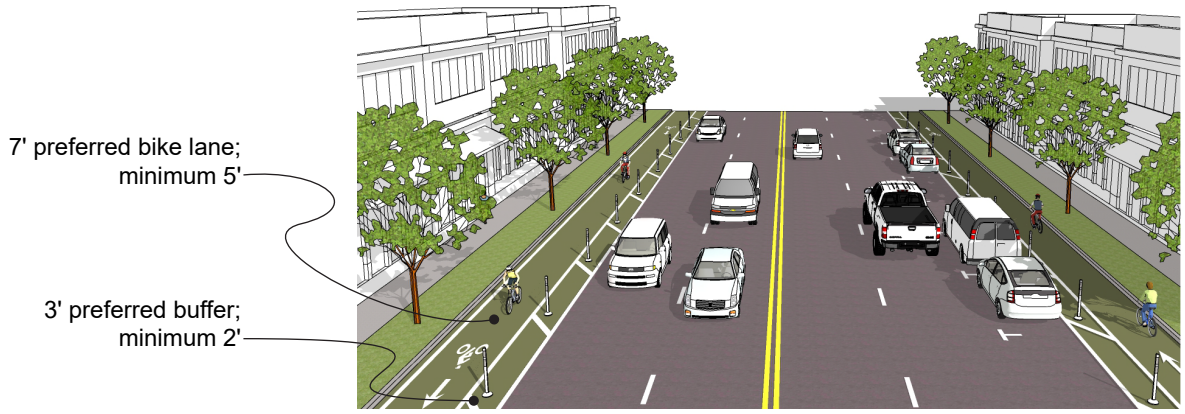



*Exhibit 8: Class IV Cycle Track*

# ACCESSIBLE PEDESTRIAN SIGNALS

**DESCRIPTION:**

An accessible pedestrian signal (APS) is a pedestrian signal that uses audible tones or messages and/or vibrotactile surfaces to communicate crossing information (e.g., WALK and DON'T WALK intervals) to those walking who are vision impaired or blind. Section 504 of the Rehabilitation Act requires newly constructed and reconstructed public facilities to be accessible to all members of the public. APS should be installed wherever pedestrian signals are installed.

**TYPICAL APPLICATION:**

The factors that make crossing at a signalized location difficult for pedestrians who have visual disabilities include: quiet car technology including through electric vehicles, high right turn on red or continuous right-turn movements, complex signal operations, traffic circles, wide streets, or low traffic volumes that make it difficult to discern signal phase changes.

APS should be provided everywhere a signalized crossing opportunity is provided, but should be provided in particular at signalized intersections that may present difficulties for pedestrians who have visual disabilities, including those listed above. Greater consistency can provide more expectations.

**COST ESTIMATE:**

Costs range from $550 to $1,150 per signal in locations where pedestrian signal poles already exist; up to eight APS units are needed per intersection.

**BENEFITS:**

Without APS, those with visual disabilities generally determine if they're able to cross a street by initiating a crossing when they hear traffic stop and traffic perpendicular to them move, but this does not always provide sufficient information needed to safely or efficiently cross. When it does provide accurate information, it may require the pedestrian to need to wait an additional signal cycle. APS has been shown to reduce the number of crossings during a DON'T WALK phase, provide more accurate judgements of the WALK phase, and reduce delay of crossing. It can also reduce delay and reduce conflicts due to a misunderstanding of crossing opportunities.

**DESIGN CONSIDERATIONS:**

When APS cannot be implemented everywhere, it should be prioritized in areas with the following characteristics:

- Very wide crossings,
- Crossings of major streets where minor streets have minimal or intermittent traffic,
- Complex or uncommon intersection types,
- Low volumes of through vehicles,
- High volumes of turning vehicles,
- Split phase signal timing,
- Exclusive pedestrian phasing, Leading pedestrian intervals, and
- Proximity to major pedestrian destinations like BART stations, parks, downtown, etc.

## PREFERRED DESIGN AND ELEMENTS:

An alert tone may be used to alert pedestrians to the beginning of the walk interval.

Locator tones should help those with visual impairment find pushbuttons, and APS should be clear to which crossing leg the audible signal is associated. It is preferred for APS pushbutton poles to be at least 10 feet apart to improve clarity for which crossing leg is associated with each audible signal. Including the name of the street to be crossed in an accessible format, such as Braille or raised print on the pushbutton, can help provide clarity for which crossing the APS is associated.

Pushbuttons for accessible pedestrian signals should be located as close as possible to the crosswalk line furthest from the center of the intersection and as close as possible to the curb ramp. In addition to being more useful, the closer to the crossing that it is located, the quieter it can be. It should be within 5 feet of the crosswalk extended or 10 feet of the edge of curb, shoulder, or pavement.

## REQUIRED ELEMENTS*:

- Where two accessible pedestrian signals are separated by a distance of at least 10 feet, the audible walk indication shall be a percussive tone. Where two accessible pedestrian signals on one corner are not separated by a distance of at least 10 feet, the audible walk indication shall be a speech walk message.
- If speech walk messages are used to communicate the walk interval, they shall provide a clear message that the walk interval is in effect, as well as to which crossing it applies. Speech walk messages shall be used only at intersections where it is technically infeasible to install two accessible pedestrian signals at one corner separated by a distance of at least 10 feet.
- If two accessible pedestrian pushbuttons are placed less than 10 feet apart or on the same pole, each accessible pedestrian pushbutton shall be provided with the following features: Pushbutton locator tone, tactile arrow, speech walk message, speech pushbutton information message
- If the pedestrian clearance time is sufficient only to cross from the curb or shoulder to a median of sufficient width for pedestrians to wait and accessible pedestrian detectors are used, an additional accessible pedestrian detector shall be provided in the median.

## FOR MORE INFORMATION:

NCHRP Web-Only Document 150:
Accessible Pedestrian Signals: A Guide to Best Practices
https://www.trb.org/Publications/Blurbs/164696.aspx

California Manual on Uniform Traffic Control Devices Section 4E.09 https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ca-mutcd/rev6/camutcd2014-rev6.pdf

* Check the California MUTCD Part 4 for current guidance

# CROSSING SELECTION

## DESCRIPTION:

Providing visible pedestrian crossings is critical to allowing those who travel by foot or mobility device to have access to their destinations. Uncontrolled pedestrian crossing locations generally correspond to higher pedestrian crash rates than controlled locations, often due to inadequate pedestrian crossing accommodations (FHWA, 2018). The type of crossing provided should be appropriate for the context of the roadway that is being crossed. The higher the speeds, volumes, and number of lanes on the roadway, the greater the need for higher visibility crossing elements. Providing regular crossings with the correct crossing features based on the roadway context supports a safe, convenient, and comfortable walking environment, leading to more people walking to meet everyday needs and thus contributing to the health, sustainability, and vibrancy of a community.

In addition to the crossing countermeasures provided, curb ramps should be provided at all crossings. At intersections, directional curb ramps should be provided, which means providing dual curb ramps at most intersections.

## TYPICAL APPLICATION:

Mid-block and unsignalized intersections; crossings should be provided with regular spacing and should especially be provided to access key destinations like transit stops, schools, trailheads, parks, and grocery stores. Different crossing types and countermeasures are appropriate based on the roadway context. Exhibit 9 provides the appropriate crash countermeasures by roadway feature.

*Exhibit 9: Application of pedestrian crash countermeasures by roadway feature*

| Roadway Configuration | Posted Speed Limit and AADT | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Vehicle AADT <9,000 | | | Vehicle AADT 9,000–15,000 | | | Vehicle AADT >15,000 | | |
| | ≤30 mph | 35 mph | ≥40 mph | ≤30 mph | 35 mph | ≥40 mph | ≤30 mph | 35 mph | ≥40 mph |
| **2 lanes** (1 lane in each direction) | ● 2 4 5 6 | ● 5 6 7 9 | ○ 5 6 ❼ ❾ | ● 4 5 6 | ● 5 6 7 9 | ○ 5 6 ❼ ❾ | ● 4 5 6 7 9 | ○ 5 6 7 9 | ○ 5 6 ❾ |
| **3 lanes with raised median** (1 lane in each direction) | ● 2 3 4 5 | ● ❸ 5 7 9 | ○ ❸ 5 ❼ ❾ | ○ 3 4 5 7 9 | ○ ❸ 5 ❼ ❾ | ○ ❸ 5 ❼ ❾ | ○ ❸ 4 5 7 9 | ○ ❸ 5 ❼ ❾ | ○ ❸ 5 ❾ |
| **3 lanes w/o raised median** (1 lane in each direction with a two-way left-turn lane) | ● 2 3 4 5 6 7 9 | ● ❸ 5 6 7 9 | ○ ❸ 5 6 ❾ | ○ 3 4 5 6 7 9 | ○ ❸ 5 6 ❼ ❾ | ○ ❸ 5 6 ❾ | ○ ❸ 4 5 6 7 9 | ○ ❸ 5 6 ❾ | ○ ❸ 5 6 ❾ |
| **4+ lanes with raised median** (2 or more lanes in each direction) | ● ❸ 5 7 8 9 | ● ❸ 5 7 8 9 | ○ ❸ 5 8 ❾ | ○ ❸ 5 7 8 9 | ○ ❸ 5 ❼ 8 9 | ○ ❸ 5 8 ❾ | ○ ❸ 5 ❼ 8 9 | ○ ❸ 5 8 ❾ | ○ ❸ 5 8 ❾ |
| **4+ lanes w/o raised median** (2 or more lanes in each direction) | ● ❸ 5 6 7 8 9 | ○ ❸ 5 6 7 8 9 | ○ ❸ 5 6 8 ❾ | ○ ❸ 5 6 7 8 9 | ○ ❸ 5 6 ❼ 8 9 | ○ ❸ 5 6 8 ❾ | ○ ❸ 5 6 ❼ 8 9 | ○ ❸ 5 6 8 ❾ | ○ ❸ 5 6 8 ❾ |

Given the set of conditions in a cell,

- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1. High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2. Raised crosswalk
3. Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4. In-Street Pedestrian Crossing sign
5. Curb extension
6. Pedestrian refuge island
7. Rectangular Rapid-Flashing Beacon (RRFB)**
8. Road Diet
9. Pedestrian Hybrid Beacon (PHB)**

*Refer to Chapter 4, 'Using Table 1 and Table 2 to Select Countermeasures,' for more information about using multiple countermeasures.

**It should be noted that the PHB and RRFB are not both installed at the same crossing location.

This table was developed using information from: Zegeer, C.V., J.R. Stewart, H.H. Huang, P.A. Lagerwey, J. Feaganes, and B.J. Campbell. (2005). Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines. FHWA, No. FHWA-HRT-04-100, Washington, D.C.; FHWA. Manual on Uniform Traffic Control Devices, 2009 Edition. (revised 2012). Chapter 4F, Pedestrian Hybrid Beacons. FHWA, Washington, D.C.; FHWA. Crash Modification Factors (CMF) Clearinghouse. http://www.cmfclearinghouse.org/; FHWA. Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE). http://www.pedbikesafe.org/PEDSAFE/; Zegeer, C., R. Srinivasan, B. Lan, D. Carter, S. Smith, C. Sundstrom, N.J. Thirsk, J. Zegeer, C. Lyon, E. Ferguson, and R. Van Houten. (2017). NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments. Transportation Research Board, Washington, D.C.; Thomas, Thirsk, and Zegeer. (2016). NCHRP Synthesis 498: Application of Pedestrian Crossing Treatments for Streets and Highways. Transportation Research Board, Washington, D.C.; and personal interviews with selected pedestrian safety practitioners.

*Source: FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations*

# HIGH VISIBILITY CROSSWALK MARKINGS, PARKING RESTRICTIONS ON THE CROSSWALK APPROACH, ADEQUATE NIGHTTIME LIGHTING LEVELS, AND CROSSING WARNING SIGNS

## HIGH VISIBILITY CROSSWALK



*Iron Horse Trail and Amador Valley Boulevard, Dublin, California*
*Source: Kittelson and Associates, Inc*

## PEDESTRIAN REFUGE ISLAND



*Amador Valley Boulevard and San Ramon Road Dublin, California.*
*Source: Kittelson and Associates, Inc*

## RAISED CROSSWALK



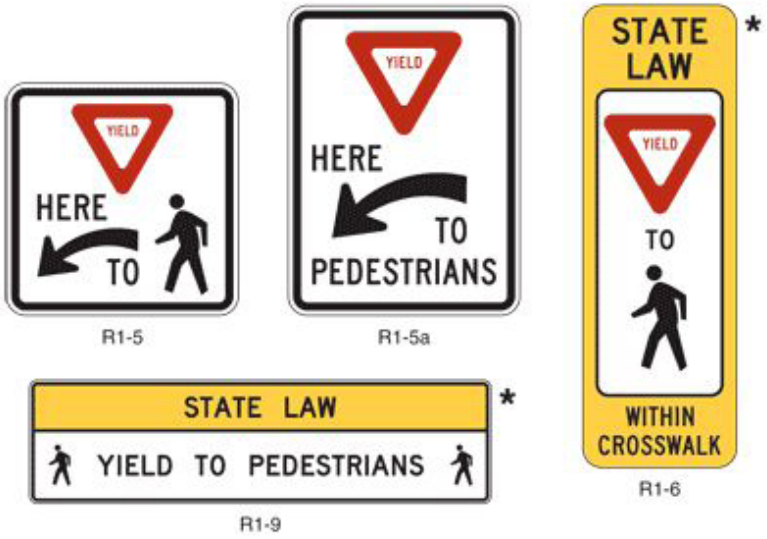
*Source: Federal Highway Administration*

## RECTANGULAR RAPID-FLASHING BEACON



*Amador Valley Boulevard and Wildwood Road, Dublin, California*
*Source: City of Dublin*

## ADVANCE YIELD HERE TO (STOP HERE FOR) PEDESTRIANS SIGN AND YIELD/STOP



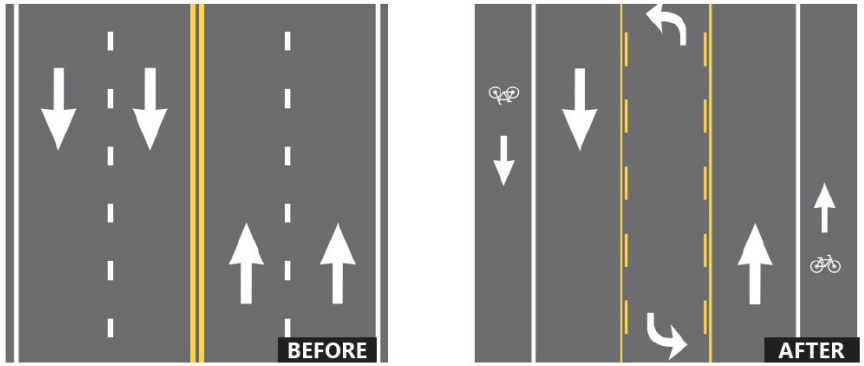

*Source: MUTCD*

## IN STREET PEDESTRIAN CROSSING SIGN



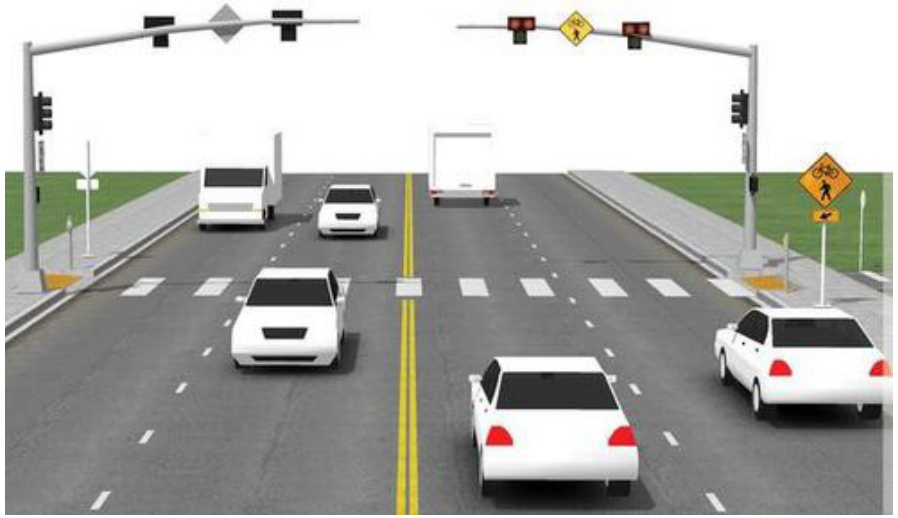
*Alcosta Boulevard, San Ramon, California*
*Source: Google Streetview*

## ROAD DIET (REALLOCATING SPACE WITHIN THE ROADWAY FOR OTHER USES)




*Source: Federal Highway Administration*

## PEDESTRIAN HYBRID BEACON



*Source: NACTO*

## CURB EXTENSION



*Amador Valley Boulevard and Wildwood Road, Dublin, California.*
*Source: City of Dublin*

# BICYCLE FACILITIES THROUGH INTERSECTIONS

In locations where there is dedicated space for bicyclists along a roadway, it is important to maintain the bicycle facility through the intersection to clearly provide the intended use of the space, enhance bicyclist comfort, increase motorist yielding behavior, and highlight conflict zones. There are several elements that can support bicyclist movements through intersections including bicycle lane markings, skip striping, green paint, bike boxes, two-stage left turn boxes, protected intersection elements , intersection approach considerations, and traffic control considerations.



*2nd Avenue, Seattle, Washington. Source: Kittelson & Associates, Inc.*

# INTERSECTION CROSSINGS MARKINGS

**DESCRIPTION:**

Intersection crossing markings indicate where a bicyclist will be travelling through an intersection to clearly mark the intended use, enhance cyclist comfort, increase motorist yielding behavior, and highlight conflict zones. They are generally made up of green "skip striping" paint, green bike lane paint, and/or bicycle lane markings.

**TYPICAL APPLICATION:**

Through intersections or across driveways

**COST ESTIMATE:**

$1,500 - $4,000 per approach

**DESIGN RECOMMENDATIONS:**

When colored paint is used for bicycle facilities, it should be green to avoid confusion with other traffic control markings. For more information, see CA MUTCD Section 9C.04 Figure 9C-103(A). , MUTCD Section 3B.08, or https://nacto.org/publication/urban-bikeway-design-guide/intersection-treatments/intersection-crossing-markings/.

Green pavement is not currently allowed in the extension area through the intersection by MUTCD.

https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/ctcdc/ctcdc-agenda-item-21-22-a11y.pdf



*Dublin Boulevard, Dublin, California. Source: Kittelson and Associates, Inc.*

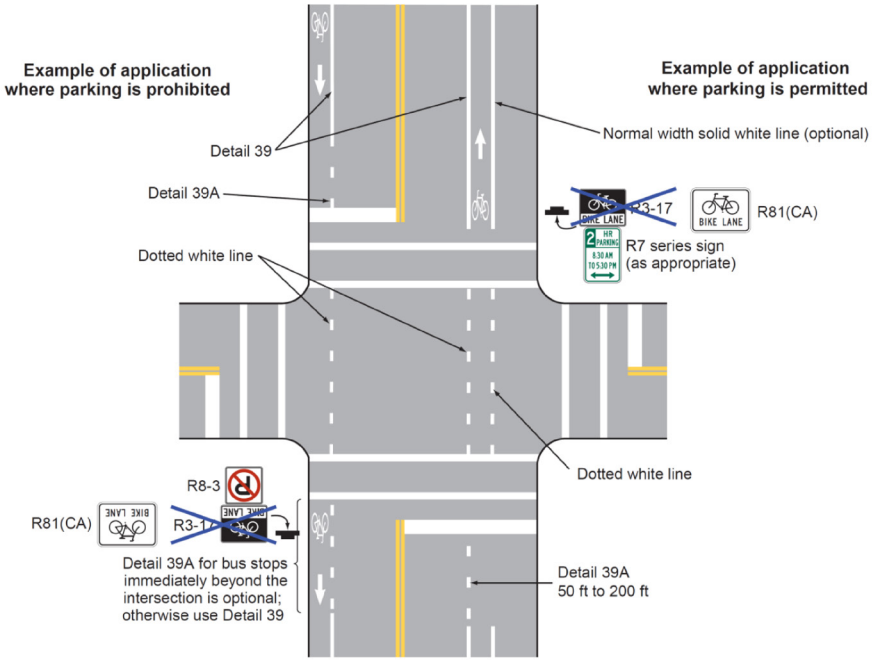



*Exhibit 10: CA Traffic Control Devices Committee Editorial Changes to the CA MUTCD*

*Source: NACTO*

# BIKE BOXES

**DESCRIPTION:**

A bike box is a dedicated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

**TYPICAL APPLICATION:**

Signalized intersections with higher volumes of bicyclists and right-turning vehicles, typically along Class II or Class III facilities.

**COST ESTIMATE:**

$1,000 each

**DESIGN RECOMMENDATIONS:**

- "Wait Here" pavement markings can be placed in advance of the bike box as reinforcement for drivers not to impede the bike box
- A STOP HERE ON RED (MUTCD R10-6 or R10-6a) sign can be used at the advance stop bar, with an EXCEPT BICYCLES (MUTCD R3-7bp) plaque below.
- Green paint highlights bike boxes for visibility.
- Right turn on red and bike boxes are not compatible. Use approved MUTCD "NO RIGHT TURN ON RED" signs shall be used (R10-11).
- A bike box shall include an advance stop line at least 10 feet in advance of the intersection stop line, with at least one bicycle pavement marking in the box.



*Flanders Street, Portland, Oregon. Source: Kittelson and Associates, Inc.*

**FOR MORE INFORMATION:**

FHWA's Interim Approval for Optional Use of an Intersection Bicycle Box (IA-18)

# TWO STAGE BICYCLE TURN BOXES

**DESCRIPTION:**

Two-stage bicycle turn boxes offer bicyclists a dedicated space to make left turns at multi-lane signalized intersections from a right side cycle track or bike lane or right turns from a left side cycle track or bike lane.

**TYPICAL APPLICATION:**

Two-stage bicycle turn boxes are commonly used to facilitate a left turn across multiple lanes of traffic at a signalized intersection. They may also be used for turns at midblock crossing locations, for right turns from a left-side bike lane, or to facilitate a proper angle across tracks (streetcar, train, etc.)

**COST ESTIMATE:**

$1,000 each

**DESIGN RECOMMENDATIONS:**

The turn box should be sized to provide room for waiting cyclists, up to 10 feet wide and 6.5 feet deep but not less than 3 feet deep. Appropriate signage may be used to indicate the two-stage turn is provided (MUTCD D11-20L or D11-20R).

The bicycle symbol and left-turn arrow marking shall be provided within the box, which shall be bounded by solid white lines on all sides.

**FOR MORE INFORMATION:**

FWHA's Interim Approval for Option Use of Two-Stage Bicycle Turn Boxes (IA-20)



*Meade Avenue, San Diego, California  Source: Kittelson and Associates, Inc.*

# PROTECTED INTERSECTION TREATMENTS

**DESCRIPTION:**

A protected intersection provides physical separation for bicyclists and pedestrians up to and through an intersection and provides bicyclists and pedestrians with the right of way over turning vehicles. The physical separation between people driving and people biking or walking creates a setback, which is intended to control speeds, promote visibility, and reduce conflicts among motorists, cyclists, and pedestrians. Protected intersections generally also provide shorter crossing distances for people walking and biking.

**TYPICAL APPLICATION:**

Intersections with higher speeds and volumes, especially at intersections where Class IV bikeways are present, or a high incidence of bicycle or pedestrian crashes.

**COST ESTIMATE:**

$1,000,000 per intersection

**DESIGN RECOMMENDATIONS:**

- Intersection crossing markings for bicyclists and pedestrians provide directional guidance for where each should cross. Green cross bike or skip striping and/or bike markings can provide clear guidance to people biking and allow drivers to anticipate bicyclists in this space.
- Tighter curb return radii (10 feet to 15 feet) should be used to discourage fast turning movements.




*Meade Avenue, San Diego, California. Source: Kittelson and Associates, Inc.*

- Wider pedestrian islands support higher volumes of people walking and biking. Pedestrian crossing islands should be at least 6 feet wide to provide an accessible waiting area.
- A modified "Turning Vehicles Yield to Bikes and Pedestrians" sign (R10-15) is recommended where a signalized intersection allows right turns with bicycle and pedestrian movements.

**FOR MORE INFORMATION:**

Reference the following NACTO guidance: https://nacto.org/publication/dont-give-up-at-the-intersection/protected-intersections

# INTERSECTION APPROACH CONSIDERATIONS

**DESCRIPTION:**

A bicycle lane approach to intersections can take different forms depending on the type of lane, existence of turn lanes, and other roadway features. In locations where a right turn lane is added, the roadway can include a mixing zone in the approach to keep bicyclists to the left of the right-turning vehicles. Depending on the geometry of the roadway, the bicycle lane may maintain as a straight line or may transition with a diagonal at the beginning of the turn lane.

**TYPICAL APPLICATION:**

Intersections with right turn lanes adjacent to a bike lane.

**COST ESTIMATE:**

$1,500 - $4,000 per approach

**DESIGN RECOMMENDATIONS:**

- The merge/conflict area can be highlighted with markings, including green paint and skip striping.
- The right turn lane should be as short as practical to encourage slow vehicle speeds when merging across the bike lane. The merge area should also be no more than 100 feet long for the same reasons.
- A through bicycle lane shall not be positioned to the right of a right-turn lane (MUTCD 9C.04) unless the movements are separated by different traffic signal phases.
- Use "BEGIN RIGHT TURN LANE YIELD TO BIKES" (MUTCD R4-4) at the beginning of the right turn lane and merge area.



*Source: NACTO*

- In cases where space is especially constrained (13 feet is not available for both a right turn lane and bike lane), a shared right turn/through bike lane may be provided.

**FOR MORE INFORMATION:**

AASHTO Guide for the Development of Bicycle Facilities, 2012, pgs 422 - 427

# TRAFFIC SIGNAL CONSIDERATIONS

## DESCRIPTION:

Bicycle signals offer a bicycle-exclusive phase at signalized intersections. Bicycle signals can improve safety and operations at intersections by removing bicycle and vehicle time conflicts in time or defining different needs from other road users.

## TYPICAL APPLICATION:

Bicycle signals are most appropriate at locations with high bicycle and right-turning vehicle volumes, and often is used to provide a through phase for bicyclists separate from the right-turn phase for motorists. A bicycle signal can be triggered by loop detection, push-buttons, or video detection. Automatic bike detection discourages red-light running.

## COST ESTIMATE:

$27,000 - $78,000

## DESIGN RECOMMENDATIONS:

- At intersections with right-turning vehicles, right-turns on red should also be prohibited to prevent conflict with the bicycle movement.
- MUTCD Figure 9C-7 provides guidance on bicycle detector pavement markings.
- Some existing bicycle signal designs shields the bicycle signal from drivers' line of sight to avoid potential confusion.
- A bicycle signal face should be separated vertically or horizontally from the nearest motor vehicle traffic signal face for the same approach by at least 3 feet. (IA-16)
- Section 4D.105(CA) Bicycle/Motorcycle Detection Standard: 01 All new limit line detector installations and modifications to the existing limit line detection on a public or private road or driveway intersecting a public road shall either provide a Limit Line Detection Zone in which the Reference Bicycle Rider is detected or be placed on permanent recall or fixed time operation. Refer to CVC 21450.5.



*Source: NACTO*

## FOR MORE INFORMATION:

- FHWA's Interim Approval for Optional Use of Bicycle Signal Faces (IA-16)

# BICYCLE PARKING

**DESCRIPTION:**

Short-term and long-term bicycle parking is an essential part of a successful bicycle system. A lack of secure and convenient bicycle storage can discourage cycling.

**CONTEXT:**

Short-term bicycle parking is intended to be used for a few hours at most and is provided in public space. Often this is provided along the curb or furniture zone of a street. -

Long-term bicycle parking is intended to be used for longer than several hours. It should be sheltered or indoors to provide greater security.- A bike corral, or multiple bike parking spaces on the street along the curb, can be an efficient use of space. Bike corrals can store up to 12 bicycles in a single vehicle parking space.

**TYPICAL APPLICATION:**

Bicycle parking should be provided at or near all destinations to allow people to bike to access those destinations. The amount and type of bicycle parking should be dependent upon the type of destination.

**COST ESTIMATE:**

$27,000 - $78,000



*Bike Parking at Dublin Library, Dublin, California. Source: City of Dublin*

**DESIGN RECOMMENDATIONS:**

- Bike racks should be securely fastened to the ground to prevent a bike from being stolen by removing the rack. Adding a crossbar below where the bike would likely be fastened to reduce the ability to remove the bike rack from the ground to slip a lock off and including internal cabling to make it more challenging to cut through can further reduce theft and increase the security of the bike parking system.
- Bike racks should accommodate U-shaped locks and support the bicycle at two points above its center of gravity to allow the frame and both wheels to be locked.
- Long-term parking should be included as a requirement in all buildings where people travel to spend more than several hours, including multi-family housing, places of work, schools, hospitals, and other destinations.
- Long-term parking requirements should be based on household units, trip generation, employees per square footage, and visitation rates. It should be easy to find, direct, and accessible without stairs. It is preferred that it can also be accessed by use of automatic doorways and entryways to limit the need for someone to open a door and hold their bike, which may not be possible.



*Long term bicycle parking (BikeLink bike lockers) at the West Dublin BART Station, Dublin, California. Source: City of Dublin*

- Long-term parking should consider accommodating e-bike charging by locating electrical outlets near the parking spots and should include spaces for longer bicycles, including cargo bikes or bike trailers. If mounted bicycle parking is provided, there should also be horizontal floor parking available for larger bikes or those that can not lift their bike. For double-decker bicycle racks, a lift-assisted mechanism should be provided to access the upper tier.



# RESOLUTION NO. 22-15

## A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF DUBLIN

## RECOMMENDING THAT THE CITY COUNCIL ADOPT THE BICYCLE AND PEDESTRIAN PLAN AND FIND THE PLAN EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

**WHEREAS,** on July 17, 2007, the City Council adopted the Bikeways Master Plan and associated amendments to the Dublin General Plan and various Specific Plans for consistency with the Bikeways Master Plan; and

**WHEREAS,** on October 7, 2014, the City Council adopted the Bicycle and Pedestrian Master Plan (2014 Plan) that combined the update to the 2007 Bikeways Master Plan and the City's first Pedestrian Plan into a comprehensive document that provides policies, network plans, prioritized project lists, support programs and best practice design guidelines for bicycling and walking in Dublin; and

**WHEREAS,** on October 7, 2014, the City Council also adopted amendments to the Dublin General Plan, Eastern Dublin Specific Plan, Dublin Historic Village Area Specific Plan, Downtown Dublin Specific Plan, and Dublin Zoning Ordinance to ensure that the text and maps remain consistent with the 2014 Bicycle and Pedestrian Master Plan; and

**WHEREAS,** Policy 1-3 of the Bicycle and Pedestrian Master Plan recommends an update every five years to reflect best practices in bicycle and pedestrian policy and design, changing community interests and needs, and to remain eligible for Bicycle Transportation Account (BTA) funding; and

**WHEREAS,** the draft Bicycle and Pedestrian Plan updates and replaces the 2014 Plan by building upon the 2014 Plan's goals and recommendations and by using new guidance documents. The update results in infrastructure, program, and policy recommendations that support walking and biking in Dublin; and

**WHEREAS,** it was determined that no further amendments to the Dublin General Plan and Specific Plans are required at this time; and

**WHEREAS**, the update to the 2014 Plan has been renamed the Bicycle and Pedestrian Plan (Plan); and

**WHEREAS,** in accordance with the California Environmental Quality Act (CEQA) certain projects require review for environmental impacts and, when applicable, environmental documents to be prepared; and

**WHEREAS,** pursuant to the requirements of CEQA, the Bicycle and Pedestrian Plan was examined to determine if the environmental review is required. The analysis concluded that the Bicycle and Pedestrian Plan is exempt from CEQA review as follows (Exhibit B CEQA Exemption Eligibility Memorandum, dated October 2022):

- The Bicycle and Pedestrian Plan qualifies for the statutory exemption pursuant to Public Resource Code Section 21080.20 Bicycle Transportation Plans because it consists of bicycle and pedestrian transportation improvements for the urbanized City of Dublin.
- Some of the implementation measures and projects identified in the Bicycle and Pedestrian Plan are also statutorily exempt under Public Resources Codes section 21080.25.
- In addition, the Bicycle and Pedestrian Plan and some implementation projects under the Plan qualify for the following categorical exemptions and none of the exceptions under CEQA Guidelines 15300.2 apply: CEQA Guidelines Section 15301 Existing Facilities, CEQA Guidelines Section 15303 New Construction or Conversion of Small Structures, and CEQA Guidelines Section 15304, Minor Alterations to Land; and

**WHEREAS,** a Staff Report, dated November 8, 2022, and incorporated herein by reference, was submitted to the City of Dublin Planning Commission recommending City Council approval of the Bicycle and Pedestrian Plan and CEQA exemption; and

**WHEREAS,** the Planning Commission held a properly noticed public hearing on the Bicycle and Pedestrian Plan and CEQA exemption on November 8, 2022, at which time all interested parties had the opportunity to be heard; and

**WHEREAS,** the Planning Commission did hear and consider the Bicycle and Pedestrian Plan and CEQA exemption and related comments and responses, all said reports, recommendations and testimony at the hearing; and

**WHEREAS**, the location and custodian of the documents or other material which constitute the record of proceedings for the Bicycle and Pedestrian Plan is the City of Dublin Public Works Department, 100 Civic Plaza, Dublin, CA 94568.

**NOW, THEREFORE, BE IT RESOLVED** that the foregoing recitals are true and correct and made a part of this Resolution.

**BE IT FURTHER RESOLVED** that on the basis of the findings above and the record as a whole (including Exhibit B CEQA Exemption Eligibility Memo), the City of Dublin Planning Commission does hereby recommend the City Council find that the project is exempt from CEQA.

**BE IT FURTHER RESOLVED** that the City of Dublin Planning Commission does hereby recommend the City Council adopt the Resolution (Exhibit A) and the attached Bicycle and Pedestrian Plan (Exhibit C).

**PASSED, APPROVED, AND ADOPTED** this 8th day of November 2022 by the following vote:

**AYES: Grier, Qaadri, Thalblum, Tyler, Wright**

**NOES:**

**ABSENT:**

**ABSTAIN:**

DocuSigned by:
Cathryn Grier
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Planning Commission Chair

**ATTEST:**

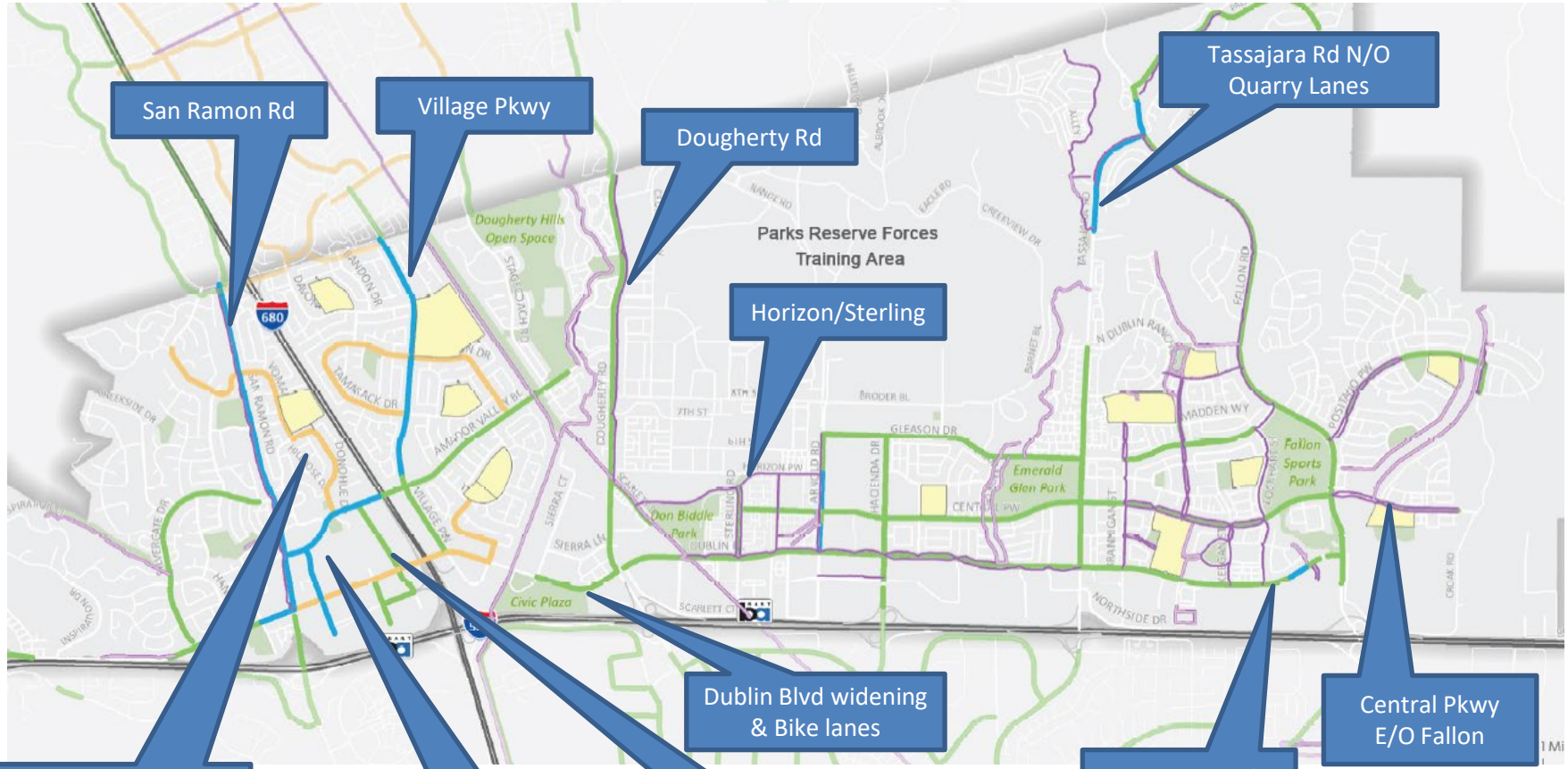
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Kristie Wheeler
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Assistant Community Development Director

DUBLIN
CALIFORNIA

# 6.1 - Bicycle and Pedestrian Plan Update

January 10, 2023
City Council

# Completed Projects – 2014 Plan



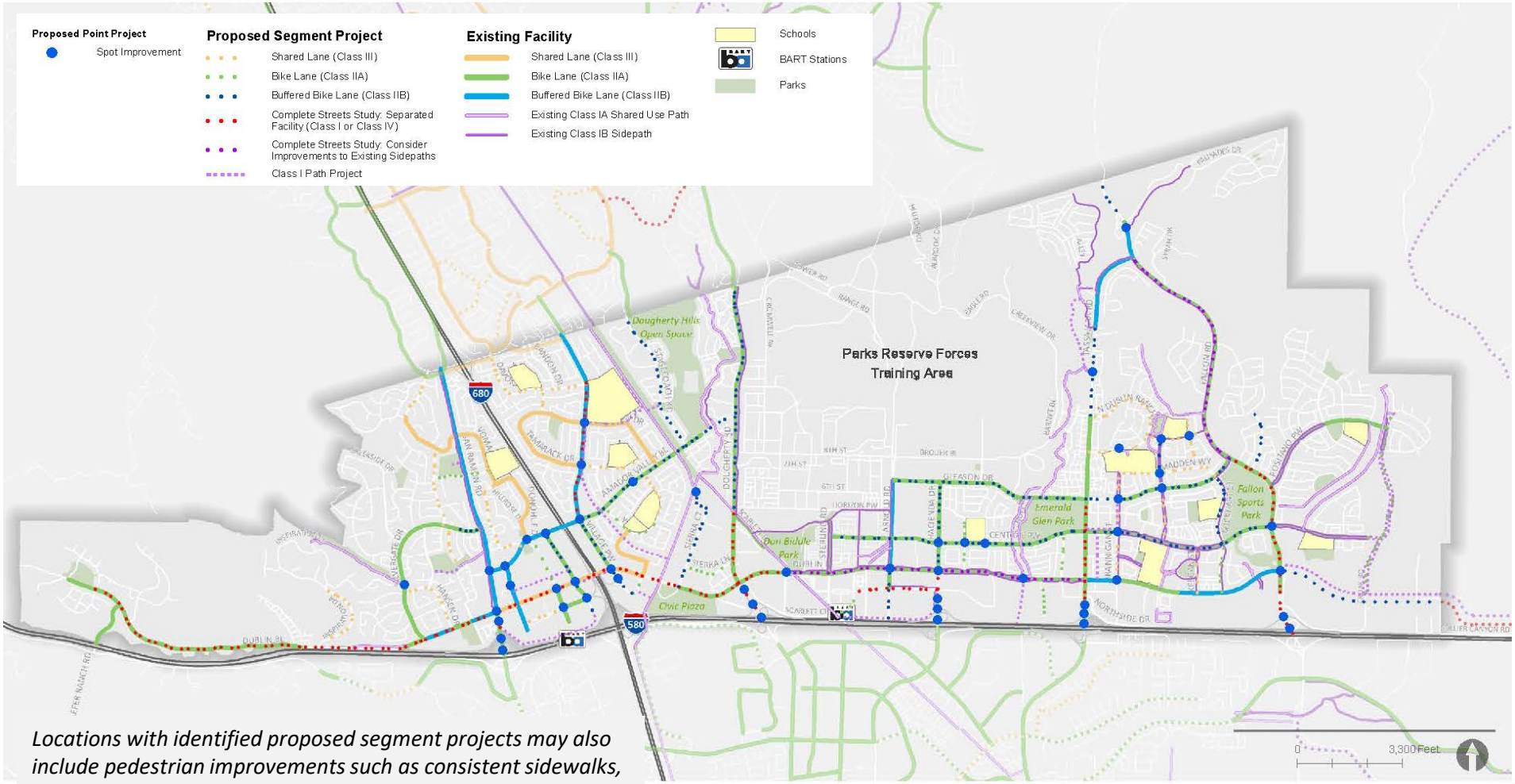
# What's New?

- All Ages & Abilities Facilities
    1. Enhance Safety
    2. Increase Walking and Biking
    3. Improve Connectivity
    4. Enhance Accessibility
    5. Prioritize Investments
- New & Updated guidance from FHWA & State
- Focus on Class I/IV, Complete Streets & sidepath improvements

# Summary of Update

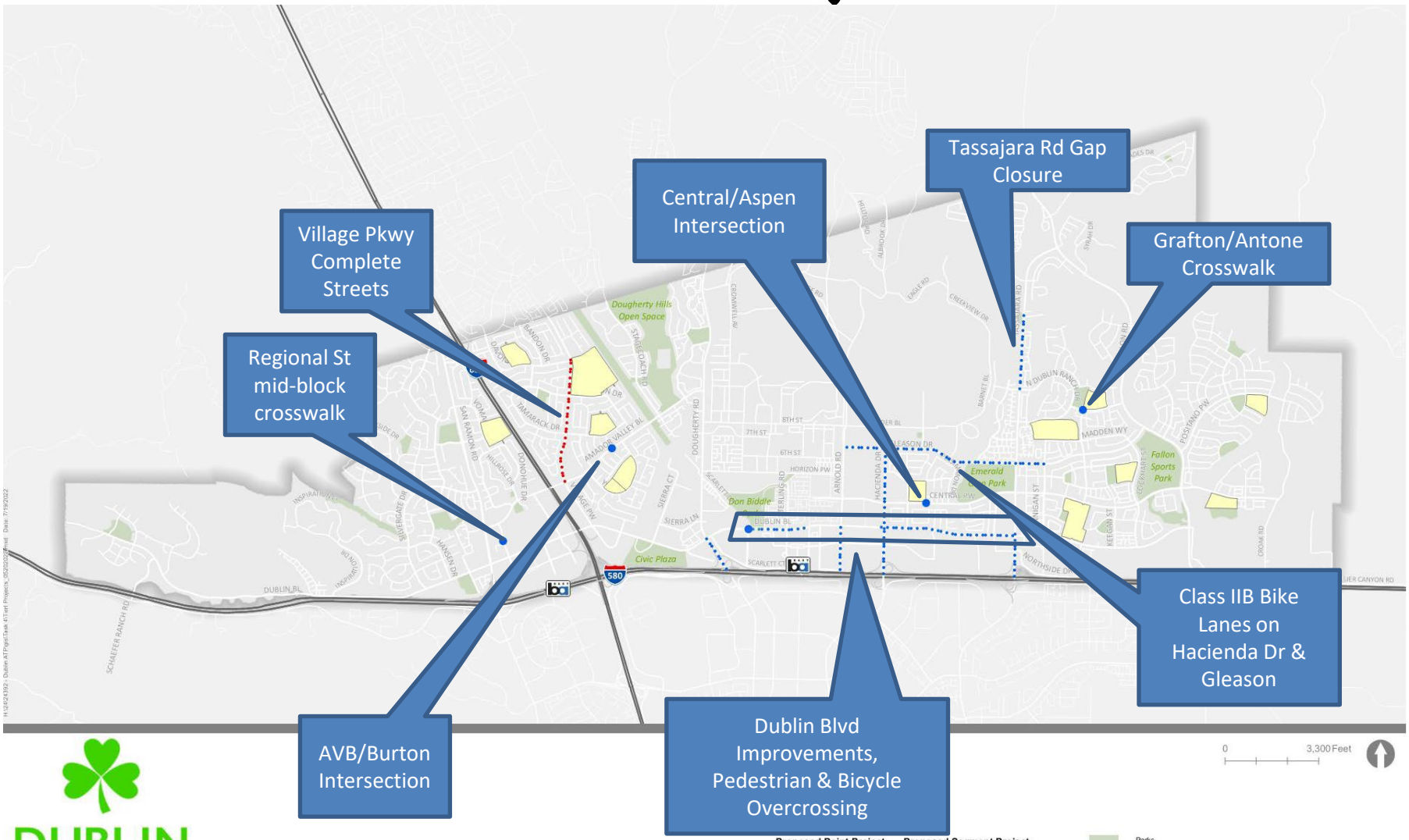
- Draft Plan Recommendations
  - Corridor Projects
  - Point Projects
  - Coordination with existing plans/projects
  - Program & Policy Recommendation
  - Implementation Plan – Tier I, II, III

# Existing and Proposed Network




*Locations with identified proposed segment projects may also include pedestrian improvements such as consistent sidewalks, buffers with street trees and/or green stormwater infrastructure, high-visibility crosswalks, accessible curb ramps, curb extensions, reduced corner radii, and signal improvements*

# Tier I Projects




DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

# Recommendation

1. Conduct the public hearing, deliberate, and adopt the **Resolution** adopting the Bicycle and Pedestrian Plan and find the Plan exempt from the California Environmental Quality Act

Agenda Item 7.1

# STAFF REPORT
## CITY COUNCIL

DATE: January 10, 2023

TO: Honorable Mayor and City Councilmembers

FROM: Linda Smith, City Manager

SUBJECT: Local Roadway Safety Plan
*Prepared by: Sai Midididdi, Associate Civil (Traffic) Engineer*

## EXECUTIVE SUMMARY:

The City Council will receive a report and consider adopting the Local Roadway Safety Plan, which provides a local-level assessment of roadway safety and identifies high-risk locations, appropriate safety improvements, and strategies to improve safety for roadways in the City of Dublin.

## STAFF RECOMMENDATION:

Adopt the **Resolution** Adopting the Local Roadway Safety Plan and Finding the Plan Exempt From the California Environmental Quality Act.

## FINANCIAL IMPACT:

All Staff costs and consultant costs associated with the preparation of the Local Roadway Safety Plan (LRSP) are funded by the Capital Improvement Program (CIP) project, Local Roadway Safety Plan, CIP No. ST0122. The CIP project budget includes $72,000 from the State of California State Transportation Improvement program to assist with the preparation of the LRSP.

Any improvement projects implementing LRSP recommendations will be funded by the CIP project, Traffic Signal and Roadway Safety Improvements, CIP No. ST0123, or by future CIP projects subject to City Council approval.

## DESCRIPTION:

Background
Federal regulations require each state to have a Strategic Highway Safety Plan (SHSP). A SHSP is a statewide data-driven traffic safety plan that coordinates the efforts of a wide range of organizations to reduce traffic accident fatalities and serious injuries on all public roads. In coordination with federal, State, local, and private sector safety stakeholders, the SHSP establishes

goals, objectives, and emphasis (or challenge) areas. The SHSP addresses the 4Es of traffic safety: Engineering, Enforcement, Education, and Emergency Services.

While the SHSP is used as a statewide approach for improving roadway safety, a Local Road Safety Plan (LRSP) provides local and rural road owners with an opportunity to address unique roadway safety needs in their jurisdictions while contributing to the success of the SHSP.

Dublin's LRSP aligns with the 2020-2024 California SHSP's guiding principles that integrate social equity and encourage the implementation of proven countermeasures and emerging technologies. The LRSP uses the Safe System approach endorsed by the United States Department of Transportation and Caltrans to identify ways Dublin and its partners can protect all roadway users. It includes engineering and non-engineering recommendations to improve traffic safety in identified emphasis areas within Dublin.

To develop Dublin's LRSP, Staff applied for and received a grant of $72,000 from the California Transportation Commission (CTC) in September 2020. On March 16, 2021, the City Council adopted a Resolution Approving a Funding Agreement with the State of California for the LRSP. Starting in 2022, the Federal Aid Highway Safety Improvement Program (HSIP) and Alameda County Transportation Commission (Alameda CTC) began requiring an LRSP for an agency to be eligible to apply for HSIP funds and for discretionary funds including Measures BB, Vehicle Registration Fee (VRF), and Transportation Fund for Clean Air (TFCA).

Summary of the Local Roadway Safety Plan (LRSP):
The LRSP uses historical collision data and an understanding of local context to assess existing roadway safety conditions in Dublin, identify areas for improvement, and provide recommended actions with an implementation plan. Ultimately, the LRSP creates a data-driven decision-making framework to reduce the number of fatal and severe injury collisions on local roadways.

The LRSP is organized into five main sections:

- Vision & Goals—Establishes a larger vision for transportation safety in Dublin and sets goals for how to get there.
- Plan Development—Details the collaborative and data-driven planning process that involved stakeholder and community engagement.
- Existing Conditions—Provides an analysis of collisions and traffic safety trends in Dublin.
- Toolbox—Lists proven engineering countermeasures and strategies that can improve roadway safety.
- Recommendations and Implementation—Prioritizes short- and long-term projects and sets a strategy for assessing progress toward established goals.

The LRSP recommends site-specific as well as systemic safety improvements that can be applied citywide. The five main sections of the LRSP are described in more detail below.

## Vision and Goals

Based on the findings from the existing conditions analysis and feedback from the Traffic Safety Committee, the vision and goals for the Plan were developed.

*Vision*

The City of Dublin will prioritize safety in all projects and will reduce the number of fatal and severe injury collisions even as the City continues to grow. The City will use data and Safe System principles recommended by the Federal Highway Administration (FHWA) and the Strategic Highway Safety Plan (SHSP) to promote safety in all actions.

*Goals*

- Implement safety countermeasures to reduce the risk of future collisions.
- Analyze data to identify and prioritize opportunities to improve roadway safety.
- Promote a culture of roadway safety in Dublin's agencies, businesses, and residents.

## Plan Development

Community and stakeholder engagement was key to the successful development of the LRSP. Stakeholders who can provide a diversity of viewpoints on the goal and emphasis area development and who will be appropriate parties for implementation action items were identified in the LRSP.

The project team led a Traffic Safety Committee meeting engaging City stakeholders in the plan development process. The Traffic Safety Committee includes staff from Dublin Police Services and the Public Works Department's Transportation and Operations Division and Maintenance Division. Based on these discussions and findings from the data analysis, safety for vulnerable road users, such as pedestrians and bicyclists, were identified as a key emphasis area for this plan. The project team utilized robust community input from the updated Bicycle and Pedestrian Plan to inform understanding of the key safety issues faced in the City of Dublin.

As a part of the LRSP development, the project team also identified a list of community stakeholders, including representatives from local and regional transportation agencies, advocacy groups, and various community-based organizations that were key in the implementation of the Plan.

## Existing Conditions

The existing conditions analysis was conducted to identify safety emphasis areas. Based on the emphasis area, the Plan identifies appropriate engineering countermeasures and non-engineering strategies to reduce collisions. This analysis covered:

- *Summary of Existing Safety-Related Plans, Policies and Programs:* The project team reviewed and summarized relevant safety-related plans, policies, and programs.
- *Review and Evaluation of Collision Data:* The project team analyzed collision data from 2016-2020 and prepared a technical memorandum summarizing findings, including a list of high collision locations and crash risk factors. This memorandum included charts and exhibits illustrating key findings related to collision factors, such as personal

attributes/human factors (e.g., driver impairment, behavior), vehicular and equipment factors (e.g., braking, occupant restraints), and roadway and environmental factors (e.g., speed limits, roadway geometric design).

- *Identification of High-Collision Locations:* A citywide analysis was conducted to identify corridors and intersections with the highest concentration of collisions. A ranked list of high-collision intersections and roadway segments was prepared based on crash frequency and severity. This helps identify high-priority locations that are also competitive for further grant application cycles.
- *Field Observations:* Based on the identified locations, the project team conducted field observations for five locations to develop potential engineering solutions.
- *Emphasis Areas:* Based on the collision analysis, high collision locations, and field observations, the project team identified five emphasis areas that deserve special focus and priority and help guide the LRSP's recommended actions and implementation strategies. Emphasis areas represent crash factors whose reduction would have the greatest overall effect on traffic safety. The emphasis areas were as follows: pedestrian collisions, nighttime safety, aging drivers (65 and older), signalized arterial/local intersections, and aggressive and impaired driving.

## Toolbox

A toolbox was included in the LRSP to group information on proven strategies and countermeasures that are effective at reducing fatal and serious injuries on roadways. These encompassed both proven engineering countermeasures and non-engineering strategies promoted by the Federal Highway Administration the California SHSP, and Caltrans Local Road Safety Plan Guidelines to improve safety for all modes of transportation and for users of all ages and abilities.

Engineering countermeasures include roadway improvements, such as pavement markings, curb and median designs, signage, and traffic control, among others. Non-engineering strategies include education, enforcement strategies, and emerging technology to improve roadway safety. Both countermeasure types work together, creating the layers of safety that are critical to a Safe System.

Each countermeasure catered to addressing at least one out of the five high-priority safety issues. The LRSP goes beyond the list of improvements and strategies and recommends innovative ideas, such as quick builds, that are short-term and low-cost so that the City can consider implementing them as pilot projects to improve roadway user safety.

## Recommendations and Implementation

### *Safety Projects*

The project team identified site-specific low-cost/short term, medium-cost/medium term and higher-cost/long term improvements for 20 priority locations based on the collision analysis and stakeholder input. In addition, the Plan identified systemic treatments that were aligned with the emphasis areas and can be applied at other locations in the City. The Plan details and provides guidance for the City to identify where and how these improvements can be implemented.

Based on the identified improvements for priority locations, the project team prepared and submitted one competitive grant application in the 2022 Highway Safety Improvement Plan (HSIP) Cycle 11 for signalized intersection improvements at 14 locations. The application included project descriptions, vicinity/location maps, project schematic layouts, cost estimates, and a collision list and diagram for the proposed locations. The grant project selection announcement is expected in early January 2023, according to Caltrans.

*Implementation Strategy*
The Plan identifies action items and performance measures for implementation and eventual evaluation. Near-term and long-term action items are listed with performance measures. The Plan also identifies a list of potential funding sources—grants such as the Caltrans Active Transportation Program, HSIP, California Office of Traffic Safety, regional funding, and federal funding sources, which strategically position the City to apply for and be competitive for the grant funding.

In addition, CIP Project No. ST0123, Traffic Signal and Roadway Safety Improvements has been included in the adopted CIP 2022-2027 (Attachment 4), which will partially provide for feasibility, design, construction, and modification of traffic signals and roadway safety improvements at locations prioritized and recommended by the LRSP.

## ENVIRONMENTAL DETERMINATION:

The Local Roadway Safety Plan (LRSP) is statutorily exempt from the California Environmental Quality Act (CEQA) requirements pursuant to CEQA Guidelines Section 15262- Feasibility and Planning Studies, a project involving only feasibility or planning studies for possible future actions which the agency, board, or commission has not approved, adopted, or funded does not require the preparation of an EIR or Negative Declaration. The LRSP includes strategies and location data that may be used to develop future projects; however, any future action would require approval, funding, and independent evaluation under CEQA. In addition, the LRSP is statutorily exempt pursuant to CEQA Guidelines Section 15301 - Existing Facilities, CEQA Guidelines Section 15304 - Minor Alterations to Land, and CEQA Guidelines Section 15306 - Information Collection. Finally, under CEQA Guidelines Section 15061(b)(3), the commonsense exemption, in that it can be seen with certainty that there is no possibility that adoption of the LRSP would result in physical alteration of the environment, and the action has no potential to have a significant effect on the environment.

## STRATEGIC PLAN INITIATIVE:

Strategy 3: Infrastructure Maintenance and Reinvestment
Objective b: Provide on-going condition assessments of aging City facilities and assets

Strategy 5: Safe and Accessible Community
Objective b: Continue to engage with the community using all appropriate methods to share and exchange information.

## NOTICING REQUIREMENTS/PUBLIC OUTREACH:

A copy of this Staff Report was sent to Alameda County Transportation Commission's Independent Watchdog Committee. The City Council Agenda was posted.

## ATTACHMENTS:

1) Resolution Adopting the Local Roadway Safety Plan and Finding the Plan Exempt From the California Environmental Quality Act
2) Exhibit A to the Resolution - Draft Local Roadway Safety Plan
3) Appendices to the Local Roadway Safety Plan
4) CIP Project No. ST0122 Local Roadway Safety Plan
5) CIP Project No. ST0123 Traffic Signal and Roadway Safety Improvements

**RESOLUTION NO. 23-xx**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF DUBLIN**

**ADOPTING THE LOCAL ROADWAY SAFETY PLAN AND FINDING THE PLAN EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT**

**WHEREAS**, a Local Roadway Safety Plan (LRSP) is a critical planning, policy, and implementation document that supports the City's efforts to improve the safety of its transportation infrastructure for all modes and for people of all ages and abilities; and

**WHEREAS**, to pursue safety grant funds through the federal Highway Safety Improvement Program administered by Caltrans and discretionary funds including Measure BB, Vehicle Registration Fee, and Transportation Fund for Clean Air administered by the Alameda County Transportation Commission, a local agency must have an LRSP or equivalent planning document; and

**WHEREAS**, the LRSP is aligned with the 2020-2024 California Strategic Highway Safety Plan's guiding principles and uses the Safe System approach endorsed by the United States Department of Transportation and Caltrans' commitment to achieve its vision of no fatalities and severe injuries on California roadways by 2050; and

**WHEREAS**, this LRSP uses historical collision data and an understanding of local context to assess existing roadway safety conditions in Dublin, identify areas for improvement, and provide recommended actions, site-specific as well as systemic safety improvements with an implementation plan; and

**WHEREAS**, in accordance with the California Environmental Quality Act (CEQA) certain projects require review for environmental impacts and, when applicable, environmental documents to be prepared; and

**WHEREAS**, pursuant to the requirements of CEQA, the LRSP was examined to determine if environmental review is required. The analysis concluded that the LRSP is exempt from CEQA review as follows:

- The LRSP qualifies for the statutory exemption pursuant to CEQA Guidelines Section 15262- Feasibility and Planning Studies, a project involving only feasibility or planning studies for possible future actions which the agency, board, or commission has not approved, adopted, or funded does not require the preparation of an EIR or Negative Declaration. The LRSP includes strategies and location data that may be used to develop future projects; however, any future action would require approval, funding, and independent evaluation under CEQA. In addition, the LRSP is statutorily exempt pursuant to CEQA Guidelines Section 15301 - Existing Facilities, CEQA Guidelines Section 15304 - Minor Alterations to Land, and CEQA Guidelines Section 15306 - Information Collection. Finally, under CEQA Guidelines Section 15061(b)(3), the commonsense exemption, in that it can be seen with

certainty that there is no possibility that adoption of the LRSP would result in physical alteration of the environment, and the action has no potential to have a significant effect on the environment; and

**WHEREAS**, the City Council did consider the LRSP and CEQA exemptions, as presented by Staff; and

**WHEREAS**, the location and custodian of the documents or other material which constitute the record of proceedings for the project is the City of Dublin Public Works Department, 100 Civic Plaza, Dublin, CA 94568.

**NOW, THEREFORE, BE IT RESOLVED** that the foregoing recitals are true and correct and made a part of this Resolution.

**BE IT FURTHER RESOLVED** that on the basis of the findings above and the record as a whole, the City Council of the City of Dublin does hereby find that the project is exempt from CEQA and directs Staff to file the Notice of Exemption with the Office of Planning and Research, Alameda County Clerk.

**BE IT FURTHER RESOLVED** that the City Council of the City of Dublin does hereby adopt the Local Roadway Safety Plan, attached hereto as **Exhibit A**.

**PASSED, APPROVED, AND ADOPTED** this 10th day of January 2023, by the following vote:

**AYES:**

**NOES:**

**ABSENT:**

**ABSTAIN:**

_____
Mayor

**ATTEST:**

_____
City Clerk

Attachment 2

# DUBLIN DRAFT LOCAL ROADWAY SAFETY PLAN



JANUARY 2023

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# GLOSSARY

**Aggressive driving** includes behaviors such as speeding, tailgating, running traffic signals or signs, and other reckless maneuvers.

**Challenge areas** represent types of roadway users, locations, or collisions identified by the California Department of Transportation's *Strategic Highway Safety Plan* (SHSP). These areas, when addressed, have the most potential to improve roadway safety.

**Countermeasures** are engineering infrastructure improvements that can be implemented to reduce the risk of collisions.

**Emphasis areas** represent types of roadway users, locations, or collisions with safety issues that deserve special focus in Dublin based on local trends.

**Impaired driving** describes operating a motor vehicle while under the influence of a substance, including alcohol, marijuana, illicit drugs, or some prescription medications.

**Local roadway safety plans**, or LRSPs, are documents that provide local-level assessments of roadway safety and identify locations and strategies to improve safety on local roadways.

**Local roadways** are all roadways not part of the State Highway System. Local roadways can be owned by cities or counties. In this plan, local roadways are Dublin owned.

**Primary collision factors** (PCFs) convey the violation or underlying causal factor for a collision. Although there are often multiple causal factors, a reporting officer at the scene of a collision indicates a single relevant PCF related to a California Vehicle Code violation.

**Proven Safety Countermeasures** are a series of 28 countermeasures and strategies promoted by the Federal Highway Administration (FHWA). These countermeasures can help address safety issues related to speed management, intersections, roadway departures, and pedestrians and bicyclists. For more, visit https://highways.dot.gov/safety/proven-safety-countermeasures.

**The Safe System approach** is a layered method for roadway safety promoted by the FHWA. This approach uses redundancies to anticipate mistakes and minimize injury. For more, visit https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf.

**Safety partners** are agencies, government bodies, businesses, and community groups that Dublin can work with to plan, promote, and implement safety projects.

**Strategies** are non-engineering tools that can help address roadway user behavior, improve emergency services, and build a culture of safety.

**Vulnerable roadway users** are those at greater risk of death or serious injury from crashes because they lack the physical protection afforded by a motor vehicle. Bicyclists and pedestrians are vulnerable roadway users.




# INTRODUCTION

# INTRODUCTION

## A Commitment to Safety

This Local Roadway Safety Plan, or LRSP, outlines a plan to ensure Dublin residents, visitors, and those who travel through the community get home safely. Dublin is among the fastest growing communities in the country. From 2010 to 2021, Dublin's population grew by 37 percent.[1] With increasing numbers of residents and visitors driving, walking, and biking along Dublin's roadways, it has never been more important to address transportation safety issues in the community.

## Why Local Roadways Matter

Local roadways are all roadways not part of the State Highway System. Nationwide, local roadways are less traveled than State highways but have a higher rate of fatal and severe injury collisions.[2] Efforts to improve local roadway safety—such as this LRSP—play a crucial role in identifying where and why fatal and severe injury collisions happen and actions that can help eliminate them.

Because no two communities are exactly alike, this LRSP identifies and prioritizes safety improvements specifically for safety issues on Dublin roadways. This LRSP is a living document designed to be flexible and to respond to evolving community needs. It's recommended that this LRSP be revisited and updated every five years, consistent with best practices.

## Improving Safety in Dublin and Beyond

Improving local roadway safety in Dublin is just one part of larger nationwide and statewide efforts to reduce fatal and severe injury collisions.

### ALIGNING WITH THE CALIFORNIA'S STRATEGIC HIGHWAY SAFETY PLAN (SHSP)

The 2020–2024 California Strategic Highway Safety Plan (SHSP) sets out California's vision, goals, and objectives for reducing fatal and severe injury collisions on public roadways (local roadways and state highways). To draw this roadmap, the California Department of Transportation (Caltrans) led efforts to analyze collision data and collaborate with traffic safety partners across the state. As a result, the SHSP identified California's 16 challenge areas, or areas with the most potential to improve roadway safety. Of the challenge areas, six were identified as high-priority areas, or areas with the greatest opportunity to reduce death and severe injury.

Historically, the SHSP has used the five Es (education, enforcement, engineering, emergency response, and emerging technologies) to organize strategies. In 2021, state transportation officials shifted focus and adopted guiding principles that integrate social equity, create a Safe System

[1] Pop-Facts Demographic Snapshot Summary, "Dublin, CA (city)" (2021), https://dublin.ca.gov/238/Community-and-Economic-Profile.

[2] Anderson et al. Noteworthy Practices: Addressing Safety on Locally-Owned and Maintained Roads A Domestic Scan, FHWA-SA-09-019, (2010).

approach, and encourage implementation of proven countermeasures and emerging technologies.

Local jurisdictions within the State have begun to implement strategies to eliminate traffic deaths and severe injuries using the SHSP's guiding principles and challenge areas.

## CREATING A SAFE SYSTEM

The United States Department of Transportation adopted the Safe System approach as its core strategy in January 2022.[3] The following month, Caltrans released Director's Policy 36, which commits the state to the Safe System approach to achieve its vision of no fatalities and severe injuries on California's roadways by 2050 and safer outcomes for all communities.[4] These efforts build from the Federal Highway Administration's promotion of the Safe System approach as a strategy to eliminate all traffic deaths.

The Safe System approach aims to eliminate fatal and serious injuries for all roadway users. It works toward eliminating roadway deaths based on six key principles:

- Deaths and severe injuries are unacceptable.
- Humans make mistakes.
- Humans are vulnerable.
- Responsibility is shared.
- Safety is proactive.
- Redundancy is critical.

### SHSP Challenge Areas

(High-priority areas for Dublin in bold)

- **Active Transportation: Pedestrians and Bicyclists**
- **Impaired Driving**
- **Intersections**
- **Lane Departures**
- **Speed Management/Aggressive Driving**
- Aging Drivers
- Commercial Vehicles
- Distracted Driving
- Driver Licensing
- Emergency Response
- Emerging Technologies
- Motorcyclists
- Occupant Protection
- Work Zones
- Young Drivers

[3] National Roadway Safety Strategy, United States Department of Transportation, January 2022 https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf

[4] California Department of Transportation Director's Policy 36, February 15, 2022 https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/policy/dp_36-a11y.pdf

There are five elements (or layers) to a Safe System (see Figure 1):

- **Safe Roadway Users**—All roadway users, including bicyclists, pedestrians, and transit-riders, should be able to travel safely.
- **Safe Vehicles**—Vehicles should be designed and regulated to reduce the frequency and severity of collisions.
- **Safe Speeds**—The faster a vehicle is travelling, the greater its risk to human life. Safe speeds are speeds that reduce impact forces, improve stopping time, and improve visibility.
- **Safe Roadways**—Roadway design can accommodate human mistakes and improve injury tolerances through strategies, such as physically separating those travelling different speeds or using signage to alert drivers to hazards.
- **Post-Collision Care**—If a collision does occur, first responders must assess, stabilize, and transport those who were injured. Forensic investigation or incident management teams are also important parts of post-collision care.

This LRSP uses a Safe System approach to identify ways that Dublin and its safety partners can create layers to help protect all roadway users—even when they make mistakes.

To build redundancy in the local transportation system, Dublin and its teaming partners can

- Establish a vision, goals, and partnerships to help implement the plan.
- Identify systemic engineering countermeasures and use them proactively rather than reactively.
- Provide educational materials to communicate key roadway safety information to residents, business owners, and visitors.
- Review policies, guidelines, and standards to prioritize safety.

**Figure 1. Safe System Elements**




- Overlap roadway stakeholder efforts to create a culture of traffic safety.
- Identify potential funding and coordination sources for project implementation.

(For more on Dublin's safety partners, see page 14.)

This plan and its recommendations can help create a Safe System in Dublin. However, State and federal policy—like legislation to allow automated speed enforcement and continued regulation of vehicle safety standards—will be essential to complete the Safe System categories that local agencies cannot directly affect.

# What is an LRSP?

An LRSP provides a local-level assessment of roadway safety and identifies locations, countermeasures, and strategies to improve safety on local roadways. An LRSP is a multi-disciplinary approach to traffic safety that creates partnership opportunities with safety partners (including other agencies) who can help implement recommendations.

LRSPs are one of FHWA's Proven Safety Countermeasures, and these plans provide crosscutting efforts to prioritize investments. To assist with implementation of engineering strategies, FHWA provides more than $2 billion each year in Highway Safety Improvement Program (HSIP) funds for States to address roadway safety challenges on all public roadways. To pursue HSIP grant funds in California (estimated at $210 million for Cycle 11 in 2022), a local agency must have an LRSP or equivalent planning document. Dublin's access to these funds will help make its roadways safer for all users. For more on the FHWA's safety strategy, visit https://www.transportation.gov/NRSS.

# Plan Overview

This LRSP uses historical collision data and an understanding of local context to assess existing roadway safety conditions in Dublin, identify areas for improvement, and provide recommended actions and an implementation plan. Ultimately, this LRSP creates a data-driven decision-making framework to reduce the number of fatal and severe injury collisions on local roadways.

The plan is organized into five main sections:

**Vision & Goals**—Establishes a larger vision for transportation safety in Dublin and sets goals for how to get there.

**Plan Development**—Details the collaborative and data-driven planning process.

**Existing Conditions**—Provides an analysis of collisions in Dublin.

**Toolbox**—Lists proven countermeasures and strategies that can improve roadway safety.

**Recommendations and Implementation**—Prioritizes short- and long-term projects and sets a strategy for assessing progress toward established goals.

# Dublin's Safety Emphasis Areas

Like the State's SHSP challenge areas, **emphasis areas** guided this LRSP's development as well as its recommended actions and implementation strategies. From 2016 through 2020, there were 13 reported fatal and severe injury collisions in Dublin. The city has five emphasis areas that deserve special focus based on local trends:

**Pedestrian Collisions**
In Dublin, pedestrian collisions account for 28 percent of all fatal and severe injury collisions.

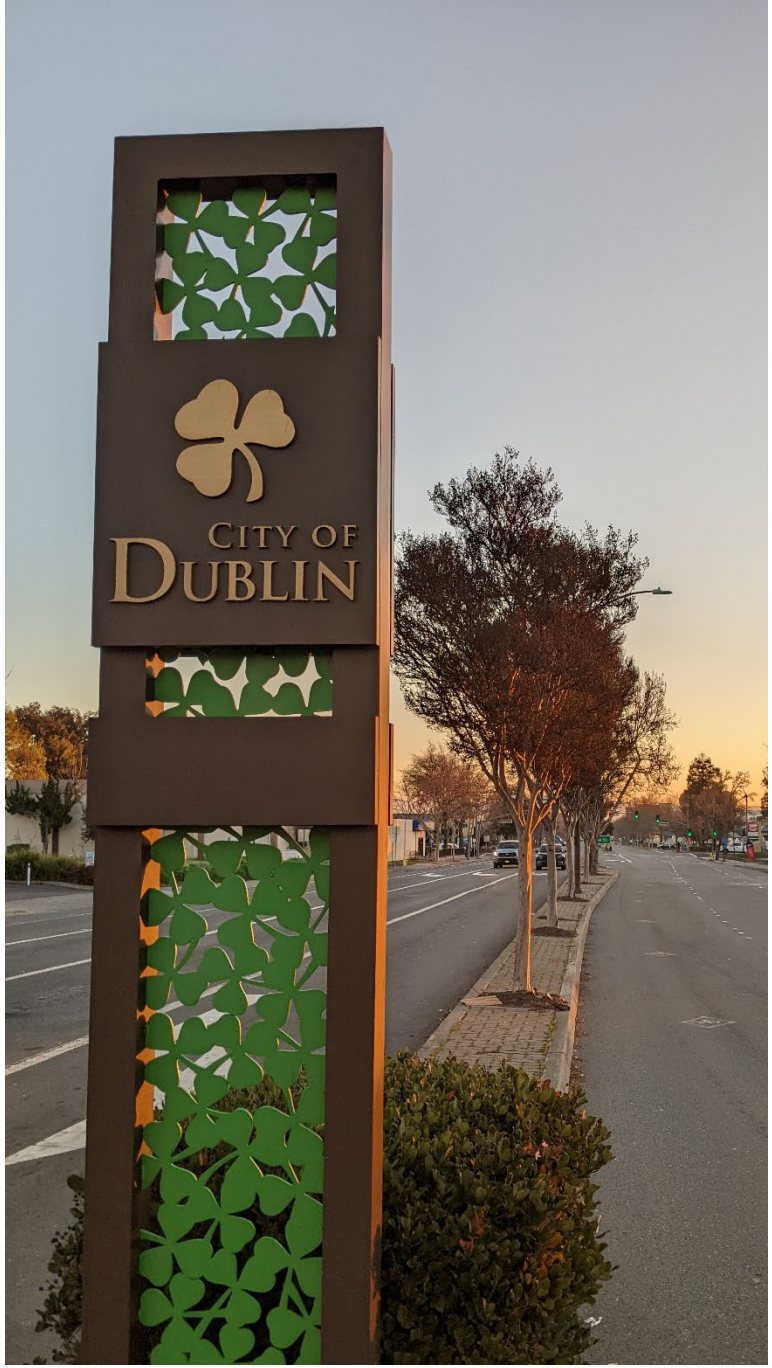
**Nighttime Safety**
Sixty percent of Dublin's fatal and severe injury pedestrian collisions occur in dusk, dawn, or dark conditions.

**Aging Drivers**
Collisions involving drivers 65 and older account for 22 percent of all fatal and severe injury collisions.

**Signalized Arterial/Local Intersections**
Nearly 45 percent of Dublin's fatal and severe injury collisions occur at intersections. These locations also see many rear end and broadside collisions. In Dublin, hit object collisions—the most frequent type of fatal and severe injury collision—primarily occur at signalized intersections.

**Aggressive and Impaired Driving**
Aggressive driving accounts for over 15 percent of fatal and severe injury collisions in Dublin and includes several behaviors, such as speeding, tailgating, running traffic signals or signs, and making other reckless maneuvers.

Impaired driving accounts for over 25 percent of fatal and severe injury collisions in Dublin and includes collisions in which the driver was using alcohol and/or illicit, prescribed, or over-the-counter drugs.






# VISION & GOALS

# VISION AND GOALS

## Plan Vision

The City of Dublin will prioritize safety in all projects and will reduce the number of fatal and severe injury collisions even as the city continues to grow. The City will use data and Safe System principles recommended by FHWA and SHSP to promote safety in all actions.

## Plan Goals

The following goals will guide collaborative planning efforts with the Traffic Safety Committee and other partners:

1 **Implement safety countermeasures to reduce the risk of future collisions.**

- Reduce the number of fatal and severe injury collisions in identified emphasis areas.[5]
- Reduce the number of fatal and severe injury collisions on all City roadways.
- Implement systemic engineering countermeasures at identified priority locations and other applicable locations along City roadways.

2 **Analyze data to identify and prioritize opportunities to improve roadway safety.**

- Monitor the number of fatal and severe injury collisions and review and summarize the number of fatal and severe injury collisions to see if total numbers are decreasing, increasing, or remaining constant.
- Maintain or increase annual safety expenditures to proactively implement proven countermeasures to target emphasis areas.
- Track and apply for safety-related grants to implement safety countermeasures in line with emphasis areas.
- Review FHWA's *Proven Safety Countermeasures*, updated Caltrans *Local Roadway Safety Manual,* and other resources to consider new countermeasures that can address emphasis areas.[6]
- Revisit and update this plan, including identified emphasis areas and priority locations, at least every five years.

3 **Promote a culture of roadway safety in Dublin's agencies, businesses, and residents.**

- Continue to collaborate with the Traffic Safety Committee and other partners to continue efforts to eliminate fatalities and severe injury collisions on public roadways within the city. (For more on Dublin's safety partners, see page 14.)

[5] Dublin is expected to continue its growth in the future. With a greater population and total vehicle miles traveled, the total exposure risk will increase. The City can monitor total and fatal and severe injury collisions and a number normalized by annual population to understand if fatal and severe injury collisions are increasing, decreasing, or staying constant. An absolute reduction in fatal and severe injury collisions is still desired.

[6] The *Local Roadway Safety Manual* is a technical resource published by Caltrans and updated with each HSIP funding cycle (approximately every two years). It includes research-backed information and funding eligibility for safety countermeasures. It is available online at https://dot.ca.gov/programs/safety-programs/shsp/resources.

- Continue to share resources on a regular basis with Dublin Police Services and the Office of Communications to maintain relevant information for non-engineering strategy implementation.
- Continue to coordinate safety improvements and non-engineering safety strategies across jurisdictions and through Alameda CTC, Tri-Valley Transportation Council, and other relevant committees.

## Countermeasures & Strategies

To build a Safe System in Dublin, this LRSP provides **both engineering countermeasures** and **non-engineering strategies** promoted by the FHWA, the California SHSP, and Caltrans LRSP guidelines.

**Engineering countermeasures** include pavement markings, curb and median designs, signage, and traffic control, among others.

**Non-engineering strategies** use tools including education, equitable enforcement strategies, and emerging technology to improve roadway safety. Both countermeasure types work together, creating the layers of safety that are critical to a Safe System.



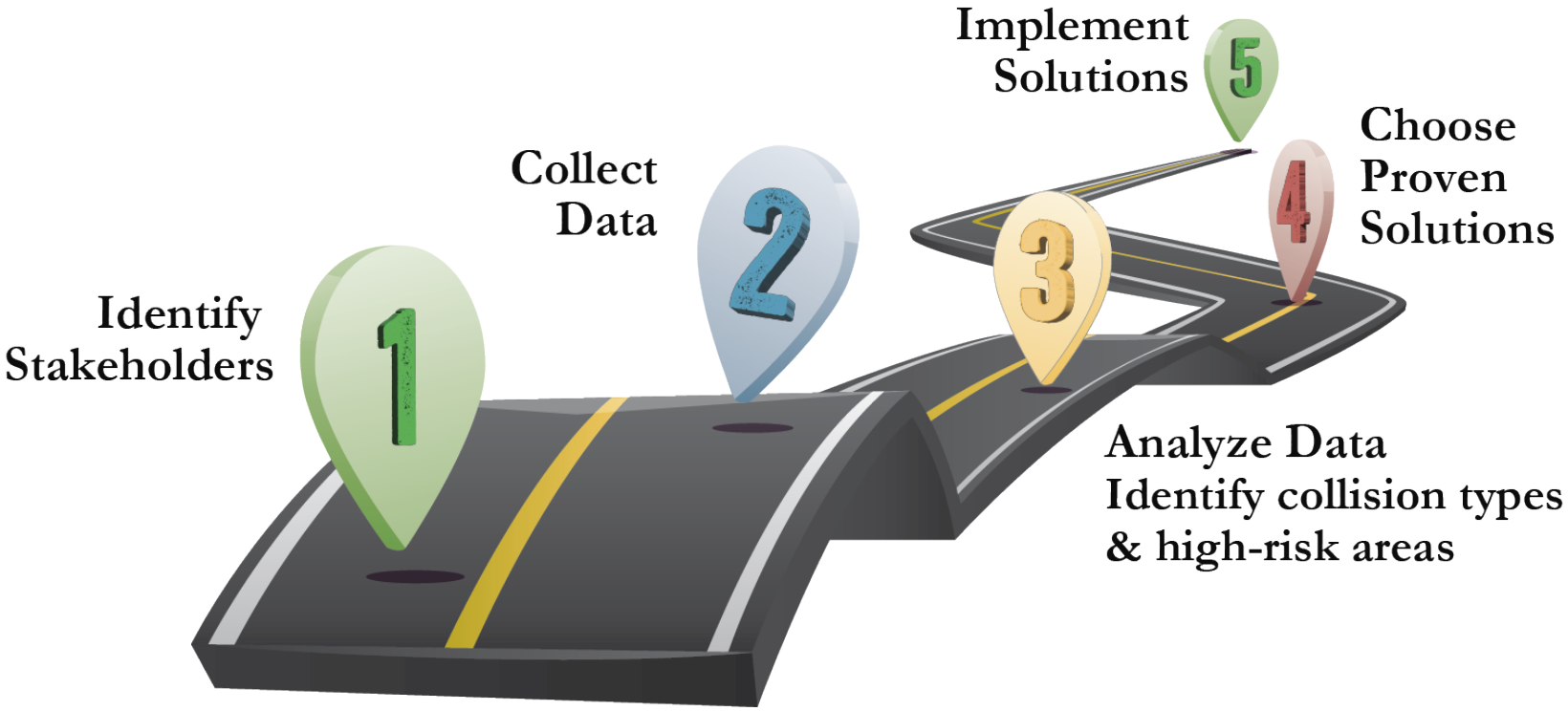



# PLAN DEVELOPMENT

# PLAN DEVELOPMENT

This plan was developed in collaboration with City staff and using collision data and best practices resources.

## LRSP Roadmap




*Source: FHWA, "Local Road Safety Plans," (January 2021), https://safety.fhwa.dot.gov/LRSPDIY/#*

# Working Together

Continuing longstanding partnerships with community organizations and building new ones will promote interagency collaboration and create a culture of roadway safety.

These agencies have been, or can be, valued partners:

**Police Services**
Dublin Police Services forms enforcement location priorities based on its review of collision history. Continuing to leverage City relationships with Dublin Police Services through the Traffic Safety Committee will help keep police services abreast of emphasis areas and high-risk locations for roadway users. Dublin Police Services could also help administer recommended programs like speed trailers.

**Dublin Schools**
Dublin schools can be partners in administering educational programs for students, staff, and families that encourage safe transportation behaviors. The Dublin Unified School District, Quarry Lane School, and other private schools, preschools, and after-school programs can also be valuable partners.

**Transit Agencies**
Transportation agencies and providers such as BART, Livermore-Amador Valley Transit Authority (LAVTA/Tri-Valley Wheels, and Contra Costa County Connection) can provide promotion for education campaigns and help identify engineering solutions at locations of shared interest or jurisdiction.

## Recommended Safety Partners

**City Manager's Office and Department of Public Information**

**City Council**

**Dublin Police Services**

**Alameda County Fire Department**

**Alameda County Department of Public Health**

**Dublin Unified School District**

**Bay Area Rapid Transit District (BART)**

**Livermore-Amador Valley Transit Authority**

**County Connection**

**Bike East Bay**

**Center for Independent Living (CRIL) Hayward**

**Other Community-based Organizations**

**Chamber of Commerce**

**Community Groups & Local Organizations**
Community groups can provide feedback on safety issues and help encourage communication with the public about safety campaigns and future projects. Health advocacy or active transportation groups like Bike East Bay can help coordinate education classes through schools or at City-sponsored events. (For a full list of stakeholders identified collaboratively with the Dublin Bicycle and Pedestrian Plan Update (2022), see Appendix A.)

**City Offices**
This LRSP was primarily developed by the Public Works Department, and other departments will be essential to the plan's implementation. The City Manager's Office and the Office of Communications receive information and help disseminate information to the community. Critical pieces of information that come through this office include community events, news, fact sheets, and FAQs. Collaboration with this department is essential to effectively relay information on safety education, project news, community engagement, and other roadway safety initiatives. The Community Development Department plays an important role in elevating safety through community planning and development review and efforts. The Economic Development Office maintains strong relationships with local businesses and can facilitate conversations and information about safety goals, initiatives, and upcoming projects.

**Alameda County Fire Department**
The Alameda County Fire Department (ACFD) already provides guidance on safety improvement projects during the design review process. This invaluable partnership helps improve emergency response services and assessments of proposed safety countermeasures.



# Dublin's Existing Safety Efforts

This LRSP builds on existing plans, policies, and programs that support safe, accessible, equitable, and multimodal transportation. The most relevant documents pertaining to local roadway safety are included below, along with an explanation of how their goals, policies, programs, and recommendations informed this LRSP.

## Dublin Traffic Safety Reports and Studies (2018)

Every three years, traffic safety performance reports have identified intersections and street segments with collision rates higher than the statewide average for similar locations and offer potential safety improvements. The most recent study was completed in 2018.

The intersections and segments identified in these reports helped the LRSP project team identify and vet key locations and safety improvements. This LRSP will replace these studies moving forward.

## Complete Streets Policy (City Council Resolution 199-12) (2012)

Complete streets are designed to make space for all roadway users, including pedestrians, bicyclists, transit users, and motor vehicle drivers. The Complete Streets Policy identifies complete streets planning as an integral part of providing mobility needs for all users and furthering the health, safety, welfare, economic vitality, and environmental wellbeing of the community.

This LRSP includes multimodal safety recommendations intended to provide complete streets.

## Bicycle and Pedestrian Plan (2022)

The updated 2014 Bicycle and Pedestrian Master Plan will include recommendations to guide Dublin's approach to bicycle and pedestrian safety. The update inventories existing conditions; analyzes existing barriers to walking and biking; provides program, policy, and infrastructure recommendations; and presents a prioritization framework to identify a tiered list of projects for implementation. The updated plan prioritizes safety in facility design and policy implementation. The updated plan also identifies local biking and walking high-injury networks, or HINs based on six years of collision data from 2014 to 2019. (To view the HINs in more detail, see Appendix E.)

The LRSP aligns its high-collision locations and countermeasures with the updated Bicycle and Pedestrian Plan's priorities and recommendations. This LRSP also incorporates community feedback collected as part of the updated plan's public outreach efforts.

## Alameda County Countywide Active Transportation Plan (2019)

The Alameda County Transportation Commission (Alameda CTC) Countywide Active Transportation Plan (CATP) aims to improve pedestrian and bicyclist safety by prioritizing projects, policies, and programs that will address the greatest safety needs and by optimizing investments through corridor-level analyses and performance evaluations.

This CATP created profiles for each community in the county and includes local pedestrian and bicycle HINs based on collision data from 2012 to 2016. In total, eight miles of City roadways are part of a pedestrian or bicycle HIN.

This LRSP identifies projects along local HINs that would be prioritized for capital investment opportunities through the Alameda CTC.

## Downtown Dublin Streetscape Plan (2020)

The recently updated Downtown Dublin Streetscape Plan aims to develop pedestrian-oriented environments on commercial throughways, downtown local streets, crosstown boulevards, and parkways.

LRSP goals and project recommendations align with this plan's emphasis on safe and comfortable facilities for people walking and biking.

## Eastern Dublin Specific Plan (Updated 2022)

This plan establishes a planning framework for the future growth and development of approximately 3,300 acres of the largely unincorporated area east of Camp Parks. To reduce reliance on single-occupant vehicles, the plan features a comprehensive multimodal transportation and circulation system that will accommodate regional and local automobile traffic and encourage people to choose alternative modes of transportation, like walking, cycling, bus, ridesharing, light rail, or BART.

This LRSP coordinates its project recommendations with those identified in the Eastern Dublin Specific Plan. The LRSP also aligns its goals with the larger multimodal goals of the Eastern Dublin Specific Plan.

## Downtown Dublin Specific Plan (2020)

The Downtown Dublin Specific Plan combines and replaces five existing specific plans: Downtown Core, Dublin Downtown, Village Parkway, West Dublin BART, and a portion of San Ramon Road. The plan sets a vision for a pedestrian-friendly downtown.

This LRSP aligns its downtown project recommendations with the Downtown Dublin Specific Plan's guiding principles. Both systemic and location-specific recommendations in this LRSP align with Dublin's vision of pedestrian-friendly streets and a roadway system traversable by foot or bike.

## Dublin Village Historic Area Specific Plan (2014)

This plan ensures that future development in Dublin's historic core will remain sensitive to the area's historic past. The plan also formalizes the City's commitment to preserving and enhancing remaining historic, cultural, and archeological resources.

Safety project recommendations in this LRSP account for the identified safety, pedestrian-experience, and placemaking goals set out in the Dublin Village Historic Area Specific Plan.

## Dublin Crossing Specific Plan (2013)

The Dublin Crossing Specific Plan outlines the development of 189 acres in the center of Dublin, north of Interstate 580 and Dublin Boulevard, on a portion of the former Camp Parks Reserve Forces Training Area. The project includes residential units, commercial uses, parks, open space, and a school. To create a well-connected and environmentally-conscious community for all users, the plan examines land use, development standards, design guidelines, and streetscape design.

Safety project recommendations in this LRSP incorporate streetscape and design guidelines identified in the Dublin Crossing Specific Plan area whenever possible.

## Safe Routes to School

Alameda CTC manages the Alameda County Safe Routes to School (SR2S) Program. Through direct assistance and partnerships with local jurisdictions and school districts, SR2S promotes active transportation choices for parents and students traveling to school. School staff, parent volunteers, Dublin Police Services, and Dublin's Public Works staff continue to work together to create school safety assessments, which report street conditions and utilization around schools and make infrastructure and programmatic recommendations. Alameda CTC maintains a SR2S webpage with resources and school safety assessments at participating schools.

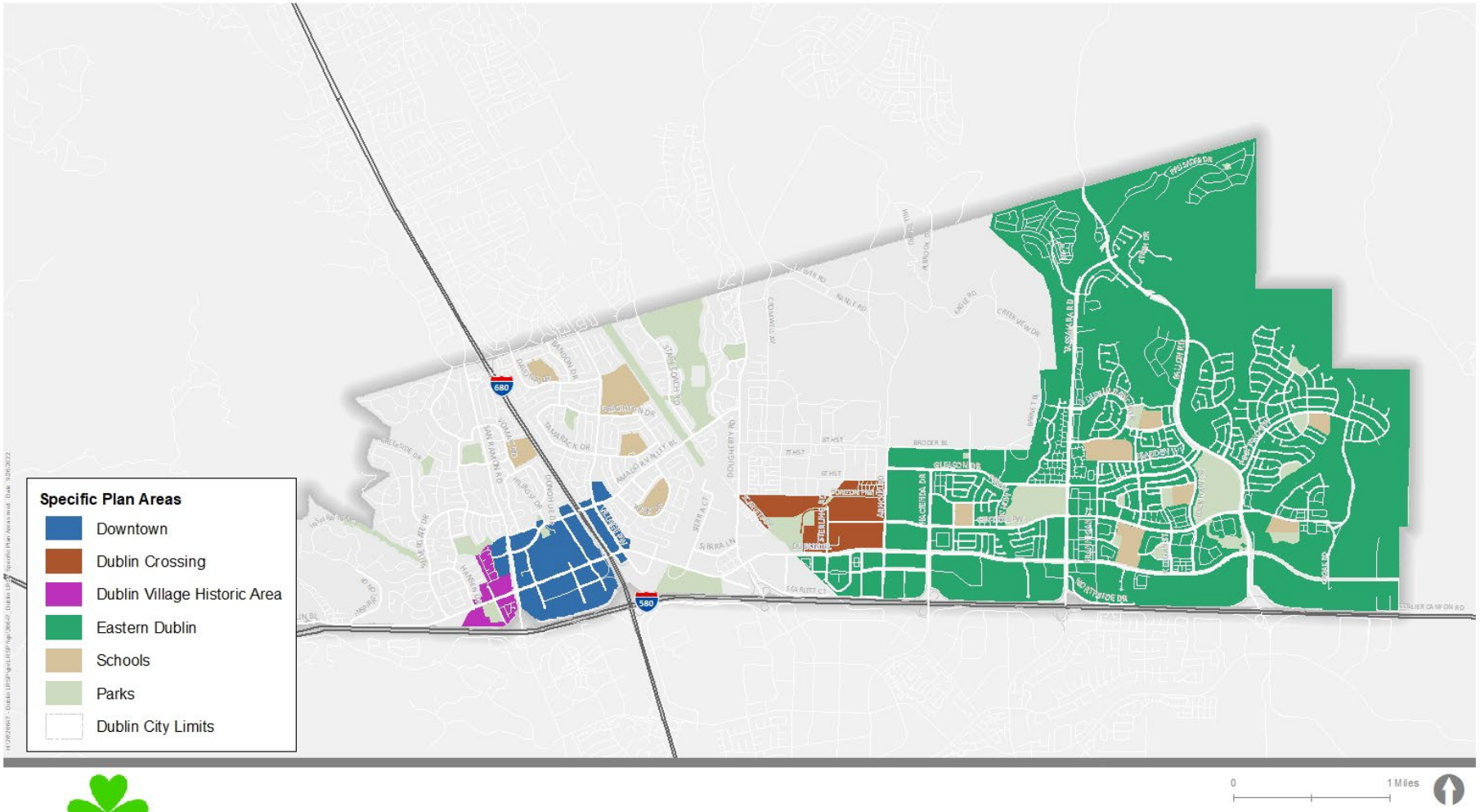
The LRSP project team used SR2S recommendations to develop engineering countermeasures for systemic solutions throughout Dublin and site-specific solutions near schools.

For more on the SR2S webpage and school safety assessments, visit https://alamedacountysr2s.org/our-program/school-safety-assessments/#dublin.

For Dublin SR2S maps, visit https://dublin.ca.gov/349/Safe-Routes-to-School.



Figure 2: Dublin Specific Plan Areas



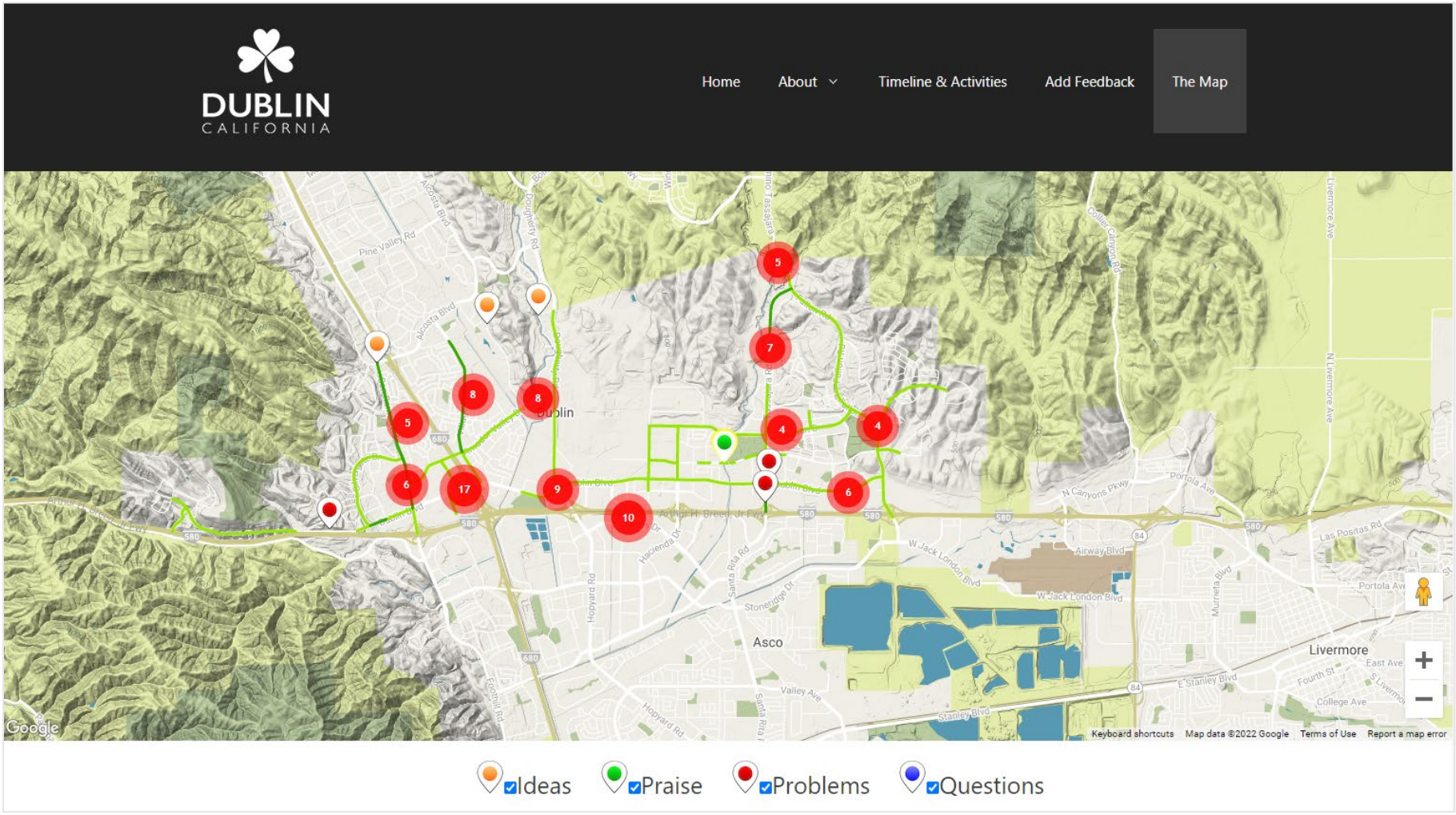
# Engagement and Outreach

This LRSP was developed concurrently with the ongoing 2022 Bicycle and Pedestrian Plan update, which organized a series of public engagement events. Because safety is central to both plans' recommendations, those public activities and feedback inform locations, priorities, and input for this LRSP. The 2022 Bicycle and Pedestrian Plan project team conducted an extensive public survey, hosted two public workshops, and conducted a series of pop-up events at the Dublin Farmers' Market, the Alamo Creek trail head, and at a local St. Patrick's Day event. At these pop-ups, City staff and project team members received input on what infrastructure would best meet the needs of Dublin's residents, business owners, workers, and other visitors who walk and bike. Survey respondents indicated that safety and vehicle speeds were primary concerns when walking or biking. By incorporating the Bicycle and Pedestrian Plan's high-injury network findings and listening directly to community needs, this LRSP reflects community-driven desires to improve safety and encourage more multimodal transportation choices on Dublin's local roadway system.

**Figure 3. Pop-up Community Engagement at a St. Patrick's Day Event**



Figure 4. Webmap for the 2022 Bicycle and Pedestrian Plan






# EXISTING CONDITIONS

# EXISTING CONDITIONS

## Dublin Safety Today

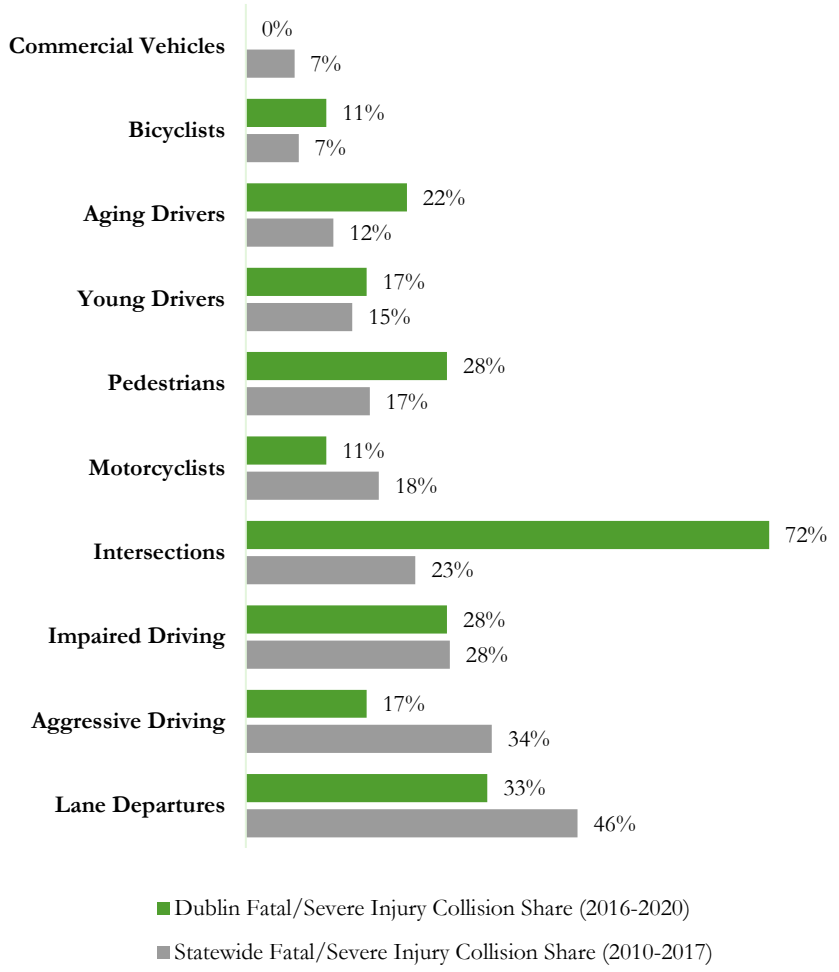
Traffic safety is a priority in Dublin, and collision data help identify where safety improvements are needed the most.

The California Office of Traffic Safety provides comparative crash rankings for cities statewide. For 2019, the most recent year comparisons are available, Dublin ranked in the best-performing 40th percentile (i.e., fewest injury/fatal collisions) of similarly sized California cities.[7] Because Dublin is a rapidly growing urban city, it shows some expected safety trends (pedestrian involvement and intersection collisions) when compared to the state as a whole. The city's fatal and severe injury collisions—18 reported from 2016 through 2020 –are trending at least 10 percent higher than the State average in three areas:

- Aging Drivers
- Pedestrians
- Intersections

The share of fatal and severe injury collisions that occur at intersections in Dublin is about three times higher than the statewide average (72 percent compared to 23 percent) (see Figure 5).

**Figure 5. Dublin Collisions Compared to Statewide Average in Challenge Areas.**




[7] California Office of Traffic Safety Crash Rankings are available online at https://www.ots.ca.gov/media-and-research/crash-rankings-results/.

These collisions predominately occur at intersections of arterial and minor roadways. Five of the SHSP high-priority areas align with this LRSP's emphasis areas and goals: intersections, pedestrians, bicyclists, impaired driving, and speed management/aggressive driving.

Some of the differences between the city's collisions and the statewide average simply come from Dublin being an urban area and much of California being rural. Because cities have more intersections and larger populations, they also have more potential for collision conflict and more people walking and biking.

(For a complete discussion of collisions in Dublin, see Appendix B.)

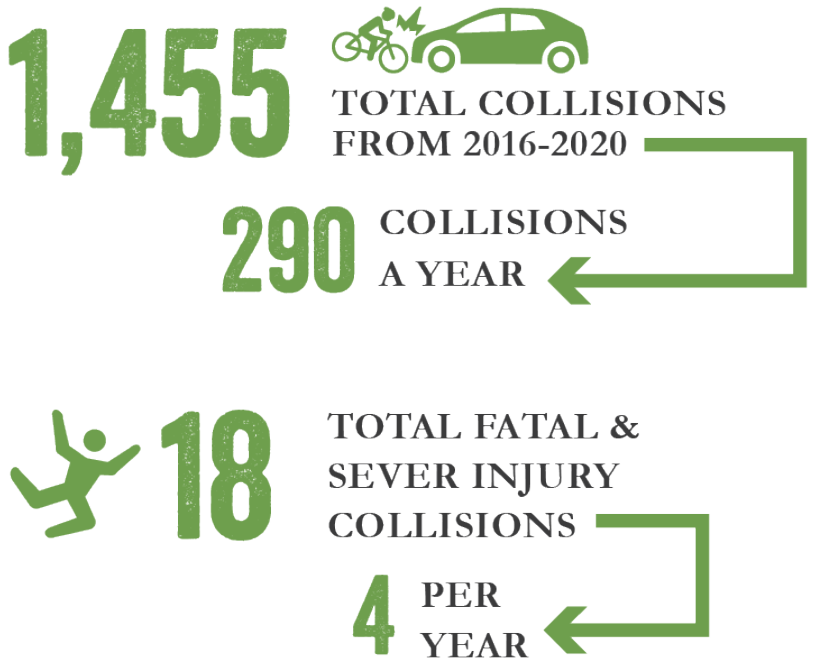
### About the Data

To assess citywide safety performance, the project team analyzed collision patterns and identified priority intersections and roadways using a location-specific network screening. This analysis used reported collision data from 2016 through 2020. At the time of analysis, 2020 was the most recent year for which complete collision data were available.

# Descriptive Trends Analysis

Analysis of reported collisions from the 2016 to 2020 Statewide Integrated Traffic Records System (SWITRS) dataset identified Dublin's high-priority emphasis areas for safety improvement.[8] The emphasis areas guide LRSP recommendations and project prioritization to maximize limited resources to improve safety.

## Reported Collisions in Dublin, 2016–2020




[8] California Highway Patrol's SWITRS database collects and process data from collision scenes. Scene data includes information such as location, date, and collision type. For more, visit https://www.chp.ca.gov/programs-services/services-information/switrs-internet-statewide-integrated-traffic-records-system.

In this analysis, fatal and severe injury collisions are generally grouped together because the difference between death and a severe injury can depend on factors such as emergency response time or the victim's health rather than the collision type.

## Understanding Collision Severity

Collision severity is coded according to the highest degree of injury experienced.

**Fatal—**A person dies due to injuries sustained in the collision.

**Serious Injury—**A person has major, visible injuries like broken bones, severe lacerations, or other injuries that go beyond the reporting officer's assessment of "other visible injuries."

**Moderate Injury**—A person has significant and visible injuries like bruises or minor lacerations. Moderate injury collisions are sometimes referred to as "other visible injury" collisions.

**Minor Injury**—A person has injuries that are not apparent from the outside. Examples include limps, neck pain, or confusion. Minor injury collisions are sometimes referred to as "compliant of pain" or "suspected injury" collisions.

**Property Damage Only (PDO)—**There were no injuries sustained.

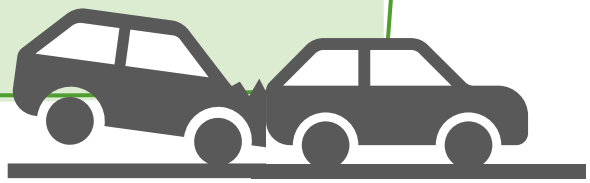
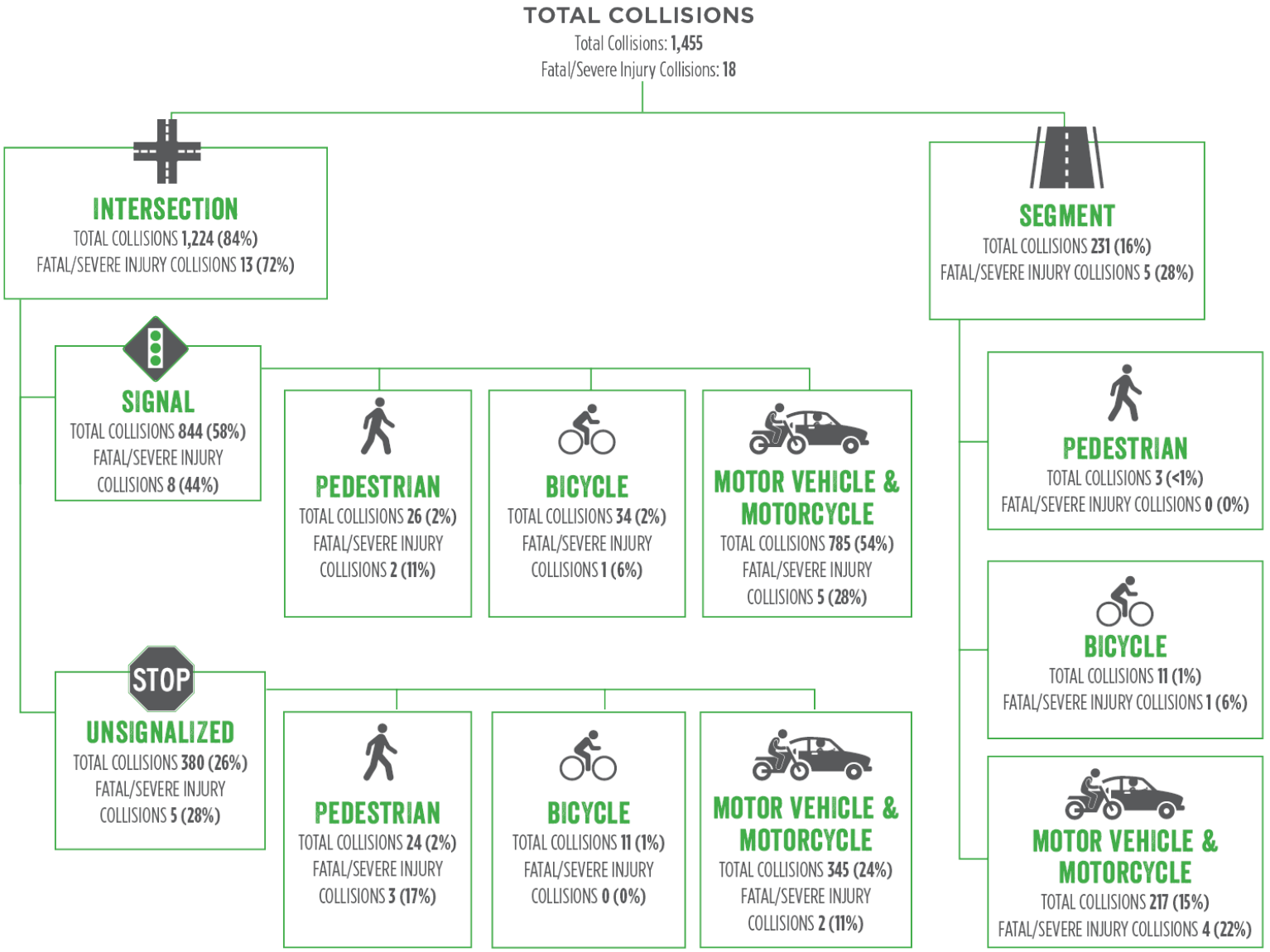


Figure 6. Collision Tree: Dublin Collisions by Location, Severity, and Mode




*Reported collisions by location, City of Dublin, January 2016 - December 2020*

## KEY TAKEAWAYS

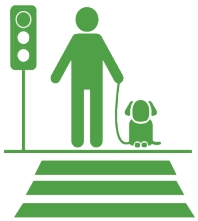
### INTERSECTIONS ARE HIGHER RISK LOCATIONS

**84%** of reported collisions **& 72%** of fatal and severe injury collisions

**OCCURRED AT AN INTERSECTION**

**MORE THAN 1/3**

of fatal and severe injury collisions in Dublin occur at an intersection and involve a pedestrian or bicyclist.



**MORE THAN 1/2**

of Dublin's pedestrian collisions—and all of its fatal pedestrian collisions—occurred while the pedestrian was crossing in a crosswalk at an intersection.

**Signalized intersections are the most common location for general collisions and fatal/severe injury collisions.**

### VULNERABLE ROAD USERS

**53** COLLISIONS INVOLVED PEDESTRIANS

**5** of which were fatal or severe injury collisions (4% of total collisions but 28% of fatal and severe injury citywide).

**56** COLLISIONS INVOLVED BICYCLISTS

**2** of which were severe injury collisions (4% of total reported but 11% of fatal and severe injury citywide).

### TIME OF COLLISIONS

**ALTHOUGH MOST COLLISIONS OCCUR IN DAYLIGHT CONDITIONS**

**MORE THAN 1/2**

of fatal or severe injury collisions occur in dark or dusk conditions

A majority of **pedestrian fatal and severe injury collisions occur in dark or dusk conditions.**



### PRIMARY COLLISION FACTORS

Reported primary collision factors (PCFs) convey the violation or underlying causal factor for a collision. Although there are often multiple causal factors, a reporting officer at the scene of a collision indicates a single relevant PCF related to a California Vehicle Code violation.

# COLLISION TYPES AND FACTORS

## MOST FREQUENT COLLISION TYPES

- Rear end
- Broadside
- hit object

## RESULTING IN OF FATAL AND SEVERE INJURY

- Vehicle/Pedestrian
- Hit object

## MOST COMMON REPORTED PRIMARY COLLISION

Unsafe Speed

Improper Turning

Automobile right of way violation

**Together these account for more than 50% of all reported collisions.**

NEARLY **20%** of Dublin's fatal and severe injury collisions involved alcohol or drugs

**75%**

### OF REAR END COLLISIONS

are most frequently associated with unsafe speed

**68%**

### OF HIT OBJECT COLLISIONS

are caused by three PCFs: improper turning, unsafe speed, and driving/ bicycling under the influence.

### OF BROADSIDE COLLISIONS

**32%**

are associated with automobile right of way

**33%**

are associated with traffic signals and signs

**Broadside collisions are likely associated with driveway access or intersections.**

**51%**

### OF VEHICLE/PEDESTRIAN COLLISIONS

are attributed to either a pedestrian or a driver violating the other's right of way.

Figure 7: Collisions by Type and Severity

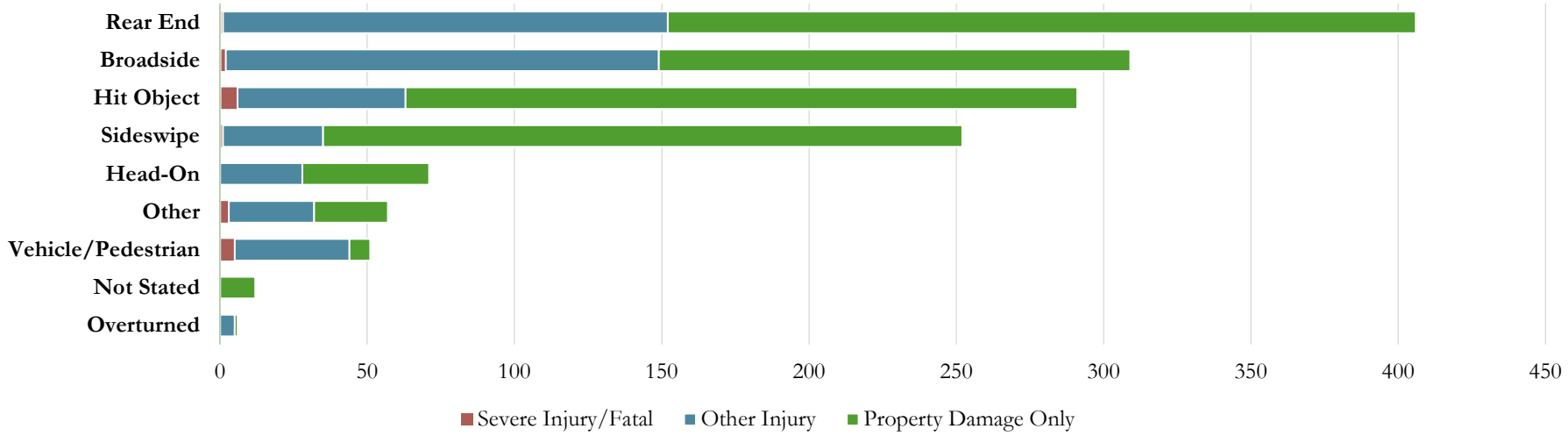
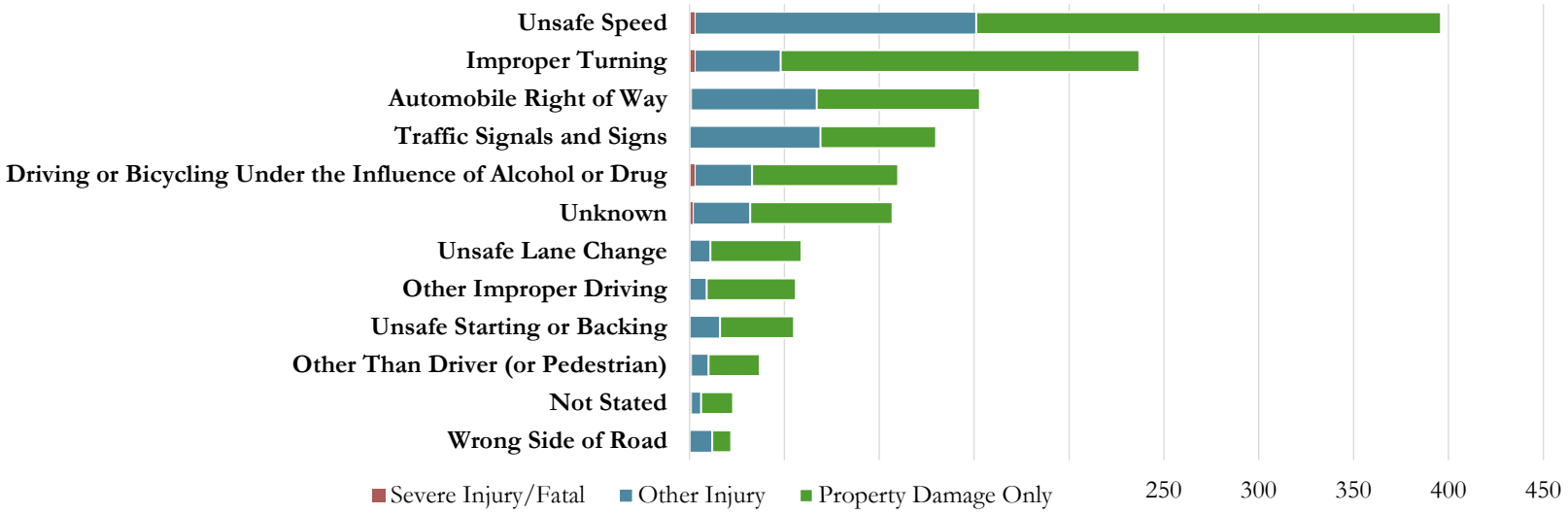



Figure 8: Collisions by Reported Primary Collision Factor



## RECOMMENDED EMPHASIS AREAS

According to Dublin's collision patterns identified in the descriptive trends analysis, the greatest opportunity to improve city roadway safety is to target the following emphasis areas:

- **Pedestrian Collisions**
- **Nighttime Safety**
- **Aging Drivers (65 and Older)**
- **Signalized Arterial and Minor Roadway Intersections**
- **Aggressive and Impaired Driving**

## Priority Intersections and Roadways




After mapping collision data, a network screening was conducted to identify intersections and roadway segments with the highest collision frequency and severity.

Priority locations were first based on the relative frequency and severity of collisions and then refined to emphasize locations with common characteristics associated with citywide emphasis areas. For example, the project team revised the list to prioritize signalized intersections on arterial roadways, locations with pedestrian collisions, and other emphasis areas with collision history.

Improvements have been identified for these 15 priority intersections and 5 priority roadway segments (shown in the table and map on the next pages).

Table 1: Top 20 Priority Locations

| # | Location** | Location Type[1] | Annualized Collision Severity Score[2] | Total | Fatal and Severe Injury Crashes | Average Collision Rate[3] | Caltrans Average Collision Rate for Reference Population[4] |
|---|---|---|---|---|---|---|---|
| 1 | **Dublin Blvd & Arnold Rd** | SI | 59.9 | 17 | 2 | 0.29 | 0.42 |
| 2 | **Dublin Blvd & Village Pkwy** | SI | 49.4 | 43 | 1 | 0.55 | 0.42 |
| 3 | **Dublin Blvd & Donlon Way** | UI | 42.1 | 6 | 1 | 0.21 | 0.24 |
| 4 | **San Ramon Rd & Amador Valley Blvd** | SI | 41.1 | 18 | 1 | 0.30 | 0.42 |
| 5 | **Dublin Blvd & Dougherty Rd** | SI | 37.2 | 65 | 0 | 0.48 | 0.42 |
| 6 | **Dougherty Rd (north of Willow Creek Dr to south of 8th St), 0.75 mi** | R | 36.2 | 8 | 1 | 0.17 | 1.34 |
| 7 | **Fallon Rd (Signal Hill Dr to Gleason Dr) – 0.75 mi** | R | 35.5 | 4 | 1 | 0.30 | 1.34 |
| 8 | **Village Pkwy (northern city limits to north of Tamarack Dr), 0.69 mi** | R | 35.3 | 8 | 1 | 0.55 | 1.34 |
| 9 | **Amador Valley Blvd (Burton St to Dougherty Rd) – 0.75 mi** | R | 34.1 | 3 | 1 | 0.18 | 1.27 |
| 10 | **Regional St (Amador Valley Blvd to south of Saint Patrick Way), 0.40 mi** | R | 33.9 | 6 | 1 | 1.20 | 1.27 |
| 11 | **San Ramon Rd & Shannon Ave** | SI | 29.3 | 8 | 1 | 0.21 | 0.42 |
| 12 | **Dublin Blvd & Dublin Ct** | SI | 27.3 | 13 | 1 | 0.18 | 0.42 |
| 13 | **Dublin Blvd & Tassajara Rd** | SI | 25.8 | 34 | 0 | 0.45 | 0.42 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **14** | **Central Pkwy & Grafton St** | SI | 24.3 | 3 | 1 | 0.32 | 0.42 |
| **15** | **Hacienda Dr & Martinelli Way*** | SI | 18.5 | 28 | 0 | 0.44 | 0.42 |
| **16** | **Dublin Blvd & Hacienda Dr** | SI | 16.6 | 33 | 0 | 0.47 | 0.42 |
| **17** | **Dougherty Rd & Sierra Ln** | SI | 15.6 | 23 | 0 | 0.43 | 0.42 |
| **18** | **Dublin Blvd & San Ramon Rd** | SI | 14 | 35 | 0 | 0.33 | 0.42 |
| **19** | **Village Pkwy & Amador Valley Blvd** | SI | 13.3 | 17 | 0 | 0.32 | 0.42 |
| **20** | **Dublin Blvd & Sierra Ct** | SI | 13.2 | 21 | 0 | 0.27 | 0.42 |

[1] SI=signalized intersection; UI=unsignalized intersection; R=roadway

[2] Severity score is calculated based on Caltrans costs of collision outcomes and is normalized to be expressed in terms of equivalent property damage only collisions (PDOs). The relative severity values are as follows: fatal/severe injury collisions are 119.9 equivalent PDOs at signalized intersections, 190.8 at unsignalized intersections, and 165.2 along roadways; moderate injuries are 10.7; and minor injuries are 6.1. For example, a signalized intersection with an annualized crash severity score of 48, for example, could represents the equivalent of 48 PDO collisions per year, two fatal/severe injury collisions over 5 years (119.9*2/5 = 48), or some combination of severity levels resulting in the same score.

[3] Average Collision rate is presented for intersections as the number of collisions per million vehicles entering the intersections and for roadway segments as the number of collisions per million vehicle miles traveled along the roadway segment.

[4] References are based on statewide Caltrans state highway collision rates. For roadways, the comparison reference population is a three-year "Suburban roadways" average ending 2019; for intersections, the comparison reference population is a one-year (2019) collision rate for intersections by control type. The data used for comparison are available online at https://dot.ca.gov/programs/research-innovation-system-information/annual-collision-data.

Figure 9: Priority Locations Map




DUBLIN CALIFORNIA

KITTELSON & ASSOCIATES

Priority Locations
Dublin LRSP




# TOOLBOX

# TOOLBOX

Improving safety and addressing emphasis areas will take a coordinated effort and a combination of the available strategies presented in this section.

More information on countermeasures and strategies can be found in the Countermeasure Toolbox in Appendix C and the Strategy Toolbox in Appendix D.

## Available Countermeasures

These engineering countermeasures are proven effective treatments to reduce collision risk. Selected countermeasures were tailored to reduce collisions and improve safety for issues specific to Dublin's signalized intersections, unsignalized intersections, and roadways.

Identifying opportunities to implement these countermeasures can help address safety issues on Dublin's local roadways. Combining these countermeasures with non-engineering strategies can also target roadway user characteristics and behaviors.

### Proven Safety Countermeasures

Throughout this section, look for this icon:



This flag denotes that a recommendation is one of FHWA's **proven safety countermeasures**, a set of tools and strategies that are effective in reducing fatal and serious injuries on roadways. These tools address speed management, roadway departure collisions, intersections, and pedestrian and bicyclist safety. Some proven countermeasures—like local roadway safety plans—cut across categories.

For more, visit https://safety.fhwa.dot.gov/provencountermeasures/.

### Countermeasures vs. Strategies

**Countermeasures:** These are engineering infrastructure improvements that can be implemented to reduce the risk of collisions.

**Strategies:** These are non-engineering recommendations that can help address the other portions of a Safe System and build a culture of safety in Dublin.

# SIGNALIZED INTERSECTIONS

Table 2. Available Signalized Intersection Countermeasures

| Countermeasure (CM) Name | CM ID* | Documented Collision Reduction Factor** | Cost Estimate*** $—under $50,000 $$—$50,000–$100,000 $$$—greater than $100,000 | Applicable Emphasis Areas |
|---|---|---|---|---|
| **MOTOR VEHICLE TREATMENTS** | | | | |
| Add intersection lighting | S01† | 40% | $ | ● ● ● ● |
| Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number | S02† | 15% | $ | ● ● ● |
| Improve signal timing (coordination, phases, red, yellow, or operation) | S03‡ | 15% | $ | ● ● ● |
| Provide advanced dilemma-zone detection for high-speed approaches | N/A | N/A | $ | ● ● ● |
| Install left-turn lane and add turn phase | S06/S07† | 55% | $–$$$[l] | ● |
| Convert signal to mast arm (from pedestal-mounted) | S08 | 30% | $–$$[l] | ● ● |

| Countermeasure (CM) Name | CM ID* | Documented Collision Reduction Factor** | Cost Estimate*** $—under $50,000 $$—$50,000–$100,000 $$$—greater than $100,000 | Applicable Emphasis Areas |
|---|---|---|---|---|
| Install raised median on approaches | S12† | 25% | $[1] | ● ● |
| Create directional median openings to allow (and restrict) left turns and U-turns (signalized intersection) | S14† | 50% | $[1] | ● ● ● |
| Install flashing beacons as advance warning | S10† | 30% | $ | ● ● ● |
| Install raised pavement markers and striping (through intersection) | S09† | 10% | $ | ● ● ● ● |
| No Right Turn on Red (RTOR)[1] | N/A | N/A | $ | ● ● |
| Centerline hardening[1] | N/A | N/A | N/A | ● ● ● ● |
| Convert intersection to roundabout (from signal) | S16† | 35–67%** | Varies | ● ● ● |
| Install painted safety zone | N/A | N/A | $ | ● ● ● |
| **PEDESTRIAN AND BICYCLIST TREATMENTS** | | | | |
| Install pedestrian countdown signal heads | S17PB† | 25% | $ | ● ● |

| Countermeasure (CM) Name | CM ID* | Documented Collision Reduction Factor** | Cost Estimate*** | Applicable Emphasis Areas |
|---|---|---|---|---|
| | | | $—under $50,000<br>$$—$50,000–$100,000<br>$$$—greater than $100,000 |  |
| **Install pedestrian crossing** | S18PB† | 25% | $[II] | ● ● |
| **Install pedestrian scramble** | S19PB† | 40% | $ | ● ● |
| **Install advance stop bar before crosswalk (bicycle box)** | S20PB† | 15% | $ | ● ● |
| **Modify signal phasing to implement a leading pedestrian interval (LPI)** | S21PB† | 60% | $[III] | ● ● |

* CM ID refers to the Countermeasure ID from the Caltrans *Local Roadway Safety Manual* (April 2022, LRSM). If a CM ID is listed, the treatment is eligible for federal funding through HSIP and more information is available at Local Roadway Safety—A Manual for California's Local Road Owners. If a CM ID is not listed, the countermeasure is not funded through HSIP. Funding eligibility indicates the designated federal contribution level for approved HSIP projects in California associated with Caltrans HSIP Cycle 11. This is subject to change from one cycle to the next and should be confirmed with the State HSIP coordinator.

**Documented collision reduction factors are derived either from the *LRSM* or the FHWA's *Proven Safety Countermeasures* resource, unless otherwise noted. An "N/A" indicates that a documented, research-backed collision reduction factor does not exist.

*** Cost estimates developed based on safety projects and bid prices from 2019-2021. Costs do not include any additional construction, right-of-way, or soft costs. Construction costs continue to fluctuate and should be checked against more recent data if possible.

† Countermeasure is 90% through federal funding in the current HSIP cycle (Cycle 11, 2022).

‡ Countermeasure is 50% reimbursable through federal funding in the current HSIP cycle.

[I] Cost per approach

[II] Cost per crossing

[III] Cost includes countdown timer, controller, signal head, and software

# UNSIGNALIZED INTERSECTIONS

Table 3. Available Unsignalized Intersection Countermeasures

| Countermeasure (CM) Name | CM ID* | Documented Collision Reduction Factor** | Cost Estimate*** $—under $50,000 $$—$50,000–$100,000 $$$—greater than $100,000 | Applicable Emphasis Areas |
|---|---|---|---|---|
| **MOTOR VEHICLE TREATMENTS** | | | | |
| Add intersection lighting | NS01† | 40% | $ | ● ● ● |
| Create directional median openings to allow and restrict left-turns and U-turns | NS15† | 50% | $[I] | ● ● ● |
| Install painted safety zone | N/A | N/A | $ | ● ● |
| Install raised medians (refuge islands) | NS19PB† | 45% | $[II] | ● ● ● |
| Install or upgrade larger or additional stop signs or other intersection warning or regulatory signs | NS06† | 15% | $ | ● ● |
| Upgrade intersection pavement markings | NS07† | 25% | $ | ● ● |
| Install transverse rumble strips on approaches | NS10† | 20% | $[I] | ● ● ● ● ● |

| Countermeasure (CM) Name | CM ID* | Documented Collision Reduction Factor** | Cost Estimate*** $—under $50,000 $$—$50,000–$100,000 $$$—greater than $100,000 | Applicable Emphasis Areas |
|---|---|---|---|---|
| **Install splitter islands on the minor roadway approaches** | NS13† | 40% | $[I] | ● ● ● ● |
| **PEDESTRIAN TREATMENTS** | | | | |
| **Install pedestrian crossing at uncontrolled locations (with enhanced safety features)** | NS21PB† | 35% | $ | ● ● |
| **Install pedestrian signal or pedestrian hybrid beacon** | NS23PB† | 55% | $$$ | ● ● ● |

* CM ID refers to the Countermeasure ID from the Caltrans *Local Roadway Safety Manual* (April 2022, LRSM). If a CM ID is listed, the treatment is eligible for federal funding through HSIP and more information is available at Local Roadway Safety - A Manual for California's Local Road Owners. If a CM ID is not listed, the countermeasure is not funded through HSIP. Funding eligibility indicates the designated federal contribution level for approved HSIP projects in California associated with Caltrans HSIP Cycle 11. This is subject to change from one cycle to the next and should be confirmed with the State HSIP coordinator.

**Documented collision reduction factors are derived either from the *LRSM* or the FHWA's *Proven Safety Countermeasures* resource, unless otherwise noted. An "N/A" indicates that a documented, research-backed collision reduction factor does not exist.

*** Cost estimates cover the countermeasure only and do not include any additional construction, right-of-way, or civil costs.

† Indicates that the countermeasure is eligible for 90% reimbursement through federal funding in the current HSIP cycle (Cycle 11, 2022). This is subject to change from one cycle to the next and should be confirmed with the State HSIP coordinator.

[I] Cost per approach

[II] Cost per square foot

# ROADWAYS

Table 4. Available Roadway Countermeasures

| Countermeasure (CM) Name | CM ID* | Documented Collision Reduction Factor | Cost Estimate*<br>$—under $50,000<br>$$—$50,000–$100,000<br>$$$—greater than $100,000 | Applicable Emphasis Areas |
|---|---|---|---|---|
| **MOTOR VEHICLE TREATMENTS** | | | | |
| Add lighting | R01† | 35% | $[I] | ● ● |
| Use a roadway diet (reduce travel lanes from 4 to 3 and add a two way left-turn and bike lanes) | R14† | 30% | $[II] | ● ● ● ● |
| Corridor access management | N/A | Varies | Varies | ● ● |
| Install edgeline rumble strips or stripes | R31† | 15% | $[II] | ● ● ● ● ● |
| Install delineators, reflectors, and/or object marker | R27† | 15% | $ | ● ● ● |
| Install/upgrade signs with new fluorescent sheeting (regulatory or warning) | R22† | 15% | $ | ● ● ● |

| Countermeasure (CM) Name | CM ID* | Documented Collision Reduction Factor | Cost Estimate*<br>$—under $50,000<br>$$—$50,000–$100,000<br>$$$—greater than $100,000 | Applicable Emphasis Areas |
|---|---|---|---|---|
| Install speed feedback signs | R26† | 30% | $ | ● ● ● |
| **PEDESTRIAN AND BICYCLIST TREATMENTS** | | | | |
| Install or upgrade pedestrian crossing with enhanced safety features | R35PB† | 35% | $ | ● ● |
| Install raised pedestrian crossing | R36PB† | 35% | $$ | ● ● |
| Install separated bike lanes | R33PB† | 45% | $$[III] | ● ● ● |

* CM ID refers to the Countermeasure ID from the Caltrans *Local Roadway Safety Manual* (April 2022, LRSM). If a CM ID is listed, the treatment is eligible for federal funding through HSIP and more information is available at Local Roadway Safety - A Manual for California's Local Road Owners. If a CM ID is not listed, the countermeasure is not funded through HSIP. Funding eligibility indicates the designated federal contribution level for approved HSIP projects in California associated with Caltrans HSIP Cycle 11. This is subject to change from one cycle to the next and should be confirmed with the State HSIP coordinator.

**Documented collision reduction factors are derived either from the *LRSM* or the FHWA's *Proven Safety Countermeasures* resource, unless otherwise noted. An "N/A" indicates that a documented, research-backed collision reduction factor does not exist.

*** Cost estimates cover the countermeasure only and do not include any additional construction, right-of-way, or civil costs.

† Indicates that the countermeasure is eligible for 90% reimbursement through federal funding in the current HSIP cycle (Cycle 11, 2022).

[I] Cost per light

[II] Cost per mile

[III] Cost per foot

# INNOVATIVE IDEA

## QUICK BUILD AND DEMONSTRATION PROJECT GUIDANCE

Agencies around the country use quick build and demonstration projects to improve roadway user safety. Sometimes called tactical urbanism, quick builds and demonstration projects use easy-to-install materials like paint or posts that test flexible solutions to traffic or safety issues.[9]

Quick builds offer Dublin easy and cost-effective ways to prevent pedestrian collisions, improve nighttime safety, and improve signalized arterial and minor roadway intersections. PeopleForBikes' Quick Builds for Better Streets and the Street Plans Collaborative's Tactical Urbanist's Guide to Materials and Design provide excellent guidance for implementing quick builds.

**Potential partners**: Local Community Organizations (see Appendix A), Dublin Unified School District, and the Office of Communications



**A quick-build parklet on Grand Avenue, Oakland, CA**

[9] PeopleForBikes (2016). Quick Builds for Better Streets: A New Project Delivery Model for U.S. Cities, 2016PeoplefoBikes_Quick-Builds-for-Better-Streets.pdf (nacto.org)

# Available Strategies

Identifying opportunities to implement these non-engineering strategies can help support countermeasures and build a safety culture in Dublin. For complete descriptions of these strategies and their partners, see Appendix D. The strategies are organized into four categories; each is described below.



## EDUCATION

To build a culture of safety, the public should have access to traffic safety information. Public education and collaboration help bridge gaps in knowledge that influence roadway user behavior.



## EQUITABLE ENFORCEMENT

Even with engineering countermeasures in place, roadway users can fail to obey traffic laws and cause collisions of varying severity. Police enforcement has been traditionally used as a strategy to increase driver awareness, educate drivers on roadway violations, and reduce traffic collisions. However, if enforcement strategies are to improve overall safety in a community, traffic laws must be applied equitably. Directed enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities.

When rigorously evaluated for intent and impact, the following enforcement strategies can help provide equitable and successful outcomes:

- Speed Monitoring Trailers
- Progressive Ticketing
- Speed Enforcement in School Zones
- High Visibility Saturation Patrols
- Collision vs. Citation Evaluation Programs



## EMERGENCY SERVICES

In partnership with emergency medical services (EMS), the following strategies can improve regionwide response times and coordination by sharing real-time information:

- Local Hospital or Outreach Group Partnerships
- Emergency Services Coordination



## EMERGING TECHNOLOGIES

New traffic safety technology can enhance the benefits of Dublin's other engineering, education, enforcement, and emergency services efforts. Some helpful technologies include artificial intelligence and deep learning software, crosswalk motion sensors, also called PUFFIN crossings.




# RECOMMENDATIONS AND IMPLEMENTATION

# RECOMMENDATIONS AND IMPLEMENTATION

These treatments represent the improvements with the greatest potential to help reduce fatal and severe injury collisions and build a culture of safety in Dublin.

## Site Specific Treatments

This project matrix represents a list of high-priority, achievable improvements at priority locations. Locations were identified using the descriptive trends analysis. The matrix is organized by short-term, medium-term, and long-term opportunities. This list is not exhaustive, as many of these treatments can be applied elsewhere in Dublin.

**Table 5: Site-Specific Projects**

| Location | Location Type* | Low-Cost, Short-Term Countermeasures[1] | Medium-Cost, Medium-Term Countermeasures[1] | Higher-Cost, Long-Term Countermeasures[1] |
|---|---|---|---|---|
| **1. Dublin Blvd & Arnold Blvd** | SI | › S21PB. Implement leading pedestrian interval (LPI)<br>› Evaluate or consider implementing no right turn on red (RTOR) where right turn conflicts with pedestrian crossing<br>› Restripe as high visibility crosswalk (HVC)<br>› S03. Improve signal timing (coordination, phases, or operation). | › S02. Improve signal hardware<br>› Consider installing protected intersection elements | › Evaluate need for double left turn lane in eastbound direction and consider repurposing space.<br>› Consider realigning curb ramps so all marked crosswalks are perpendicular to travel lanes |

| Location | Location Type* | Low-Cost, Short-Term Countermeasures[1] | Medium-Cost, Medium-Term Countermeasures[1] | Higher-Cost, Long-Term Countermeasures[1] |
|---|---|---|---|---|
| **2. Dublin Blvd & Village Pkwy** | SI | › S21PB. Implement LPI<br>› Evaluate or consider implementing no RTOR where right turn conflicts with pedestrian crossing<br>› S03. Improve signal timing (coordination, phases, or operation) | › S02. Improve signal hardware<br>› Modify existing median for pedestrian refuge island<br>› Align crosswalk to remove skew, shorten crossing, and reduce curb radii<br>› Consider installing protected intersection elements | › Remove channelized right-turn lane in northbound direction. |
| **3. Dublin Blvd & Donlon Way[2]** | UI | › Install painted safety zone and centerline hardening. | › NS19PB: Install pedestrian refuge island<br>› Consider change of traffic control (evaluate warrants and consider roundabout) | |
| **4. San Ramon Rd & Amador Valley Blvd** | SI | › S21PB. Implement LPI<br>› Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing<br>› Restripe as High Visibility Crosswalk (HVC)<br>› S03. Improve signal timing (coordination, phases, or operation) | › Modify existing median for pedestrian refuge island and to reduce curb return radius<br>› Consider installing protected intersection elements | › Remove channelized right-turn lane in southbound and westbound directions |

| Location | Location Type* | Low-Cost, Short-Term Countermeasures[1] | Medium-Cost, Medium-Term Countermeasures[1] | Higher-Cost, Long-Term Countermeasures[1] |
|---|---|---|---|---|
| **5. Dublin Blvd & Dougherty Rd** | SI | › S21PB. Implement LPI<br>› Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing<br>› Restripe as HVC<br>› S03. Improve signal timing (coordination, phases, or operation) | › S09. Install raised pavement markers and striping within the intersection.<br>› R33PB. Install separated bike lanes in eastbound direction<br>› Consider installing protected intersection elements | › Corridor access management |
| **6. Dougherty Rd (south of Willow Creek Dr and north of Camp Parks Blvd),** 0.75 mi | R | › R26. Install speed feedback signs. | | › Corridor access management<br>› Evaluate need for double left-turn lane at Dougherty Road (northbound) and for U-turn lane at Dougherty Road (southbound); consider repurposing space |
| **7. Fallon Rd (Signal Hill Dr to Gleason Dr),** 0.75 mi | R | › R26. Install speed feedback signs | | › Evaluate need for pedestrian crossing at Turnberry Dr. |
| **8. Village Pkwy (northern city limits to north of Tamarack Dr),** 0.69 mi | R | › R26. Install speed feedback signs | › R33PB. Install separated bike lanes in southbound and northbound directions | |

| Location | Location Type* | Low-Cost, Short-Term Countermeasures[1] | Medium-Cost, Medium-Term Countermeasures[1] | Higher-Cost, Long-Term Countermeasures[1] |
|---|---|---|---|---|
| **9. Amador Valley Blvd (Burton St to Dougherty Rd),** 0.75 mi | R | › R26. Install speed feedback signs<br>› Evaluate or consider implementing no RTOR where right turn conflicts with pedestrian crossing<br>› Restripe as HVC. | › R33PB. Install buffered bike lanes in eastbound and westbound directions<br>› Consider installing protected intersection elements at signalized intersections<br>› Centerline hardening at intersection roadways<br>› Study need for marked crossing at Dublin Meadows Street; | |
| **10. Regional St (Amador Valley Blvd to south of Saint Patrick Way),** 0.40 mi | R | | › R33PB. Install buffered bike lanes in southbound and northbound directions<br>› Add midblock pedestrian crossing with enhanced safety features | › Corridor Access Management |
| **11. San Ramon Rd & Shannon Ave** | SI | › S21PB. Implement LPI<br>› Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing | › Modify existing median for pedestrian refuge island<br>› Consider installing protected intersection elements | › Reevaluate need for separate right-turn lanes on northbound and southbound approaches |

| Location | Location Type* | Low-Cost, Short-Term Countermeasures[1] | Medium-Cost, Medium-Term Countermeasures[1] | Higher-Cost, Long-Term Countermeasures[1] |
|---|---|---|---|---|
| **12. Dublin Blvd & Dublin Ct**[3] | SI | › S21PB. Implement LPI<br>› Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing | › S02. Improve signal hardware<br>› Consider installing protected intersection elements | |
| **13. Dublin Blvd & Tassajara Rd** | SI | › S21PB. Implement LPI across southbound, eastbound, and westbound legs<br>› Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing<br>› Restripe as HVC<br>› S03. Improve signal timing (coordination, phases, or operation). | › S02. Improve Signal Hardware<br>› S09. Install raised pavement markers and striping within the intersection<br>› Consider installing protected intersection elements | |
| **14. Central Pkwy & Grafton St** | SI | › S21PB. Implement LPI<br>› Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing | › S02. Improve Signal Hardware<br>› Modify existing median for pedestrian refuge island<br>› Consider installing protected intersection elements | |

| Location | Location Type* | Low-Cost, Short-Term Countermeasures[1] | Medium-Cost, Medium-Term Countermeasures[1] | Higher-Cost, Long-Term Countermeasures[1] |
|---|---|---|---|---|
| **15. Martinelli Way & Hacienda Dr** | SI | › S21PB: Implement LPI; Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing. | › S02. Improve signal hardware.<br>› R33PB. Install separated bike lanes in southbound and northbound directions<br>› Consider installing protected intersection elements | › Corridor access management |
| **16. Dublin Blvd & Hacienda Dr** | SI | › Evaluate or consider implementing no RTOR where right turn conflicts with pedestrian crossing<br>› Restripe as HVC<br>› S03. Improve signal timing (coordination, phases, or operation) | › S02. Improve signal hardware<br>› S09. Install raised pavement markers and striping within the intersection | › Corridor access management |
| **17. Dougherty Rd & Sierra Ln[4]** | SI | › Evaluate or consider implementing no RTOR where right turn conflicts with pedestrian crossing<br>› Restripe as HVC<br>› Install painted safety zone.<br>› S03. Improve signal timing (coordination, phases, or operation). | › Install concrete curb radii reductions. | |
| **18. Dublin Blvd & San Ramon Rd** | SI | › Evaluate or consider implementing no RTOR where right turn conflicts with pedestrian crossing<br>› Restripe as HVC | › Consider installing protected intersection elements | |

| Location | Location Type* | Low-Cost, Short-Term Countermeasures[1] | Medium-Cost, Medium-Term Countermeasures[1] | Higher-Cost, Long-Term Countermeasures[1] |
|---|---|---|---|---|
| **19. Amador Valley Blvd & Village Pkwy** | SI | › S21PB. Implement LPI<br>› Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing<br>› Restripe as HVC<br>› S03. Improve signal timing (coordination, phases, or operation) | › S02. Improve signal hardware<br>› Consider installing protected intersection elements | › Remove channelized right turn lane in eastbound, southbound, and westbound directions |
| **20. Dublin Blvd & Sierra Ct** | SI | › Evaluate or consider implementing no RTOR with pedestrian signals where right turn conflicts with pedestrian crossing<br>› S21PB: Implement LPI<br>› S03 Improve signal timing (coordination, phases, or operation) | › S02. Improve signal hardware<br>› Consider installing protected intersection elements | |

* Signalized Intersection (SI); Unsignalized Intersection (UI); Roadway (R)

1: Where provided, treatment IDs (e.g., "S21PB") indicate countermeasure (CM) IDs, which refer to the Countermeasure ID from the Caltrans *Local Roadway Safety Manual* (*LRSM*) (April 2022). If a CM ID is listed, the treatment is eligible for federal funding through HSIP and more information is available at **Local Roadway Safety—A Manual for California's Local Road Owners**. If a CM ID is not listed, the countermeasure is not funded through HSIP. Funding eligibility indicates the designated federal contribution level for approved HSIP projects in California associated with Caltrans HSIP Cycle 11. This is subject to change from one cycle to the next and should be confirmed with the State HSIP coordinator.

2: Intersection improvements installed in 2018 (Rectangular Rapid Flashing Beacon)

3: Location includes at least one private roadway

4: Intersection improvements installed in 2019 (Class II bike lanes installed through along Dougherty Road and constructed median installed along north leg of intersection)

# LEADING PEDESTRIAN INTERVALS & RIGHT-TURN-ON-RED RESTRICTIONS

## Emphasis Areas Addressed



When paired, leading pedestrian intervals (LPIs), or variations on that treatment, and right-turn-on-red restrictions are a low-cost treatment that can be applied systemically to reduce the risk of pedestrian collisions, especially in areas with a high level of existing or anticipated pedestrian activity (see Figure 10). Research has shown that LPIs may lose their intended benefits when right turns on red that conflict with the crossing are not restricted.[10] When using an LPI, right turns on red should be restricted parallel and perpendicular to the treated crossings, since right-turning drivers from both streets would otherwise proceed and conflict with crossing pedestrians.

At some locations—particularly those near freeways with highly peaking traffic and with very high volumes of right turns (exceeding 200 vehicles per hour)—traffic operations and queueing may be a concern. *NCHRP Report 969: Traffic Control Strategies for Pedestrians and Bicyclists* explains some options for these locations:

- For LPIs providing a head-start along a minor street, adding an LPI typically has no effect on traffic operations.
- LPIs and right-turn-on-red restrictions can be implemented for certain times of day.
- At locations with very high volumes of right turns, full protection between vehicle and pedestrian movements may be preferred. *NCHRP Report 969* offers information on such options.[11]
- If the pedestrian phase is push-button actuated, then the additional LPI phase will only be triggered when a pedestrian is present.

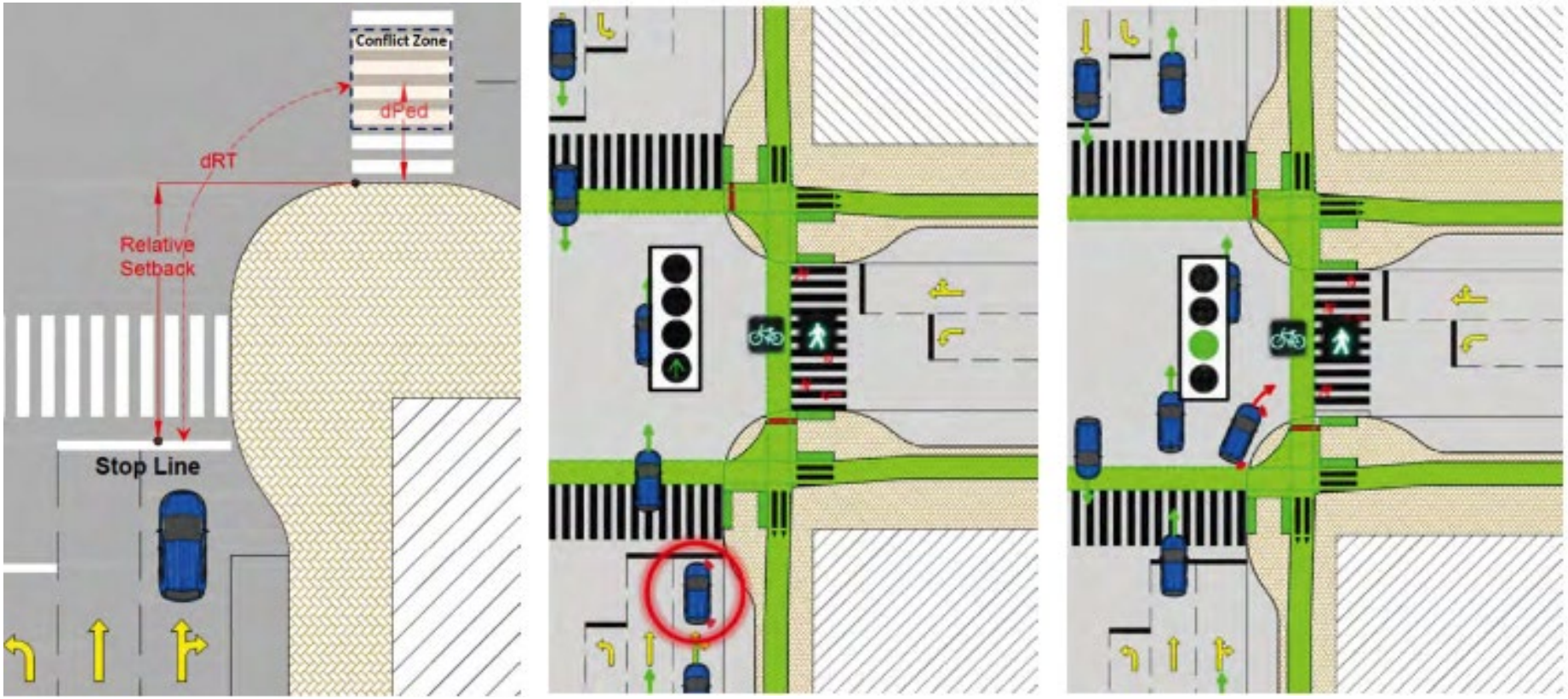
[10] Hubbard, Sarah ML, Darcy M. Bullock, and John H. Thai. "Trial implementation of a leading pedestrian interval: lessons learned." *ITE journal* 78.10 (2008): 32.

[11] The report is available online at https://www.trb.org/Main/Blurbs/182635.aspx

## EXTENDING THE WAITING AREA

A typical LPI is anywhere from 3 to 7 seconds, but the length of an LPI may be determined by how long it takes a pedestrian to reach the conflict zone (see Figure 10). If a pedestrian waiting area is far enough ahead of the stop line, the LPI may be very short or unnecessary.

**Figure 10: Geometric Requirements that Govern Leading Pedestrian Interval Timing (left); Leading Through Interval Application (center and right)**




Note: dPed = the distance a pedestrian covers to reach the middle of the conflict zone

dRT = the distance a right-turning vehicle covers to reach the middle of the near edge of the conflict zone

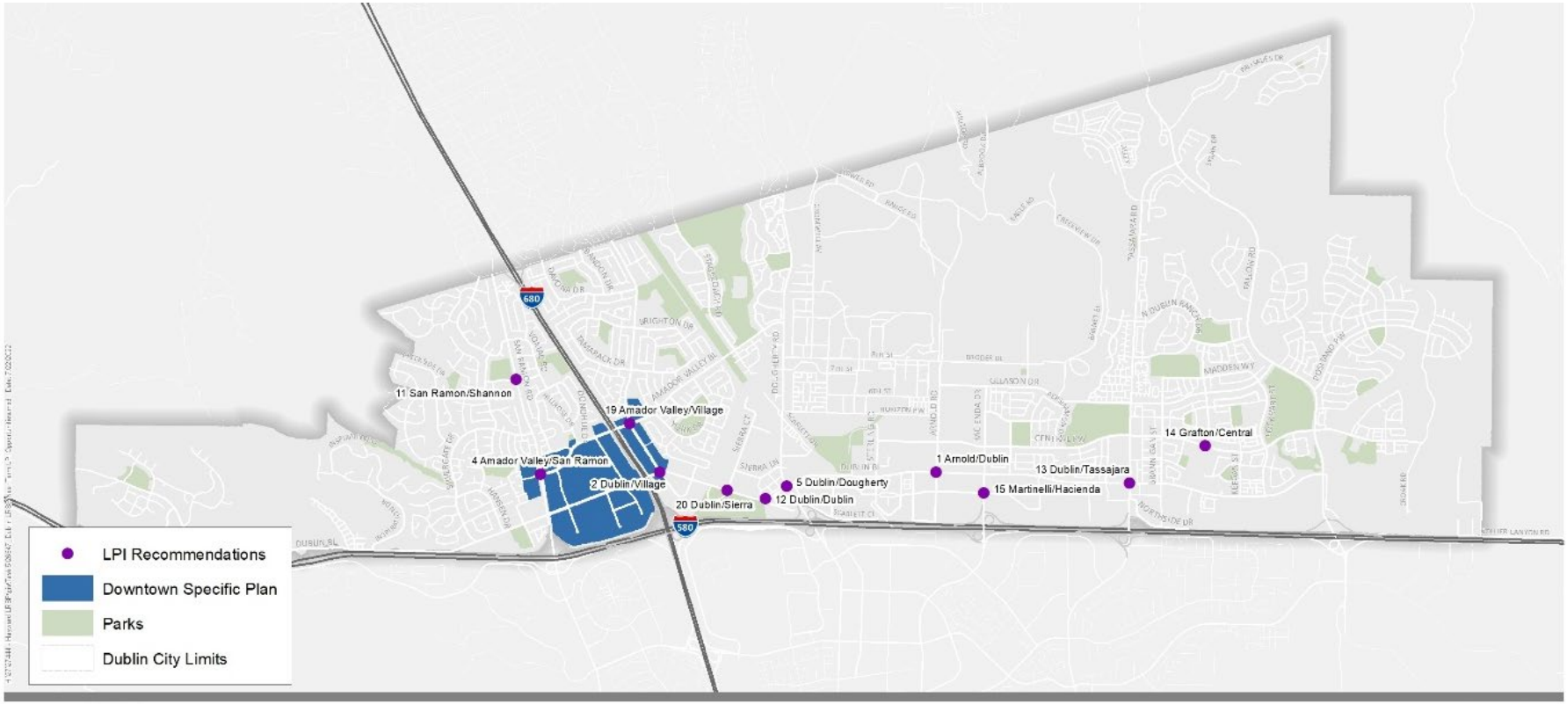
*Source: NCHRP Report 969*

## LEADING THROUGH INTERVAL

Leading through intervals (LTIs) allow vehicle through movements, pedestrian movements, and bicycle movements to proceed while holding left and right turns long enough for pedestrians to have a partially protected crossing. The LTI can be implemented with or without exclusive right-turn lanes (see Figure 9). *NCHRP Report 969* also recommends other applications, including when full protection should be considered.

The locations shown in Figure 10 are initial candidates for implementing LPIs and right-turn-on-red restrictions. The City may choose to evaluate these locations to compare queueing impacts of implementing LPI or LTI at these locations against the safety benefits of providing the treatment. There may be other locations identified with a high level of existing or anticipated pedestrian activity as part of future plans or development review; this treatment may also be appropriate at such locations.

Figure 11. Near-Term Leading Pedestrian Interval Opportunities




DUBLIN CALIFORNIA

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Near-Term Leading Pedestrian Interval Opportunities
Dublin LRSP

# NIGHTTIME VISIBILITY

Two key engineering countermeasures can help improve nighttime safety in Dublin: (1) roadway and pedestrian-scale lighting, and (2) signal visibility improvements.

## ROADWAY AND PEDESTRIAN-SCALE LIGHTING

### Emphasis Areas Addressed



In general, Dublin has lighting along roadways, at intersections, and at crossings. Along roadways with four or more lanes, supplemental pedestrian-scale lighting may be required to adequately light the sidewalk and crossing locations.

The 2022 FHWA *Pedestrian Lighting Primer* offers design criteria for pedestrian lighting and outlines a process for creating local pedestrian lighting standards based on pedestrian facility type and pedestrian activity. The primer includes a flowchart to help determine suitable pedestrian lighting applications (see Figure 12). The American Association of State Highway and Transportation Officials (AASHTO) *Roadway Lighting Design Guide, 7th Edition* also offers roadway lighting guidelines and criteria. These processes and criteria that are simply provided as examples.

Reviewing this guidance, considering amending or adopting local standards with respect to pedestrian lighting, and conducting a lighting review at locations identified in the Implementation section of this LRSP will help promote nighttime pedestrian safety throughout the city.

**Figure 12: Example Pedestrian-Scale Lighting. Source: 2012 Seattle DOT *Pedestrian Lighting Citywide Plan***

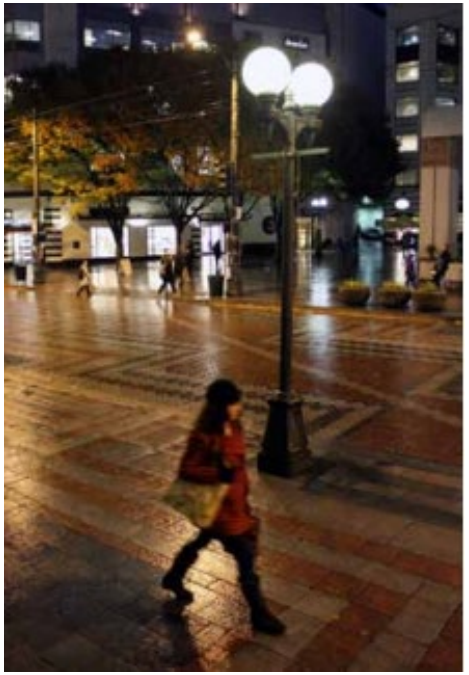
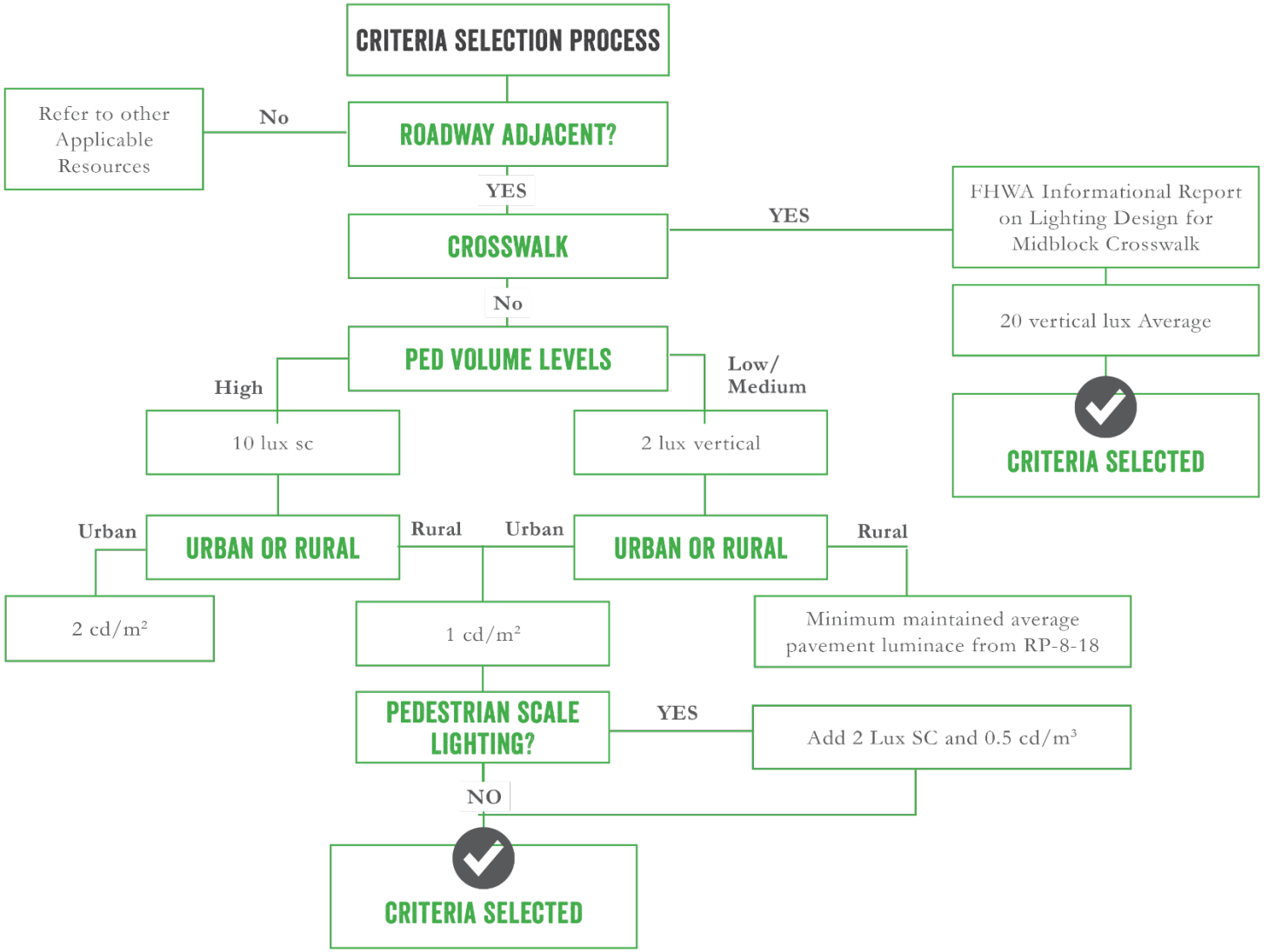


Figure 13 on the following page shows locations that meet the following criteria:

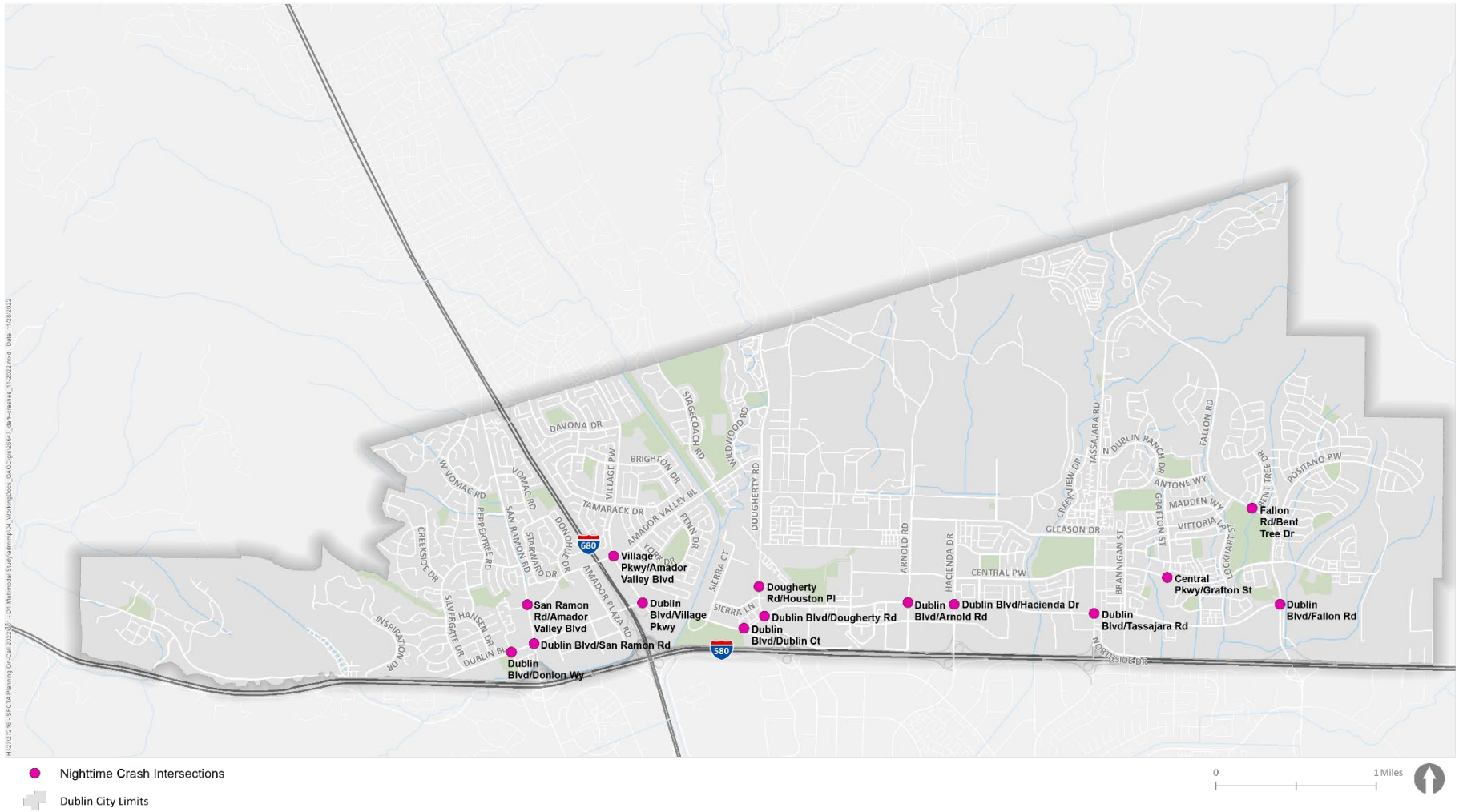
- Annualized collision severity score of at least 10 (an average of approximately 10 property-damage-only collisions per year, or one moderate injury collision per year); and at least
- One third of collisions occurring at night or one fatal/severe injury collision occurring at night

Figure 13: Recommended Pedestrian Lighting Criteria Selection Flowchart.




Source: 2022 FHWA *Pedestrian Lighting Primer*

Figure 14. Nighttime Collision Priority Intersections




**Nighttime Crash Priority Intersections**
**Dublin Local Roadway Safety Plan**
**Dublin, CA**

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## SIGNAL VISIBILITY IMPROVEMENTS

### Emphasis Areas Addressed



At signalized intersections, simple hardware improvements can improve signal visibility and address patterns of broadside, rear-end, nighttime, and red-light-running collisions. These hardware upgrades improve signal visibility and have been shown to reduce related collisions by as much as 15 percent:

- **Lenses with LED lighting** increase traffic signal visibility.
- **Back-plates with retroreflective borders** improves signal head visibility during daytime and nighttime conditions.
- **Mounting** assemblies include mast arms, span wires, and side-mounted vehicular signals. Upgrading the mounting assembly may improve signal hardware longevity.
- **Larger lenses** may improve signal visibility.

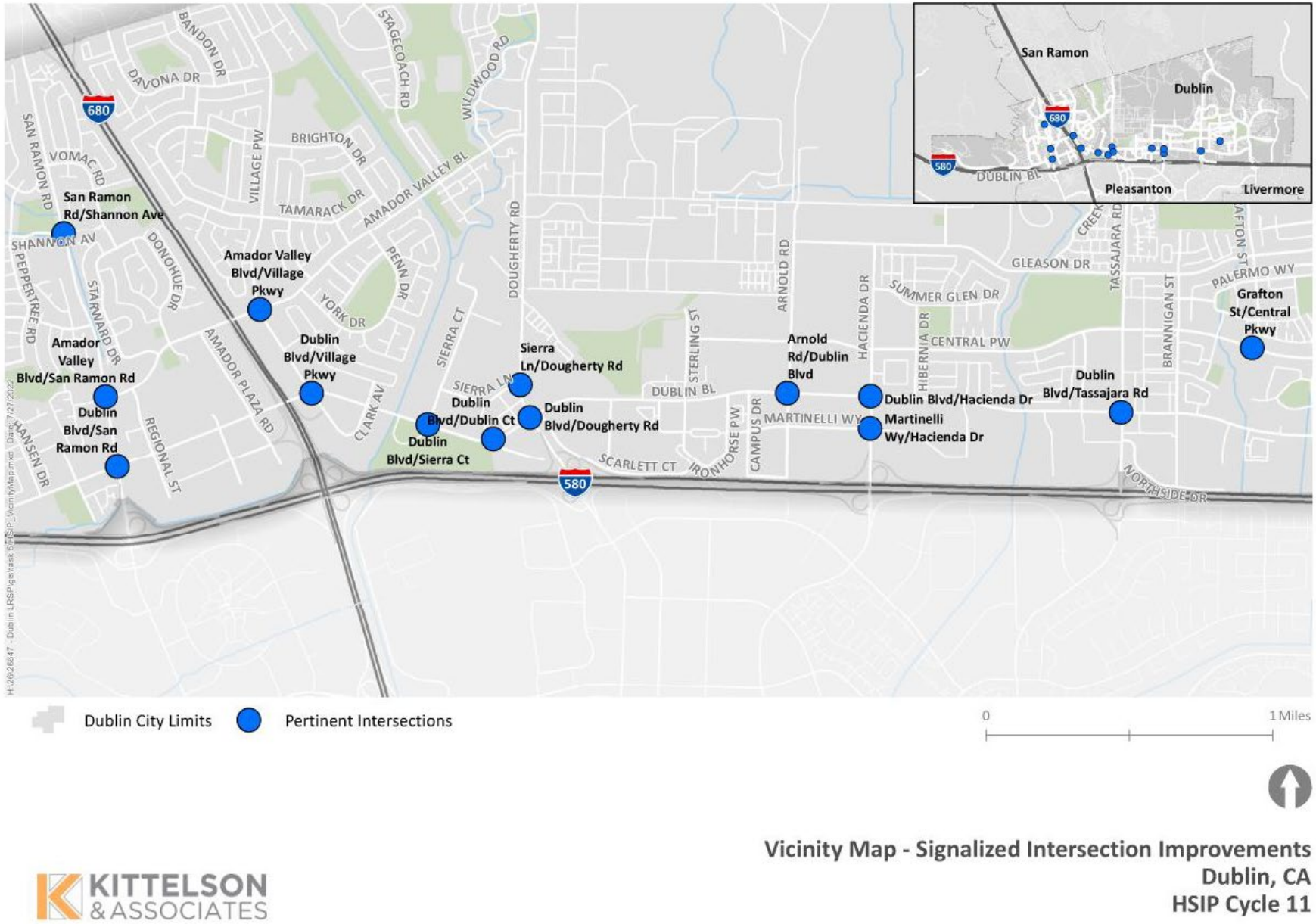
HSIP Cycle 11 funding was pursued in September 2022 to improve signal hardware at 14 signalized intersections, primarily along arterials and the HIN (see Figure 15). Locations where this treatment can be proactively applied should continue to be identified.

**Figure 15: Retroreflective backplates improve signal visibility.**



*Source: Eliobed Suarez on Unsplash.*

Figure 16: Signal Hardware Improvement Locations Identified for HSIP Cycle 11




Vicinity Map - Signalized Intersection Improvements
Dublin, CA
HSIP Cycle 11

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# OTHER SYSTEMIC OPPORTUNITIES

## CENTERLINE HARDENING

### Emphasis Areas Addressed



Centerline hardening is an intersection treatment that reduces the speed of turning vehicles and improves pedestrian visibility. The basic hardened centerline treatment consists of five pieces of rubber curb and bollards and/or rubber speed bumps installed on the centerline and extending at a maximum of six feet into the intersection. The treatment can be implemented in a low-cost fashion with quick-build materials.

Because centerline hardening can calm left turns, this treatment can be proactively implemented at intersections with left-turn geometry that otherwise allow for high-speed left turns.

**Figure 17. Centerline Hardening Example in Oakland, California**



*Source: Kittelson and Associates, Inc.*

# Action Items and Performance Measures

Aligning action items with goals and identifying metrics for measuring success helps track progress toward a safer Dublin for everyone. The listed performance measures can be used in subsequent plan updates to assess progress.

**Table 6. Goals, Action Items, and Performance Measures**

| Goal | Action Items | Performance Measures |
|---|---|---|
| **IMPLEMENT SAFETY COUNTERMEASURES TO REDUCE RISK OF FUTURE COLLISIONS.** | **Near Term and Ongoing**<br>• Identify opportunities to implement short-term countermeasures at prioritized locations (see Site Specific Treatments).<br>• Study the need for roadway and pedestrian-scale lighting at the prioritized locations with nighttime collision history (see Figure 13 on page 59)<br>• Pursue HSIP and Safe Streets and Roads for All (SS4A) grant funding<br>**Long Term**<br>• Identify opportunities to implement low-cost, systemic application countermeasures identified in this plan as part of all projects (such as development review, repaving, and new projects)<br>• Track future grant opportunities and pursue safety project grants with each available funding cycle (see Appendix F: Funding)<br>• Revisit medium- and long-term countermeasures (see Site Specific Treatments) for inclusion in City's Capital Improvement Program or for future grant funding opportunities (see Appendix F: Funding) | ✓ Number of fatal and injury collisions (all levels) in identified emphasis areas<br>✓ Number of fatal and severe injury collisions citywide<br>✓ Grant money received for safety projects<br>✓ Annual expenditure on safety improvements |



| Goal | Action Items | Performance Measures |
|---|---|---|
| **ANALYZE DATA TO IDENTIFY AND PRIORITIZE OPPORTUNITIES.** | **Near Term and Ongoing**<br>• Review collision data in subsequent plan updates to evaluate progress on emphasis areas and for fatal/severe injury collision frequency.<br>• Compare the City's internal collision database with publicly available collision data in subsequent plan updates to identify potential missing collisions in either database.<br>• Continuously engage with the community to identify and document locations of concern, in recognition that collision data do not tell the whole story.<br><br>**Long Term**<br>• Update the LRSP goals and emphasis areas with subsequent plan updates.<br>• Evaluate need for traffic control change or additional crossing improvements at locations with anticipated growth (e.g., as part of development review) | ✓ Number of fatal and injury collisions (all levels) in identified emphasis areas<br>✓ Summary of feedback received (quantity, type, and location) regarding safety issues<br>✓ Number of safety improvements implemented at priority locations<br>✓ Number of systemic countermeasures applied to address emphasis areas |



| Goal | Action Items | Performance Measures |
|---|---|---|
| **PROMOTE A CULTURE OF ROADWAY SAFETY IN DUBLIN'S AGENCIES AND RESIDENTS.** | **Near Term and Ongoing**<br>• Continue to engage with Dublin schools through existing venues like the Traffic Safety Committee to plan and promote school educational training and encouragement using school resource officers, bicycle rodeos, or other events at Dublin schools.<br>• Establish educational programs to reduce driving under the influence and aggressive driving.<br>• Work with the City Office of Communications to regularly communicate with the public on roadway, pedestrian, and bicycle safety. Use findings in this plan to align messaging priorities with emphasis areas.<br>• Continue to coordinate with Dublin Police Services on location and emphasis areas and deploy speed trailers in mutually-agreed-upon HIN locations.<br><br>**Long Term**<br>• Continue to share best practices related to safety and coordinate with Alameda CTC and its member agencies.<br>• Continue to identify opportunities to acquire grant funds or partner with local advocacy organizations for other educational opportunities.<br>• Review City policies, standards, and guidelines, and identify updates that would promote evolving safety best practices. | ✓ Number of events hosted, and summary of educational activities led by the City<br>✓ Frequency of communication with identified partners on safety initiatives<br>✓ Recency of guidelines and standard drawings (revisit for updates at least every five years)<br>✓ Number of safety improvements implemented at priority locations |



# APPENDIX A: COMMUNITY STAKEHOLDERS

# COMMUNITY STAKEHOLDERS

This section presents community stakeholders which can be valuable for future safety-related engagement and outreach.

| Organization | Website | Number & Email |
|---|---|---|
| WHEELS | https://www.wheelsbus.com/ | 925-828-0231<br>info@lavta.org |
| Dial-a-Ride | https://www.wheelsbus.com/ | 925-455-7510<br>info@lavta.org |
| Bike East Bay | https://bikeeastbay.org/ | kristi@bikeeastbay.org |
| The Trail Group | Not Available | Not Available |
| Valley Spokesmen Bicycle Club | https://www.valleyspokesmen.org | 925-828-5299<br>webmaster@valleyspokesmen.org |
| Indians in Dublin, Ca | Facebook Link | Not Available |
| Asian Pacific Islander American Public Affairs | https://www.apapa.org | 916-928-9988<br>info@apapa.org |
| Integrity in Action | Dublin-integrity-in-action.org | info@dublinintegrityinaction.org |
| Chamber of Commerce | http://www.dublinchamberofcommerce.org | 925-828-6200, Inge Houston, CEO/President,<br>ceo@dublinchamberofcommerce.org |
| Innovation Tri-Valley | Not Available | Lynn Naylor, CEO,<br>lnaylor@innovationtrivalley.org |
| Dublin Senior Foundation | Not Available | 925-833-1866 |
| Dublin Community Foundation | http://www.dublinfoundation.org/v | 614-889-2001 |
| New Life Church | http://www.newlifeinfo.com | 925-355-9200 |
| Muslim Community Center | https://mcceastbay.org/ | 925-485-1786<br>contact@mcceastbay.org |
| Valley Christian Center | www.comediscovervcc.org | 925-560-6202 |

| Organization | Website | Number & Email |
|---|---|---|
| Blazing Fire Church | https://blazingfire.org/home | 925-264-9161<br>info@blazingfire.org |
| Dublin Art Collective | Facebook.com/DublinArtCa | https://dacarts.org/contact/ |
| Sri Panchamukha Hanuman Temple | https://panchamukhahanuman.org/ | 510-926-7638<br>pmhtemple@gmail.com |
| Dublin Fighting Irish | http://www.dublinfightingirish.org | 510-714-1439<br>irishyouthfootball@yahoo.com |
| Tri-Valley Convention and Visitor's Bureau | Not Available | 925-846-8910 |
| Tri-Valley YMCA | Not Available | 925-263-4444 |
| Women's Club of Dublin/San Ramon | https://dsrwomensclub.org/ | 925-828-0231<br>dsrwcmail@gmail.com |
| Dublin Sister City Association | Facebook Link | 925-899-4771 |
| Dublin Partners in Education | www.dpie.org | 925-828-2551 x8024 |
| Dublin Lions Club | Not Available | 925-828-6636<br>steve6gd@yahoo.com |
| Girl Scouts | https://www.crossroadsgirlscouts.com/ | 800-447-4475<br>crossroadsgirlscouts@gmail.com |
| Boy Scouts of America | http://www.sfbac.org/about/ebscoutshop | 925-785-4518<br>jalewis@bsamail.org |
| Dublin Historical Preservation Association | http://dhpa.org/ | dhpaorg@gmail.com |
| Dublin 4-H | https://www.dublin4h.com/ | 925-462-4518<br>cnattu@gmail.com<br>badami@gmail.com |
| Child Care Links | https://behively.org/ | 925-417-8733<br>hello@behively.org |
| BART | BART.gov | Kamala Parks, KParks2@bart.gov |
| Senior Support Programs of the Tri-Valley | Not Available | Not Available |
| Alameda County Safe Routes to School | http://alamedacountysr2s.org/ | info@alamedacountysr2s.org |

| Organization | Website | Number & Email |
|---|---|---|
| Kaiser Permanente | https://healthy.kaiserpermanente.org | Ronald Wetter, Community & Governmental Relations Manager, ronald.wetter@kp.org |
| Zeiss Meditec | www.zeiss.com | Mark Boyd, Sr. Facilities Manager, mar.boyd@zeiss.com |
| Vagaro HQ | www.vagaro.com | Kerry Melchoir, Director of Operations, kerrymelchior@vagaro.com |
| TriNet HQ | www.trinet.com | Jay Meyer, Director of Facilities, jay.meyer@trinet.com |
| Patelco Credit Union HQ | www.patelco.org | Cara Houck, Community and Corporate Social Responsibility Specialist, chouck@patelco.org |
| AEye HQ | www.aeye.ai | Jennifer Deitsch, Communications Director |
| Ross Stores HQ | https://corp.rossstores.com/contact-us-corp | Lynn Mayate, Corporate HR, lynn.mayate@ross.com |
| Graybar | www.graybar.com | Kristian Reyes, Kristian.Reyes@graybar.com |
| Chabot Las Positas Community College District | www.clpccd.org | Julia Dozier, District Executive Director, jdozier@clpccd.org |
| Dublin San Ramon Services District | www.DSRSD.com | Judy Zavadil, zavadil@dsrsd.com |
| Camp Parks | https://home.army.mil/parks/index.php | Brian Lucid, Analyst, brian.m.lucid.civ@mail.mil |
| Tri-Valley Career Center | https://www.trivalleycareercenter.org/ | Sarah Holtzclaw, Program Manager, sholtzclaw@clpccd.org |
| Federal Corrections Institute | https://www.bop.gov/locations/institutions/dub/ | DUB-ExecAssistant-S@bop.gov<br>925-833-7500 |
| Alameda County (Courthouse, Office of Emergency Services, County Jail) | https://www.alamedacountysheriff.org/Home/Components/FacilityDirectory/FacilityDirectory/56/33 | 925-803-7800 |

# APPENDIX B:
# COLLISION ANALYSIS MEMO

KITTELSON & ASSOCIATES
155 Grand Avenue, Suite 505
Oakland, CA 94612
P 510.839.1742

# Technical Memorandum

**October 11, 2022** Project# 26647

To: Sai Midididdi, TE; Pratyush Bhatia, PE, TE
City of Dublin

From: Kittelson & Associates, Inc.

RE: Dublin Local Roadway Safety Plan

# TASK 3.2 – COLLISION ANALYSIS MEMO

This memorandum summarizes five years of collision data (2016 – 2020) and trends within the City of Dublin (City) as part of the Dublin Local Roadway Safety Plan (LRSP). It is organized into the following sections:

1. Executive Summary
2. Citywide Collision Patterns and Trends
    - All Road Users
    - Pedestrians
    - Bicyclists
    - Comparison with Strategic Highway Safety Plan
    - Recommended Emphasis Areas
3. Network Screening Findings
4. Next Steps

The data used for this analysis were compiled from SWITRS and Crossroads databases as detailed in Attachment A.

# 1 EXECUTIVE SUMMARY

The following presents a summary of findings from this report. All findings are explained in further detail throughout the remainder of the report.

## 1.1 Collision Patterns and Trends

### 1.1.1 ALL ROAD USERS

Descriptive analysis of reported collisions found the following:

- 1,455 collisions were reported (291 per year average), including 18 fatal/severe injury collisions (3.6 per year average).
- Intersection collisions are more frequent than segment collisions, representing 82% of reported collisions and 74% of fatal/severe injury collisions.
- *Rear end*, *broadside*, and *hit object* collisions are the most frequent collision types. Among fatal/severe injury collisions, the two most common types are *vehicle/pedestrian* and *hit object* collisions. Therefore, those four collision types were the focus of detailed analysis.

- *Unsafe speed*, *improper turning*, and *automobile right of way*[1] are the most frequently reported primary collision factors, together accounting for 54% of all reported collisions. *Driving/bicycling under the influence of alcohol or drug*, *unsafe speed*, and *improper turning* together account for 50% of fatal/severe injury collisions.

## 1.1.2 BICYCLE AND PEDESTRIAN COLLISIONS

Descriptive analysis of bicycle- and pedestrian-involved collisions found the following:

- 53 collisions (4% of reported) involved pedestrians, including 5 fatal/severe injury collisions (28% of fatal/severe injury citywide).
  - 4 of the fatal/severe injury collisions occurred in *dark* or *dusk* conditions.
- 56 collisions (4% of reported) involved bicyclists, including 2 severe injury collisions (11% of fatal/severe injury citywide).

## 1.1.3 COMPARISONS TO STATEWIDE AVERAGES

- The City has at least a 10% higher share of fatal and severe injury collisions than the statewide levels[2] for the following challenge areas:
  - Aging driver collisions (22% compared to 12%)
  - Pedestrian collisions (28% compared to 17%)
  - Intersection collisions (72% compared to 23%)

## 1.1.4 EMPHASIS AREA RECOMMENDATIONS

- **Pedestrian collisions:** These collisions account for 28% of all fatal/severe injury collisions as compared to 17% of all statewide fatal/severe injury collisions. Pedestrian collisions occurred mostly at intersections.
- **Nighttime safety:** A disproportionate share of fatal/severe injury collisions, including pedestrian collisions, occur in dusk/dawn or dark conditions.
- **Aging drivers:** These collisions account for 22% of all fatal/severe injury collisions as compared to 12% of all statewide fatal/severe injury collisions.
- **Signalized local/arterial intersections:** These intersections constitute the plurality of *rear end* and *broadside* collisions. *Hit object* collisions, which are the most frequent fatal/severe injury collision types, also primarily occur at signalized intersections.
- **Driver behavior:** Including impaired driving and aggressive driving.
  - *Impaired Driving* account for over 25% of all fatal/severe injury collisions in Dublin.
  - *Aggressive Driving* accounts for over 15% of all fatal/severe injury collisions in Dublin.

[1] This is a reported primary collision factor that indicates one of several California Vehicle Violation codes indicating a failure to yield right-of-way to oncoming traffic. This is a reported PCF that indicated one of several California Vehicle Violation codes indicating a failure to yield right-of-way to conflicting traffic.

[2] California Strategic Highway Safety Plan 2020-2024: https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/shsp/2022-shsp-full-report-2020-2024-a11y.pdf

# 1.2 Network Screening Findings

- Intersection and roadway locations were evaluated based on five-year collision frequency and severity. A collision severity score was calculated and used to identify priority locations.
  - 15 priority intersections are identified.
  - 5 priority roadways are identified.

The identified priority locations based on collision severity score are presented in Table 1. The top scoring intersections and segments were reviewed to determine priority locations for safety improvements and upcoming HSIP applications. The final list of priority locations may change from the table below.

**Table 1. Priority Intersections and Roadways based on Collision Severity Score**

| # | Location | Location Type | Collision Severity Score | Total No. Collisions | Fatal / Severe Injury Collisions | Other Injury Collisions | PDO Collisions |
|---|---|---|---|---|---|---|---|
| ***Priority Intersections*** | | | | | | | |
| 1 | Arnold Rd & Dublin Blvd | Sig. Int. | 59.9 | 17 | 2 | 8 | 7 |
| 2 | Dublin Blvd & Village Pkwy | Sig. Int. | 49.4 | 43 | 1 | 15 | 27 |
| 3 | Donlon Way & Dublin Blvd | Unsig. Int. | 42.1 | 6 | 1 | 3 | 2 |
| 4 | Amador Valley Blvd & San Ramon Rd | Sig. Int. | 41.1 | 18 | 1 | 9 | 8 |
| 5 | Regional St & Regional Common | Unsig. Int. | 38.8 | 5 | 1 | 0 | 4 |
| 6 | Winding Trail Ln & Rolling Hills Dr | Unsig. Int. | 38.0 | 1 | 1 | 0 | 0 |
| 7 | Lucania St & Brighton Dr | Unsig. Int. | 38.0 | 1 | 1 | 0 | 0 |
| 8 | Tyne Ct & Penn Dr | Unsig. Int. | 38.0 | 1 | 1 | 0 | 0 |
| 9 | Dublin Blvd & Dougherty Rd | Sig. Int. | 37.2 | 65 | 0 | 22 | 43 |
| 10 | San Ramon Rd & Shannon Ave | Sig. Int. | 29.3 | 8 | 1 | 3 | 4 |
| 11 | Dublin Ct & Dublin Blvd | Sig. Int. | 27.3 | 13 | 1 | 1 | 11 |
| 12 | Dublin Blvd & Tassajara Rd | Sig. Int. | 25.8 | 34 | 0 | 16 | 18 |
| 13 | Grafton St & Central Pkwy | Sig. Int. | 24.3 | 3 | 1 | 0 | 2 |
| 14 | Bent Tree Dr & Fallon Rd | Sig. Int. | 23.9 | 1 | 1 | 0 | 0 |
| 15 | Martinelli Way & Hacienda Dr | Sig. Int. | 18.5 | 28 | 0 | 10 | 18 |
| ***Priority Roadways*** | | | | | | | |
| 1 | Dougherty Rd (north of Willow Creek Dr to south of 8th St) – *0.75 mi* | Arterial | 36.2 | 8 | 1 | 2 | 5 |
| 2 | Fallon Rd (Signal Hill Dr to Gleason Dr) – *0.75 mi* | Arterial | 35.5 | 4 | 1 | 1 | 2 |
| 3 | Village Pkwy (northern city limits to north of Tamarack Dr) – *0.69 mi* | Collector | 35.3 | 8 | 1 | 1 | 6 |
| 4 | Amador Valley Blvd (Burton St to Dougherty Rd) – *0.75 mi* | Arterial | 34.1 | 2 | 1 | 1 | 0 |

| # | Location | Location Type | Collision Severity Score | Total No. Collisions | Fatal / Severe Injury Collisions | Other Injury Collisions | PDO Collisions |
|---|---|---|---|---|---|---|---|
| 5 | Tassajara Rd (northern city limits to Fallon Rd) – *0.50 mi* | Arterial | 33.1 | 2 | 1 | 0 | 1 |

Note: Priority locations are based on collision severity scores and may change.

# 2 CITYWIDE COLLISION PATTERNS AND TRENDS

This section presents citywide collision patterns and trends. This analysis focuses on identifying behavioral and roadway patterns associated with injury and fatal collision outcomes. By analyzing reported collisions together, systemic trends and emphasis areas across locations can be identified. From these, countermeasures can be selected in subsequent project tasks. Analysis emphasis is given to fatal/severe injury collisions because these outcomes represent life-changing events. Preventing all collisions from occurring may not be a realistic goal, but an focus on safety should emphasize reducing the most severe outcomes that occur on roadways. Fatal and severe injury collisions are typically grouped together in this analysis because the difference between those outcomes is often a difference in emergency response time or the health conditions of the parties involved rather than the collision itself (the circumstances of such collisions are often similar and can therefore be analyzed together).

## 2.1 Collision Data

The database is comprised of the most recent five years of reported collisions available on the Statewide Integrated Traffic Records System (SWITRS) and the City's data in the Crossroads software, representing January 1, 2016, through December 31, 2020. These data sources were merged into a consolidated database that consists of 1,455 reported collisions. Methods and decisions relating to the merging of these databases are described in Attachment A.

Collision severity is coded according to the highest degree of injury experienced, and the data used for this analysis includes the following coded severity levels (listed in descending order):

- **Fatal:** death because of injuries sustained in the collision.
- **Severe Injury:** Injuries include, for example, broken bones, severe lacerations, or other injuries that go beyond the reporting officer's assessment of "other visible injuries."
- **Moderate Injury:** (Also referred to as *other visible injury*), an injury, other than those described above, that is evident to observers at the scene of the collision—for example, bruises or minor lacerations.
- **Minor Injury**: (Also referred to as *complaint of pain* or *suspected injury*). Internal or other non-visible injuries—for example, a person limps or seems incoherent.
- **Property damage only (PDO):** No injuries sustained

For simplicity in presentation, moderate injury and minor injury collisions are frequently collapsed into a single *other injury* category.

## 2.2 All Road Users

The findings in this section are organized as follows:

- Collision severity
- Collision location
- Collision type
- Primary collision factor
- Temporal trends
- Other factors

## 2.2.1 COLLISION SEVERITY

A total of reported 1,455 collisions are present in the compiled database. The collisions are from the period of January 1, 2016, through December 31, 2020.

A summary of collision severity and road user type is presented in Table 2. Pedestrians and bicyclists are each involved in 4% of reported collisions across all locations and severity levels but represent larger shares of injury and fatal collisions. Pedestrian and bicyclist trends are explored in more detail in subsequent sections.

**Table 2: Road Users Involved and Collision Severity, Dublin, 2016-2020**

| Road Users Involved | Number of Fatal Collisions | Number of Severe Injury Collisions | Number of Moderate Injury Collisions | Number of Minor Injury Collisions | Number of Property Damage Collisions | Total Reported Fatal / Severe Injury Collisions (% of Column) | Total Reported Collisions (% of Column) |
|---|---|---|---|---|---|---|---|
| Pedestrian Involved | 1 | 4 | 20 | 21 | 7 | **5 (28%)** | **53 (4%)** |
| Bicycle Involved | - | 2 | 24 | 22 | 8 | **2 (11%)** | **56 (4%)** |
| Motor Vehicle Only or Vehicle-Fixed Object | 1 | 10 | 111 | 293 | 932 | **11 (61%)** | **1,347 (92%)** |
| **Total Reported Collisions** | **2** | **16** | **155** | **336** | **947** | **18 (100%)** | **1,455 (100%)** |

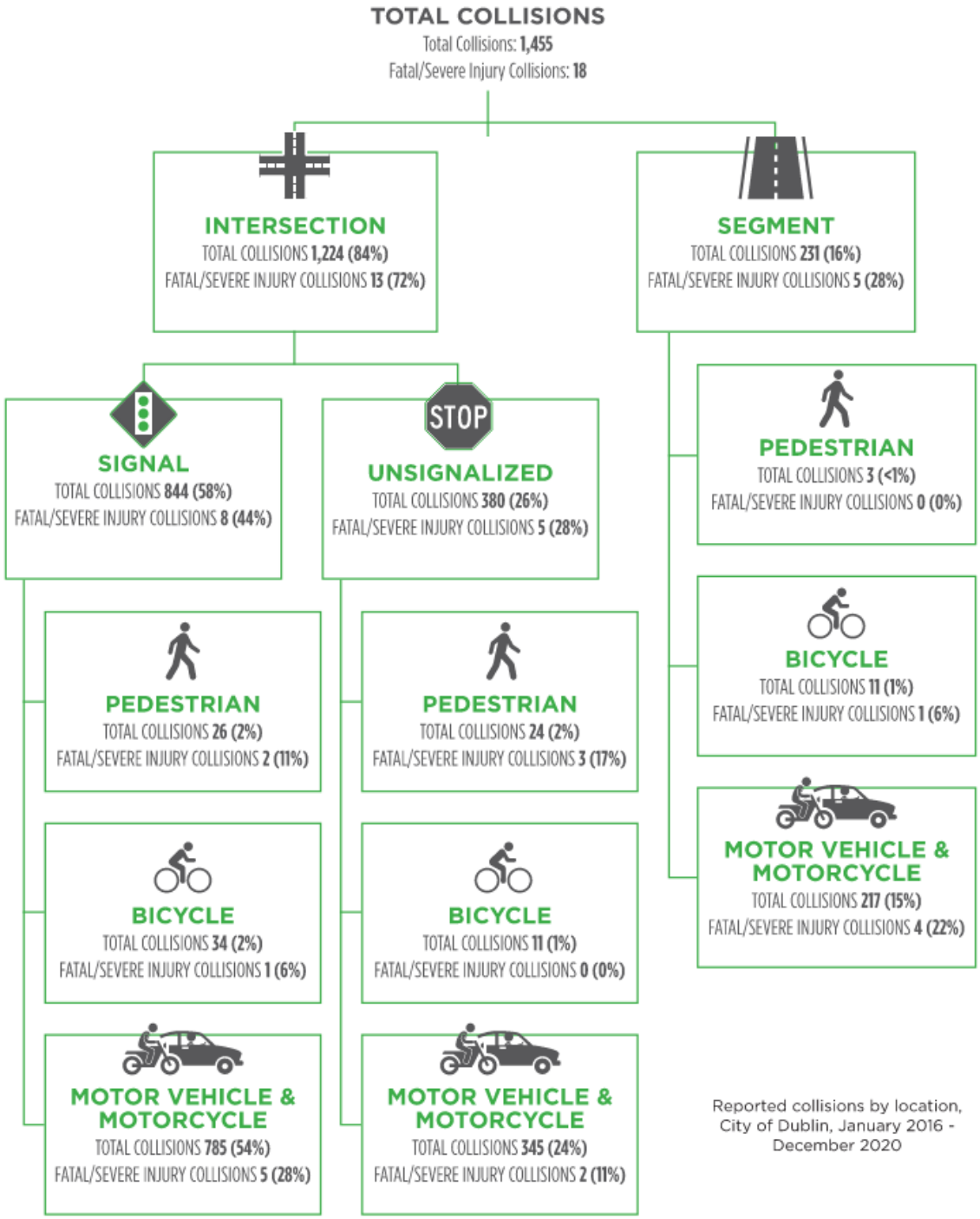
Source: SWITRS, 2021; City of Dublin, 2021.
Note: There is one crash that is coded as both a pedestrian and bicyclist involved collision. Therefore, total reported collisions will not add up to the pedestrian, bicyclist, and motor vehicle collisions.

## 2.2.2 COLLISION LOCATION

Reported collisions are broken down by location and further broken down into type of intersection control and pedestrian, bicycle, and motorcycle collisions (Figure 1). The following trends are present:

- Most collisions (84%) occur at intersections.
  - Signalized intersections represent most collisions (58%) and the plurality of fatal/severe injury collisions (44%).
  - Just over one third of fatal/severe injury collisions occur at an intersection and involve a pedestrian or bicyclist (34%).
- Segment collisions, when they occur, are more likely severe than intersection collisions (2% of segment collisions are fatal/severe injury, compared to 1% of intersection collisions).

**Figure 1: Reported Collisions by Location, Dublin, 2016-2020**

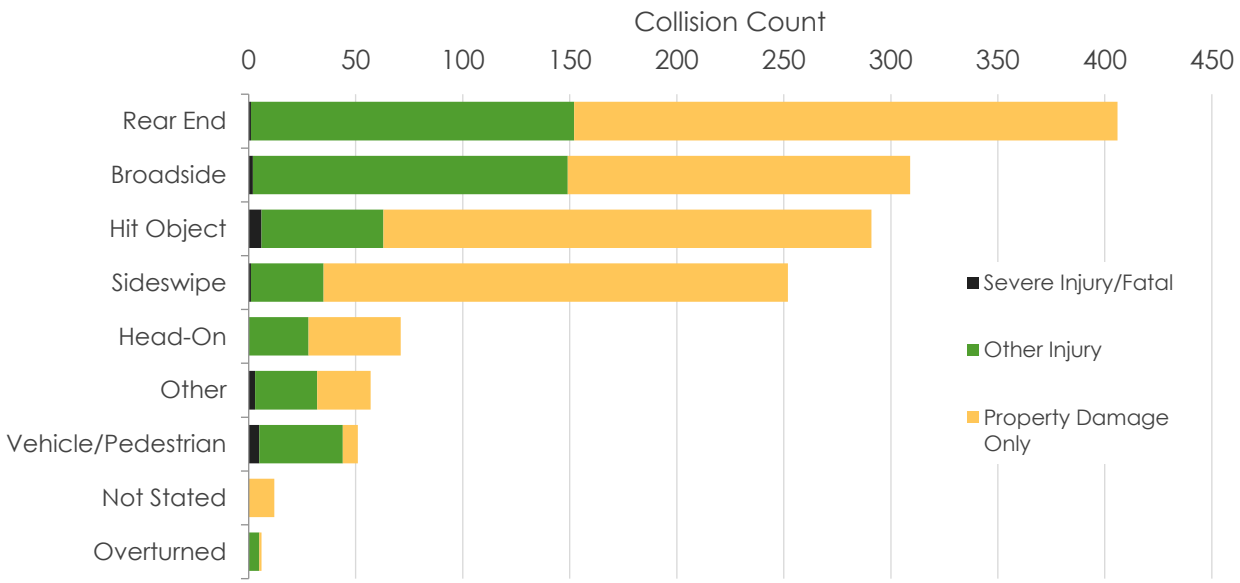


## 2.2.3 COLLISION TYPE

Reported collision types indicate the movements most frequently resulting in collisions and severe outcomes. Figure 2 presents the distribution of collision types and severity levels.

- The three most frequent collision types are *rear end*, *broadside*, and *hit object*. These three collision types account for 69% of all reported collisions.
- The three most frequent collision types resulting in fatal or severe injury are *vehicle/pedestrian*, *other*, and *hit object*. *Vehicle/pedestrian* and *hit object* collisions together account for 69% of fatal/severe injury collisions.
- These four collision types—*rear end, broadside, hit object*, and *vehicle/pedestrian*, are focus collision types for this analysis given that they represent a substantial portion of collisions, injuries, and roadway deaths in the City.

**Figure 2: Collisions by Type and Severity, Dublin, 2016-2020**



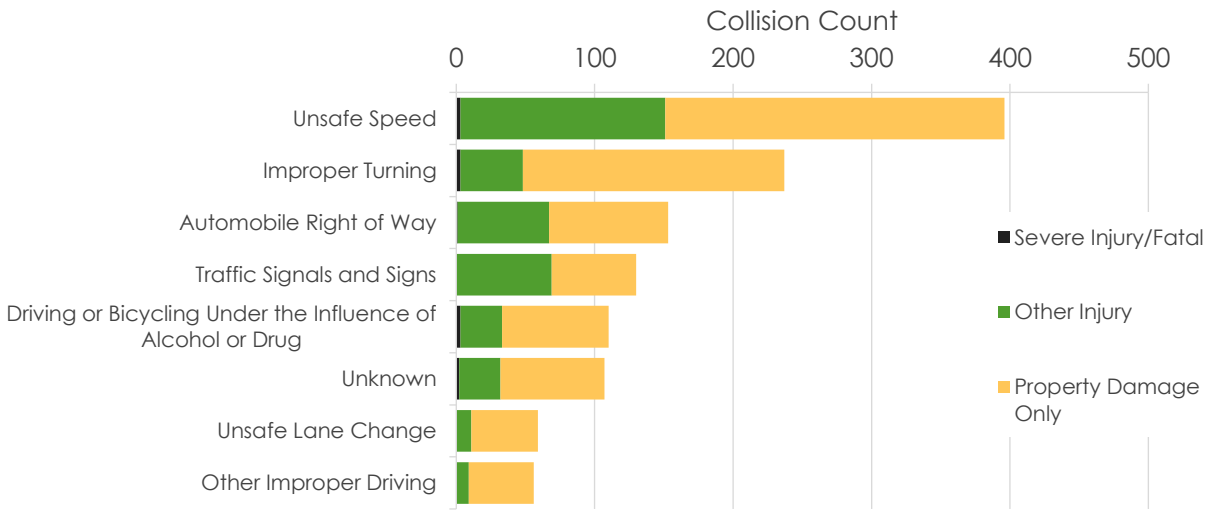

Source: SWITRS, 2021; City of Dublin, 2021.

## 2.2.4 PRIMARY COLLISION FACTOR

Reporting officers identify a primary collision factor (PCF) for each collision. There are a number of different PCFs from which an officer can select in filling out a report, corresponding to various California Vehicle Code (CVC) violations. It is up to the officer's judgment and information available at the scene for them to select the single factor they deem most relevant to the collision. Figure 3 presents collisions by reported PCF and severity.

- The three most frequent PCFs Citywide are *unsafe speed*, *improper turning*, and *automobile right of way*[3] . These three PCFs account for 54% of reported collisions.
- The most frequent PCFs that result in fatal or severe injury are *driving or bicycling under the influence of alcohol or drug*, *unsafe speed*, and *improper turning*. These three PCFs account for 50% of fatal/severe injury collisions.

**Figure 3: Collisions by PCF and Severity, Dublin, 2016-2020**




Source: SWITRS, 2021; City of Dublin, 2021.

### 2.2.4.1 Primary Collision Factor and Collision Type

For the focus collision types listed in the previous section – *rear end*, *broadside*, *hit object*, and *vehicle/pedestrian*—associated PCFs are further analyzed. Table 3 presents this cross tabulation. The table shows:

- *Rear end* collisions are most frequently associated with *unsafe speed* (72% of collisions).
- *Broadside* collisions are associated most frequently with *automobile right of way*[4] or *traffic signals and signs*[5] (32% and 33% respectively). These are likely associated with driveway access or intersections and are explored in more detail later.
- 68% of *hit object* collisions are caused by three PCFs: *improper turning*, *unsafe speed*, and *driving/bicycling under the influence*.
- 51% of *vehicle/pedestrian* collisions are attributed to either a pedestrian or a driver violation the other's right of way. More detailed trends are explored in Section 2.3.

[3] This is a reported PCF that indicates one of several California Vehicle Violation codes indicating a failure to yield right-of-way to oncoming traffic. This is a reported PCF that indicated one of several California Vehicle Violation codes indicating a failure to yield right-of-way to conflicting traffic.

[4] This is a reported primary collision factor that indicates one of several California Vehicle Violation codes indicating a failure to yield right-of-way to conflicting traffic.

[5] This is a reported PCF that indicated one of several California Vehicle Violation codes indicating a failure to adhere to traffic control (e.g. running a stop sign or red signal indication).

- Three fatal or severe injury collisions involving bicyclists are recorded as *other* collision types. Bicyclist-involved collisions are analyzed and discussed in Section 2.4.

**Table 3: Collision Type by PCF (PCFs Sum to 100%), Dublin, 2016 - 2020**

| Primary Collision Factor | Collision Type | | | | |
|---|---|---|---|---|---|
| | Rear End (% of Column) | Broadside (% of Column) | Hit Object (% of Column) | Vehicle / Pedestrian (% of Column) | Other (% of Column) |
| Automobile Right of Way | 1% | 32% | 0% | 2% | 19% |
| Driving or Bicycling Under the Influence of Alcohol or Drug | 7% | 2% | 15% | 0% | 2% |
| Improper Turning | 5% | 9% | 30% | 0% | 7% |
| Other Improper Driving | 1% | 1% | 7% | 10% | 7% |
| Other Than Driver (or Pedestrian) | 1% | 1% | 7% | 0% | 7% |
| Pedestrian Right of Way | 0% | 1% | 0% | 29% | 4% |
| Pedestrian Violation | 0% | 0% | 0% | 22% | 0% |
| Traffic Signals and Signs | 0% | 33% | 1% | 2% | 4% |
| Unknown | 3% | 9% | 6% | 14% | 14% |
| Unsafe Speed | 72% | 2% | 23% | 6% | 11% |
| Unsafe Starting or Backing | 7% | 3% | 1% | 6% | 11% |
| Wrong Side of Road | 0% | 2% | 2% | 0% | 11% |
| *Other PCFs* | *3%* | *5%* | *8%* | 9% | *3%* |
| **Total Reported Collisions** | **406 (100%)** | **309 (100%)** | **291 (100%)** | **51 (100%)** | **57 (100%)** |

Source: SWITRS, 2021; City of Dublin, 2021.

Notes: The three highest PCFs for each collision type are highlighted in red. If there is a tie for the third highest, all tied PCFs are highlighted. Only focus collision types are shown and totaled in this table (three most frequent or three most frequent among fatal/severe injury). PCFs with less than 6% share across listed collision types are grouped into the "*Other PCFs*" category to improve legibility. Totals may not sum to 100% due to rounding.

### 2.2.4.2 Primary Collision Factor and Roadway Characteristics

The previous sections established focus collision types and their most frequent PCFs citywide. This section analyzes the frequency of location types for each collision type and PCF combination to provide greater detail on potential emphasis areas for the City. Location characteristics are further analyzed using intersection type and roadway functional class.

The following were analyzed:

- ***Rear end* collisions at intersections:** 28% of citywide collisions are *rear end,* the most frequent collision type (Table 4). 84% of *rear end* collisions occurred at an intersection.
- ***Broadside* collisions at intersections:** 21% of citywide collisions are *broadside,* the second most frequent collision type (Table 5). 84% of *broadside* collisions occurred at an intersection.
- ***Hit Object* collisions at intersections:** 33% of fatal/severe injury collisions are *hit object*, the most frequent collision type among fatal/severe injury (Table 6). 76% of *hit object* collisions occurred at an intersection.

- ***Vehicle/pedestrian*** collisions were the second most frequent collision type among fatal/severe injury collisions and are analyzed in detail in Section 2.3.

*Rear end* collisions are analyzed by intersection type and PCFs in Table 4. *Rear end* collisions at intersections most frequently occur at signals (74% of collisions) and with a reported PCF of *unsafe speed* (75%).

- Among *rear end* collisions at intersections, 137 (46%) occur at signalized intersections of arterials with locals/collectors and 81 (27%) occur at signalized arterial/arterial intersections.
- Most of these collisions have a reported PCF of *unsafe speed*.

**Table 4: Rear End Collisions by Intersection Type, Intersecting Functional Class, and PCF, Dublin, 2016-2020**

| Intersection Type | Signalized | | | Unsignalized | | | Total |
|---|---|---|---|---|---|---|---|
| Intersecting Functional Class | Arterial + Arterial | Arterial + Local/Collector | Local/Collector + Local/Collector | Arterial + Arterial | Arterial + Local/Collector | Local/Collector + Local/Collector | |
| Driving or Bicycling Under the Influence of Alcohol or Drug | 5 | 12 | 0 | 1 | 2 | 7 | 27 |
| Improper Turning | 2 | 2 | 1 | 0 | 2 | 10 | 17 |
| Unsafe Speed | 62 | 112 | 3 | 3 | 25 | 23 | 228 |
| Unsafe Starting or Backing | 12 | 11 | 0 | 1 | 0 | 2 | 26 |
| **Total** | **81** | **137** | **4** | **5** | **29** | **42** | **298** |

Source: SWITRS, 2021; City of Dublin, 2021.

Notes: Local roads were taken to include collector and residential roads. Collisions with an unknown intersecting functional class were omitted from this table (4 collisions). Collisions at an intersection with a freeway ramp were omitted from this table (4 collisions).

*Broadside* collisions are analyzed by intersection type and PCFs in Table 5. *Broadside* collisions at intersections most frequently occur at signals (79%) and with a reported PCF of *traffic signals and signs.*[6] Among *broadside* collisions at intersections, 126 (54%) occur at local/arterial signalized intersections.

**Table 5: Broadside Collisions by Intersection Type, Intersecting Functional Class, and PCF, Dublin, 2016-2020**

| Intersection Type | Signalized | | | Unsignalized | | | Total |
|---|---|---|---|---|---|---|---|
| Intersecting Functional Class | Arterial + Arterial | Local + Arterial | Local + Local | Arterial + Arterial | Local + Arterial | Local + Local | |
| Automobile Right of Way[7] | 13 | 30 | 1 | 0 | 17 | 17 | 78 |
| Improper Turning | 6 | 10 | 1 | 0 | 3 | 5 | 25 |
| Traffic Signals and Signs[8] | 23 | 72 | 3 | 0 | 2 | 2 | 102 |
| Unknown | 11 | 14 | 0 | 0 | 1 | 2 | 28 |
| **Total** | **53** | **126** | **5** | **0** | **23** | **26** | **233** |

Source: SWITRS, 2021; City of Dublin, 2021.

Notes: Local roads were taken to include collector and residential roads. Collisions with an unknown intersecting functional class were omitted from this table (4 collisions). Collisions at an intersection with a freeway ramp were omitted from this table (4 collisions).

[6] This is a reported PCF that indicated one of several California Vehicle Violation codes indicating a failure to adhere to traffic control (e.g. running a stop sign or red signal indication).

[7] This is a reported primary collision factor that indicates one of several California Vehicle Violation codes indicating a failure to yield right-of-way to conflicting traffic.

[8] This is a reported PCF that indicated one of several California Vehicle Violation codes indicating a failure to adhere to traffic control (e.g. running a stop sign or red signal indication).

*Hit object* collisions *are analyzed by intersection type and PCFs in* Table 6. *Hit object* collisions at intersections most frequently occur at signals (107 of 171 collisions, or 63%) and with a reported PCF of *improper turning*. Among *hit object* collisions at intersections, the most frequently occurring location and PCF combinations are *improper turning* at arterial/local signalized intersections (21%).

**Table 6: Hit Object Collisions by Intersection Type, Intersecting Functional Class, and PCF, Dublin, 2016-2020**

| Intersection Type | Signalized | | | Unsignalized | | | Total |
|---|---|---|---|---|---|---|---|
| Intersecting Functional Class | Arterial + Arterial | Local + Arterial | Local + Local | Arterial + Arterial | Local + Arterial | Local + Local | |
| Driving or Bicycling Under the Influence of Alcohol or Drug | 8 | 16 | 3 | 1 | 1 | 8 | 37 |
| Improper Turning | 7 | 36 | 3 | 1 | 3 | 22 | 72 |
| Other Improper Driving | 0 | 3 | 0 | 0 | 0 | 11 | 14 |
| Unsafe Speed | 7 | 22 | 2 | 1 | 4 | 12 | 48 |
| **Total** | **22** | **77** | **8** | **3** | **8** | **53** | **171** |

Source: SWITRS, 2021; City of Dublin, 2021.

Notes: Local roads were taken to include collector and residential roads. Collisions with an intersecting with a freeway ramp were omitted from this table (2 collisions).

## 2.2.5 TEMPORAL TRENDS

### 2.2.5.1 Year-Over-Year

On average, there are 291 reported collisions per year and 3.6 reported fatal/severe injury collisions per year between 2016 and 2020. Total reported collisions increase year-over-year from 2016 to 2019. In 2020, collisions dropped below previous years (Table 7). This trend holds true for other injury and PDO collisions, but severe injury collisions have the greatest number of collisions in 2020 while total collisions drop significantly.

Single-year trends are not necessarily indicative of improved or decreased safety performance given and may be sensitive to random fluctuations. Collision totals for 2020 may be provisional, given that the California Highway Patrol-maintained SWITRS database is updated over time and collision data can take over a year to process and include. Further, cities in the United States experienced a decrease in traffic volumes in 2020 due to the COVID-19 pandemic but an increase in traffic fatalities.[9] While 2020 totals appear lower than previous years, its data should not be directly compared or used in isolation as indication of roadway safety performance.

[9] https://www.nhtsa.gov/press-releases/2020-fatality-data-show-increased-traffic-fatalities-during-pandemic

**Table 7: Collisions by Year, Dublin, 2016-2020**

| Year | Collision Count | Fatal | Severe Injury | Other Injury | PDO |
|---|---|---|---|---|---|
| 2016 | 288 | 1 | 4 | 104 | 179 |
| 2017 | 294 | 0 | 2 | 101 | 191 |
| 2018 | 323 | 0 | 4 | 108 | 211 |
| 2019 | 346 | 1 | 1 | 125 | 219 |
| 2020 | 204 | 0 | 5 | 52 | 147 |
| **Total** | **1,455** | **2** | **16** | **490** | **947** |

Source: SWITRS, 2021; City of Dublin, 2021.

### 2.2.5.2 Time-of-Day and Day-of-Week

Collisions are further analyzed by time-of-day and day-of-week.

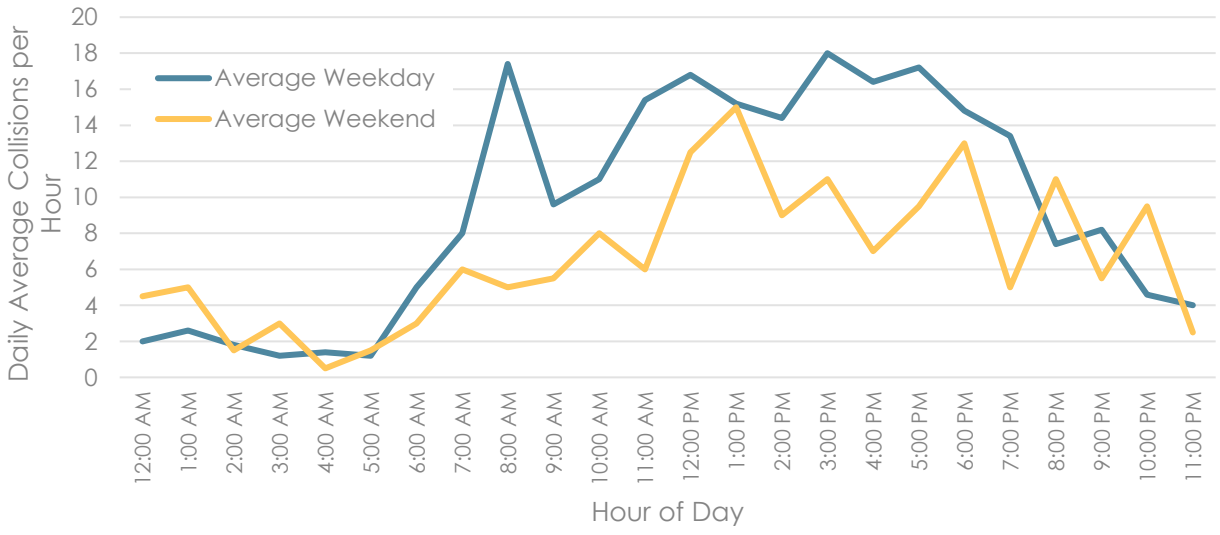
- The highest concentration of collisions occurs between Tuesday and Friday between 8 am and 6 pm (Table 8).
- One half of all fatal and severe injuries (9) occur between 8 pm and 2 am (Table 9).
- Trends are similar on weekdays and weekends but AM, midday, PM peaks are more noticeable on weekdays than weekends (Figure 4).

**Table 8: Collisions by Time-of-Day and Day-of-Week, Dublin, 2016-2020**

| Hour of Day | Sun | Mon | Tues | Weds | Thurs | Fri | Sat |
|---|---|---|---|---|---|---|---|
| 12:00 AM – 12:59 AM | 5 | 1 | 1 | 3 | 1 | 4 | 4 |
| 1:00 AM – 1:59 AM | 4 | 2 | 2 | 3 | 4 | 2 | 6 |
| 2:00 AM – 2:59 AM | 1 | 3 | | 1 | 3 | 2 | 2 |
| 3:00 AM – 3:59 AM | 2 | 1 | 1 | 1 | 1 | 2 | 4 |
| 4:00 AM – 4:59 AM | 1 | 1 | 1 | 1 | 3 | 1 | |
| 5:00 AM – 5:59 AM | 1 | 1 | | 1 | 1 | 3 | 2 |
| 6:00 AM – 6:59 AM | 1 | 7 | 4 | 4 | 6 | 4 | 5 |
| 7:00 AM – 7:59 AM | 7 | 12 | 6 | 5 | 9 | 8 | 5 |
| 8:00 AM – 8:59 AM | 7 | 8 | 16 | 27 | 15 | 21 | 3 |
| 9:00 AM – 9:59 AM | 7 | 10 | 11 | 13 | 10 | 4 | 4 |
| 10:00 AM – 10:59 AM | 5 | 11 | 8 | 10 | 15 | 11 | 11 |
| 11:00 AM – 11:59 AM | 4 | 15 | 10 | 17 | 12 | 23 | 8 |
| 12:00 PM – 12:59 PM | 12 | 16 | 18 | 22 | 13 | 15 | 13 |
| 1:00 PM – 1:59 PM | 14 | 11 | 19 | 10 | 18 | 18 | 16 |
| 2:00 PM – 2:59 PM | 8 | 11 | 14 | 17 | 15 | 15 | 10 |
| 3:00 PM – 3:59 PM | 11 | 14 | 17 | 20 | 19 | 20 | 11 |
| 4:00 PM – 4:59 PM | 5 | 9 | 17 | 24 | 15 | 17 | 9 |
| 5:00 PM – 5:59 PM | 12 | 17 | 15 | 12 | 23 | 19 | 7 |
| 6:00 PM – 6:59 PM | 13 | 12 | 27 | 14 | 7 | 14 | 13 |
| 7:00 PM – 7:59 PM | 3 | 12 | 16 | 12 | 12 | 15 | 7 |
| 8:00 PM – 8:59 PM | 12 | 4 | 10 | 7 | 6 | 10 | 10 |
| 9:00 PM – 9:59 PM | 4 | 8 | 10 | 7 | 7 | 9 | 7 |
| 10:00 PM – 10:59 PM | 13 | 3 | 1 | 8 | 6 | 5 | 6 |
| 11:00 PM – 11:59 PM | 2 | | 6 | 4 | 3 | 7 | 3 |

Source: SWITRS, 2021; City of Dublin, 2021.

**Figure 4: Hourly Collisions by Weekday/Weekend, Dublin, 2016-2020**




Source: SWITRS, 2021; City of Dublin, 2021.

**Table 9: Fatal/Severe Injury Collisions by Time-of-Day and Day-of-Week, Dublin, 2016-2020**

| Hour of Day | Sun | Mon | Tues | Weds | Thurs | Fri | Sat |
|---|---|---|---|---|---|---|---|
| 12:00 AM – 12:59 AM | | 1 | | | | | |
| 1:00 AM – 1:59 AM | 2 | | | | 2 | | |
| 2:00 AM – 2:59 AM | | | | | | | |
| 3:00 AM – 3:59 AM | | | | | | | |
| 4:00 AM – 4:59 AM | | | | | | | |
| 5:00 AM – 5:59 AM | | | | | | | |
| 6:00 AM – 6:59 AM | | | | | | | |
| 7:00 AM – 7:59 AM | | | | 1 | | | |
| 8:00 AM – 8:59 AM | | | | 1 | | | |
| 9:00 AM – 9:59 AM | | | | | | | |
| 10:00 AM – 10:59 AM | | | | | | | |
| 11:00 AM – 11:59 AM | | | | | | | 1 |
| 12:00 PM – 12:59 PM | | 1 | 1 | | | | |
| 1:00 PM – 1:59 PM | | | | | 1 | | |
| 2:00 PM – 2:59 PM | | | | | | | |
| 3:00 PM – 3:59 PM | | | | | | 1 | 1 |
| 4:00 PM – 4:59 PM | | | | | | | |
| 5:00 PM – 5:59 PM | | | | | | | |
| 6:00 PM – 6:59 PM | | | | 1 | | | |
| 7:00 PM – 7:59 PM | | | | | | | |
| 8:00 PM – 8:59 PM | | | | | | | 1 |
| 9:00 PM – 9:59 PM | | | 1 | | | | 1 |
| 10:00 PM – 10:59 PM | | 1 | | | | | |
| 11:00 PM – 11:59 PM | | | | | | | |

Source: SWITRS, 2021; City of Dublin, 2021.

## 2.2.6 OTHER FACTORS

Along with driver contributing factors, collisions can also be related to environmental and behavioral factors that are present. Data allow us to examine trends relating to these factors, which include lighting, weather, road surface conditions and alcohol/drug involvement.

#### 2.2.6.1 Lighting

Most collisions occur in *daylight* conditions (Table 10). For collisions that result in a fatality or severe collision, over half of the collisions occur during *dark* or *dusk* conditions.

**Table 10: Collisions by Lighting, Dublin, 2016-2020**

| Lighting | Collision Count | Collision Share | Severe/Fatal Collision Count | Severe/Fatal Collision Share |
|---|---|---|---|---|
| Daylight | 1,027 | 71% | 8 | 44% |
| Dark – Street Lights | 326 | 22% | 7 | 39% |
| Dusk – Dawn | 60 | 4% | 2 | 11% |
| Dark – No Street Lights | 25 | 2% | 0 | 0% |
| Not Stated | 15 | 1% | 0 | 0% |
| Dark – Street Lights Not Functioning | 2 | 0% | 1 | 6% |
| **Total** | **1,455** | **100%** | **18** | **100%** |

Source: SWITRS, 2021; City of Dublin, 2021.

#### 2.2.6.2 Other

The following factors are also analyzed to determine relationship between the factors and the severity of collisions.

- **Weather**: No disproportionate relationship is found between all collisions and fatal/severe injury collisions by weather condition. 85% of collisions and 83% of fatal/severe injury collisions occur in *clear* conditions.
- **Road Surface**: No disproportionate relationship is found between all severities and fatal/severe injury collisions by road surface condition. 91% of collisions and 100% of fatal/severe injury collisions occur on *dry* road surfaces.
- **Alcohol/Drug Involvement**: Analysis shows a disproportionate relationship between all severities and fatal/severe injury collisions by alcohol/drug involvement. 10% of collisions and 19% of fatal/severe injuries involve alcohol/drugs.

## 2.3 Pedestrians

Of the 1,455 total reported collisions, there are 53 that involved pedestrians. Of these collisions, five (9%) result in a fatality or severe injury. Trends in pedestrian collisions are analyzed and discussed below, including:

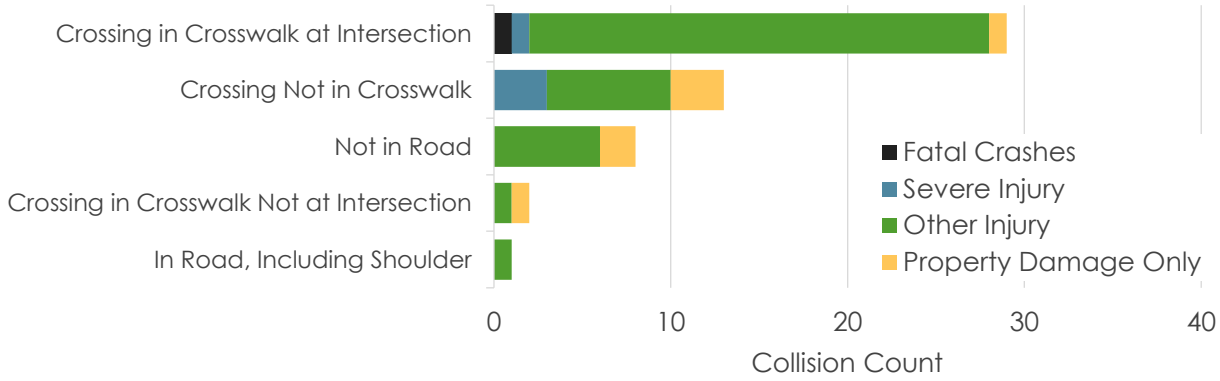
- Pedestrian action and location
- Time-of-day and day-of-week
- Lighting

## 2.3.1 PEDESTRIAN ACTION AND LOCATION

California collision data include *vehicle/pedestrian* collisions as a separate collision type. Therefore, we can use the supporting *pedestrian action* variable in the data to obtain the officer's assessment of where the collision occurred and what the pedestrian was doing before the collision (Figure 5).

- 50 *vehicle/pedestrian* collisions were within 250 feet of an intersection.
- 3 *vehicle/pedestrian* collisions occurred along a roadway segment.
- The most frequent pedestrian action was *crossing in crosswalk at intersection* (55% of pedestrian collisions).

**Figure 5: Pedestrian Collisions by Pedestrian Action**




Source: SWITRS, 2021; City of Dublin, 2021.

To better understand the nature of pedestrian-vehicle interactions, pedestrian collisions at intersections are isolated and analyzed by driver and PCF. There are 36 reported pedestrian collisions resulting injury (minor, moderate, or severe) or death that occur at an intersection. Table 11 breaks down pedestrian intersection collisions by control type, driver action, and cited PCF. The table indicates a somewhat even distribution of driver movements. The most frequently cited PCFs at signalized intersections indicate the presence of turning right-of-way conflicts at signalized intersections.

The following PCFs are most frequent:

- *Pedestrian right of way*: This PCF indicates that the pedestrian had the right-of-way.
- *Pedestrian violation*: This PCF indicates that the pedestrian violated the CVC.

**Table 11: Injury and Fatal Pedestrian Collisions at Intersections: Location, Driver Movements, and PCF, Dublin, 2016-2020**

| PCF | Driver Movement Preceding Collision | | | Total |
|---|---|---|---|---|
| | Proceeding Straight | Making Right Turn | Making Left Turn | |
| ***Signalized Intersections*** | | | | |
| Pedestrian Right of Way | 2 | 5 | 5 | 12 |
| Pedestrian Violation | 3 | 2 | 1 | 6 |
| Traffic Signals and Signs | 1 | | | 1 |
| Other Improper Driving | | | 1 | 1 |
| Improper Passing | | 1 | | 1 |
| **Signalized Total** | **6** | **8** | **7** | **21** |
| ***Unsignalized Intersections*** | | | | |
| Unsafe speed | 3 | | | 3 |
| Unknown | 2 | | 1 | 3 |
| Pedestrian violation | 3 | | | 3 |
| Pedestrian right of way | | 1 | 2 | 3 |
| Not Stated | 1 | 1 | | 2 |
| Improper turning | | 1 | | 1 |
| **Unsignalized Total** | **9** | **3** | **3** | **15** |
| **Total** | **15** | **11** | **10** | **36** |

Source: SWITRS, 2021; City of Dublin, 2021.

Note: Driver movements (i.e., *backing, entering traffic, slowing/stopping, stopped in road, other*) associated with three or fewer total collisions are excluded from this table for legibility.

## 2.3.2 TIME-OF-DAY AND DAY-OF-WEEK

Collisions involving pedestrians are distributed throughout the week with concentrations during the morning and evening peak travel periods (Table 12). Fatal and severe injury collisions are distributed throughout the day, with 3 of the 5 collisions occurring between 6:00 PM and 2:00 AM.

**Table 12: Pedestrian Collisions by Time-of-Day and Day-of-Week, Dublin, 2016-2020**

| | Sun | Mon | Tues | Weds | Thurs | Fri | Sat |
|---|---|---|---|---|---|---|---|
| 12:00 AM – 12:59 AM | | | | | | | 1 |
| 1:00 AM – 1:59 AM | | | | | | | 1 |
| 2:00 AM – 2:59 AM | | | | | | | |
| 3:00 AM – 3:59 AM | | | | | | | |
| 4:00 AM – 4:59 AM | | | | | | | |
| 5:00 AM – 5:59 AM | | | | | | | |
| 6:00 AM – 6:59 AM | | | 1 | | | | |
| 7:00 AM – 7:59 AM | | | | 1 | | 1 | |
| 8:00 AM – 8:59 AM | 2 | 3 | 2 | | | 2 | |
| 9:00 AM – 9:59 AM | | | | 1 | | 2 | |
| 10:00 AM – 10:59 AM | 1 | | | | 2 | | |
| 11:00 AM – 11:59 AM | | | 1 | | | 1 | |
| 12:00 PM – 12:59 PM | | | | | | | 1 |
| 1:00 PM – 1:59 PM | | | | 1 | | | |
| 2:00 PM – 2:59 PM | | 1 | 1 | 1 | 1 | | |
| 3:00 PM – 3:59 PM | | 1 | | | | 1 | |
| 4:00 PM – 4:59 PM | | | 2 | | | 1 | |
| 5:00 PM – 5:59 PM | | 1 | 2 | | 1 | | |
| 6:00 PM – 6:59 PM | | | | | | | |
| 7:00 PM – 7:59 PM | | | 1 | 2 | | | |
| 8:00 PM – 8:59 PM | | | 1 | 1 | | | 1 |
| 9:00 PM – 9:59 PM | | | | 1 | 1 | | 2 |
| 10:00 PM – 10:59 PM | | 1 | | | | | 1 |
| 11:00 PM – 11:59 PM | | | | 1 | | | 1 |

Source: SWITRS, 2021; City of Dublin, 2021.

## 2.3.3 LIGHTING

Most pedestrian collisions occur during *daylight* conditions. However, most pedestrian collisions that result in fatality or severe injury, however, occur during *dark* or *dusk-dawn* conditions (Table 13). Collision shares should be interpreted with caution for fatal and severe injuries given that there are five reported fatal/severe injury pedestrian collisions.

**Table 13: Pedestrian Collisions by Lighting, Dublin, 2016-2020**

| Lighting | Collision Count | Collision Share | Severe/Fatal Collision Count | Severe/Fatal Collision Share |
|---|---|---|---|---|
| Daylight | 37 | 70% | 1 | 20% |
| Dark - Street Lights | 8 | 15% | 1 | 20% |
| Dusk - Dawn | 6 | 11% | 2 | 40% |
| Dark - No Street Lights | 1 | 2% | 0 | 0% |
| Dark - Street Lights Not Functioning | 1 | 2% | 1 | 20% |

Source: SWITRS, 2021; City of Dublin, 2021.

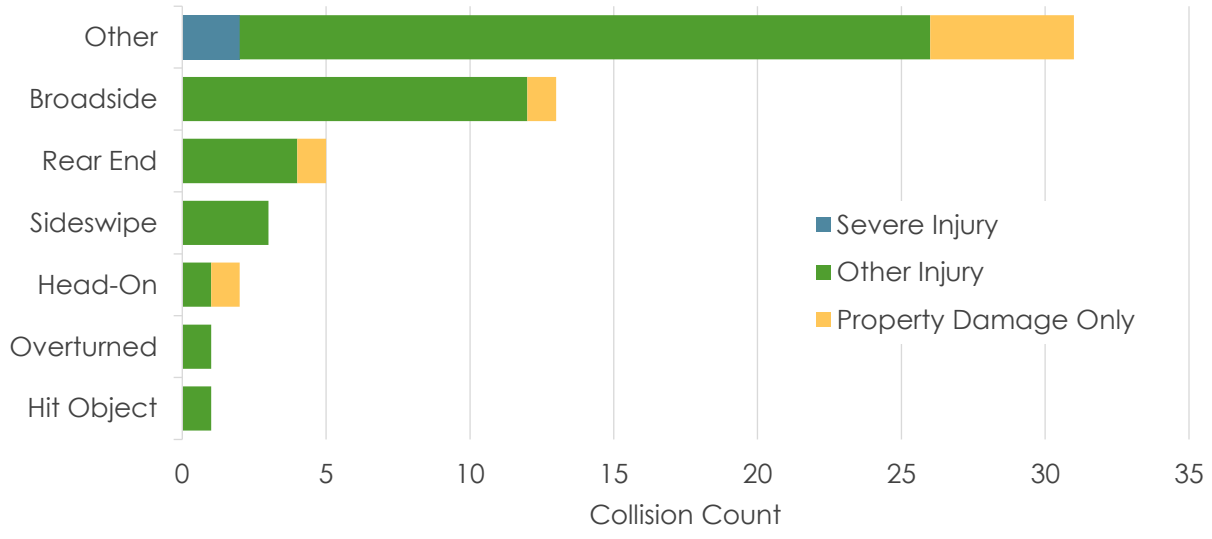
# 2.4 Bicyclists

Of the 1,455 total reported collisions, there are 56 that involved bicyclists. 2 of these (4%) result in severe injury. No fatal collisions involving a bicyclist are reported.

## 2.4.1 COLLISION TYPE AND SEVERITY

Most bicyclist collisions are categorized by collision type as *other* (55%). This is common for bicycle collisions because there is not a specific bicycle-related collision type for an officer to select. The next biggest share of collisions is categorized as *broadside* (23%) (Figure 6).

**Figure 6: Bicyclist Collisions by Type and Severity, Dublin, 2016-2020**




Source: SWITRS, 2021; City of Dublin, 2021.

## 2.4.2 TIME-OF-DAY AND DAY-OF-WEEK

Collisions involving bicyclists are distributed throughout the week and throughout the day (Table 14).

**Table 14: Bicyclist Collisions by Time-of-Day and Day-of-Week, Dublin, 2016-2020**

| | Sun | Mon | Tues | Weds | Thurs | Fri | Sat |
|---|---|---|---|---|---|---|---|
| 12:00 AM – 12:59 AM | | | | | | | |
| 1:00 AM – 1:59 AM | | | | | | | |
| 2:00 AM – 2:59 AM | | | 1 | | | | |
| 3:00 AM – 3:59 AM | | | | | | | |
| 4:00 AM – 4:59 AM | | | | | | | |
| 5:00 AM – 5:59 AM | | | | | | | |
| 6:00 AM – 6:59 AM | | | 1 | 2 | | | |
| 7:00 AM – 7:59 AM | | 3 | | 1 | 1 | | |
| 8:00 AM – 8:59 AM | | | | 1 | 1 | | 2 |
| 9:00 AM – 9:59 AM | | | 1 | 1 | 1 | | |
| 10:00 AM – 10:59 AM | 3 | | | | 1 | | 1 |
| 11:00 AM – 11:59 AM | 2 | | | 2 | | 1 | |
| 12:00 PM – 12:59 PM | | | | 1 | | | |
| 1:00 PM – 1:59 PM | | 1 | | 1 | | | |
| 2:00 PM – 2:59 PM | | 1 | | | | 1 | |
| 3:00 PM – 3:59 PM | | | 1 | 2 | 1 | | |
| 4:00 PM – 4:59 PM | | | 1 | 2 | 1 | | 1 |
| 5:00 PM – 5:59 PM | | | | | | 2 | |
| 6:00 PM – 6:59 PM | 1 | | 1 | | 1 | | |
| 7:00 PM – 7:59 PM | | 1 | 2 | 1 | 1 | | |
| 8:00 PM – 8:59 PM | | | | 2 | 2 | | |
| 9:00 PM – 9:59 PM | | | | | | | |
| 10:00 PM – 10:59 PM | | | | | | | |
| 11:00 PM – 11:59 PM | | | | | | | |

Source: SWITRS, 2021; City of Dublin, 2021.

## 2.4.3 LIGHTING

Most collisions involving bicyclists happen during daylight conditions. Both bicyclist collisions that result in severe injury occurred during daylight conditions (Table 15).

**Table 15: Bicyclist Collisions by Lighting, Dublin, 2016-2020**

| Lighting | Collision Count | Collision Share | Severe/Fatal Collision Count | Severe/Fatal Collision Share |
|---|---|---|---|---|
| Daylight | 42 | 75% | 2 | 100% |
| Dark - Street Lights | 8 | 14% | 0 | 0% |
| Dusk - Dawn | 5 | 9% | 0 | 0% |
| Dark - No Street Lights | 1 | 2% | 0 | 0% |

Source: SWITRS, 2021; City of Dublin, 2021.

## 2.5 Comparison with Strategic Highway Safety Plan

The California 2020-2024 Strategic Highway Safety Plan is a statewide traffic safety plan that provides guidance to influence development of statewide goals, strategies, and performance measures for local agencies and stakeholders statewide.

The SHSP focuses on 16 challenges areas (the 10 bolded challenge areas are subsequently compared to Dublin collision history). The remaining are not compared because the data available for this project do not readily and reliably provide for these :

- **Aging Drivers (≥65 years old)**
- **Bicyclists**
- **Commercial Vehicles**
- Distracted Driving
- Driver Licensing
- Emergency Response
- Emerging Technologies
- **Impaired Driving**
- **Intersections**
- **Lane Departures**
- **Motorcyclists**
- Occupant Protection
- **Pedestrians**
- **Speed Management/ Aggressive Driving**
- Work Zones
- **Young Drivers (15-20 years old)**

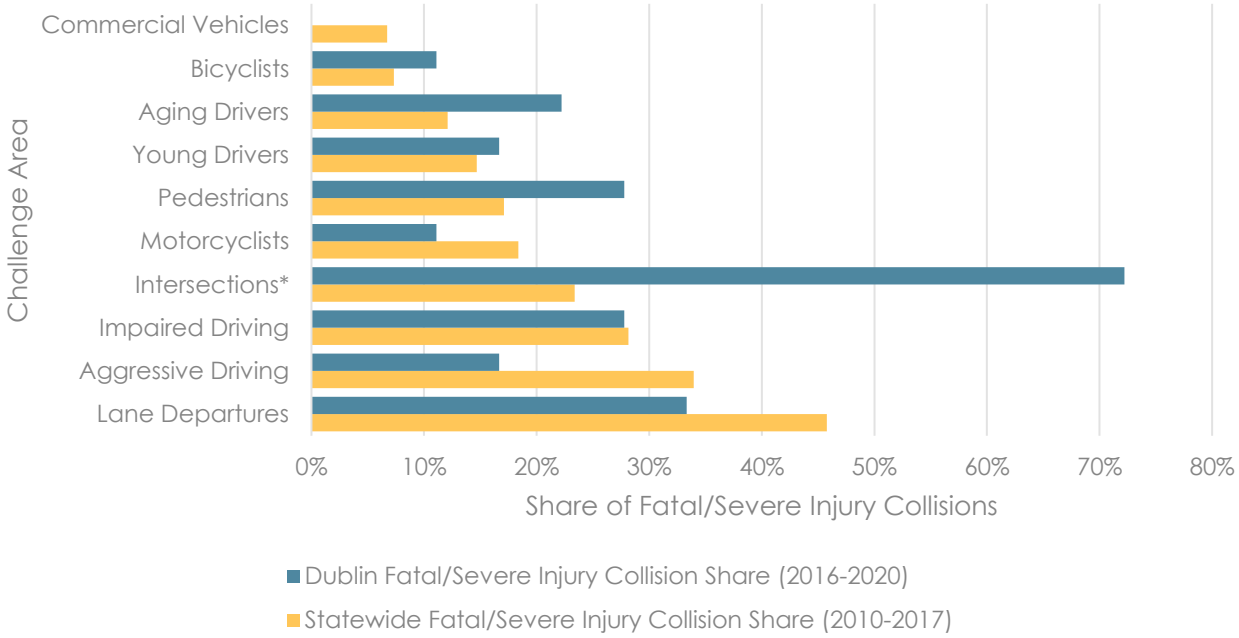
Figure 7 compares the share of fatal/severe injury collisions by challenge area between Dublin's 2016-2020 collision history and the statewide averages presented in the SHSP (based on 2010-2017 collision history).

The City has at least a 10% higher share of fatal and severe injury collisions than the statewide levels for the following challenge areas:

- Aging Drivers (22% compared to 12%)
- Pedestrians (28% compared to 17%)
- Intersections (72% compared to 23%)

Given the number of fatal/severe injury collisions in Dublin (18 over 5 years), only the intersection difference shows statistical significance when compared to statewide average. Nonetheless, the pedestrian and aging driver categories merit focus in LRSP emphasis area and goal development. The SHSP also classifies Intersections, Pedestrians, Bicyclists, Impaired Driving and Speed Management/Aggressive Driving as five of their high priority areas that would be similar to Dublin's LRSP emphasis area and goal development.

**Figure 7: Dublin vs. Statewide Challenge Area Involvement, Fatal/Severe Injury Collisions**




Source: SWITRS, 2021; City of Dublin, 2021; 2020-2024 SHSP

*Indicates difference is statistically significant at the 95% confidence level based on a difference of proportions t-test.

## 2.6 Recommended Emphasis Areas

Based on the analysis presented in Sections 2.2 through 2.5, recommended emphasis areas for the City include:

- **Pedestrian collisions:** These collisions account for 28% of all fatal/severe injury collisions as compared to 17% of all statewide fatal/severe injury collisions.
- **Nighttime safety:** A disproportionate share of fatal/severe injury collisions, including pedestrian collisions, occur in dusk/dawn or dark conditions.
- **Aging drivers:** These collisions account for 22% of all fatal/severe injury collisions as compared to 12% of all statewide fatal/severe injury collisions.
- **Signalized local/arterial intersections:** These intersections constitute the plurality of *rear end* and *broadside* collisions. *Hit object* collisions, which are the most frequent fatal/severe injury collision types, also primarily occur at signalized intersections.
- **Driver behavior:** Including impaired driving and aggressive driving.
    - *Impaired Driving* account for over 25% of all fatal/severe injury collisions in Dublin.
    - *Aggressive Driving* accounts for over 15% of all fatal/severe injury collisions in Dublin.

# 3 NETWORK SCREENING FINDINGS

Kittelson developed collision severity scores for two analysis scenarios; intersection collisions and roadway collisions. The collision severity scores will help the City identify priority locations for safety improvement projects.

## 3.1 Equivalent Property Damage Only (EPDO)

Kittelson used the equivalent property damage only (EPDO) score performance measure from the AASHTO *Highway Safety Manual*, which assigns weighting factors to collisions by severity relative to property damage only (PDO) collisions. The EPDO performance measure accounts for locations with the highest impact (e.g., locations with high severity collisions and/or high quantity of collisions) and closely aligns with Highway Safety Improvement Program (HSIP) funding. The EPDO calculation was performed for all public intersections and roadway segments, not including state highway facilities. The EPDO performance measure is described below. Moving forward throughout this document, the EPDO performance measure is referred to as a collision severity score.

The collision severity score assigns weight to individual collisions based on the collision severity and location of the collision (Table 16). Weights, provided by the 2020 *Caltrans' Local Roadway Safety Manual*, are based on the cost of property-damage-only (PDO) collisions, assigning each collision with a score relative to a PDO collision.

**Table 16: Collision Weights by Severity and Location Type**

| Location Type | Collisions Weighting by Severity | | | | |
|---|---|---|---|---|---|
| | Fatal | Severe Injury | Moderate Injury | Minor Injury | Property Damage Only |
| Signalized Intersection | 119.55 | 119.55 | 10.70 | 6.08 | 1.00 |
| Unsignalized Intersection | 190.23 | 190.23 | 10.70 | 6.08 | 1.00 |
| Roadway | 164.66 | 164.66 | 10.70 | 6.08 | 1.00 |

Source: Caltrans, *Local Roadway Safety: A manual for California's Local Road Owners* (Version 1.5), 2020.

The weights prioritize fatal and severe injury collisions equally to recognize that a death versus a severe injury is often a function of the individual involved (i.e., age or physical fitness) or of emergency response time. Therefore, both outcomes represent locations where the region may equally value improvements. Collision weights vary by location due to the relative costs associated with the collision severity at the location types. Specifically, unsignalized intersections have a higher cost for fatal and severe collisions because fatal and severe collisions at these locations tend to result in more severely injured persons on average.

### Intersection Methodology

Kittelson first identified signalized and unsignalized intersections in the City roadway network and then defined collisions as intersection or segment collisions. An intersection collision is defined as a collision that occurs within 250 feet of the intersection. These collisions were spatially joined and summarized in ArcGIS to show the total number of collisions by severity at each intersection. Where intersections were less than 500 feet from each other, collisions were assigned to the nearest of the two intersections. Collisions occurring

more than 250 feet from any intersection were separated to be used in the roadway segment analysis discussed below.

The collision severity score is calculated by multiplying each collision severity total by its associated weight and summing the results, using the following formula:

*Collision Severity Score = Fatal weight * # of fatal collisions + severe injury weight * # of severe injury collisions + moderate injury weight * # of moderate injury collisions + minor injury weight * # of minor injury weight collisions + property damage only collisions*

The collision severity score is annualized by dividing the score by the number of years (five) of collision data used in the analysis.

#### Roadway Methodology

After completing the intersection analysis, Kittelson used the collisions reported more than 250 feet from the nearest intersection to conduct a separate segment analysis. A Python script in ArcGIS allowed for splitting the Dublin roadway network into overlapping half-mile (0.5) segments, incrementing the segments by one quarter (0.25) of a mile. This methodology helps to identify portions of roadway with the greatest potential for safety improvements.

After splitting the network, the Python script spatially joined non-intersection collisions to each segment. Like the intersection methodology above, collisions were summarized by severity, and the totals were multiplied by the collision severity weights for roadway segments. The weighted collision severity scores of the collisions were totaled and annualized by the number of years of collision data (five) to generate an annualized collision severity score.

## 3.2 Results

### 3.2.1 NETWORK SCREENING RESULTS

This analysis scenario included total reported collision from the last 5 years of data. For intersection locations, the collision severity scores ranged from zero (no reported collisions during the 5 years) to 59.87. For the half-mile roadway segments, the collision severity scores ranged from zero to 36.16. Figure 8 and Figure 9 show the results of the collision severity scoring by percentiles for intersection locations and roadway segments, respectively. Intersections or segments are excluded from the figures if no collisions were reported at that location.

**Figure 8. Intersection Collision Severity Scores**

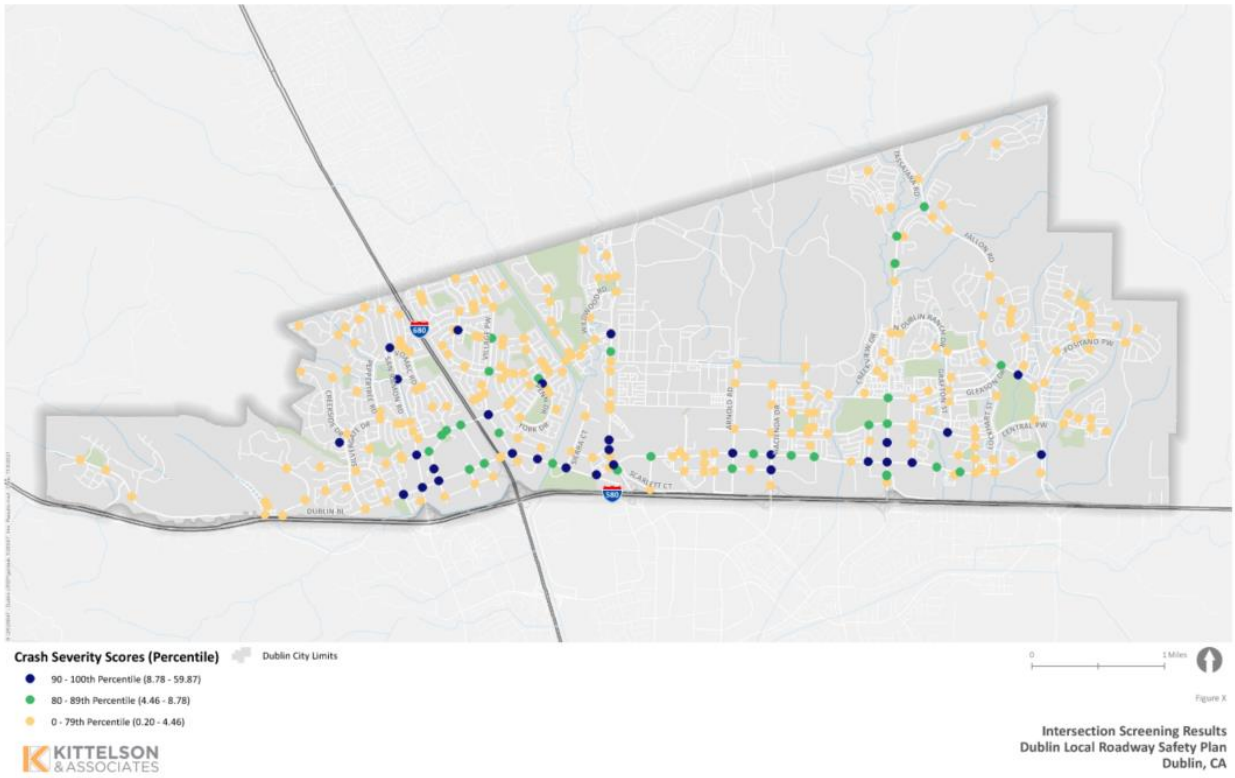
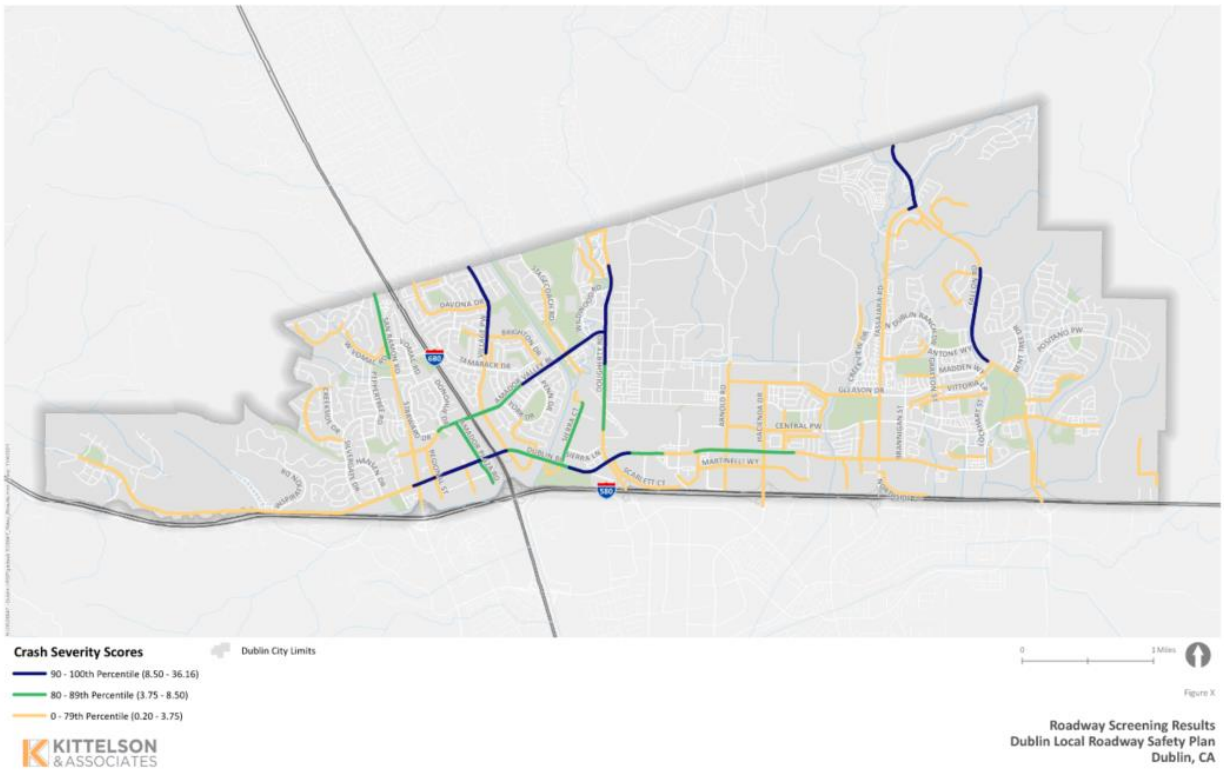


**Figure 9. Roadway Collision Severity Scores**



## 3.2.2 PRIORITY LOCATIONS

Kittelson identified priority intersections and segments using the annualized collision severity score for intersections and segments. The top 15 intersections (top 5th percentile) and 5 roadway segments (top 8th percentile) were identified. The resulting list of priority locations is provided in Table 17 and shown in Figure 10. The top scoring intersections and segments were reviewed to determine priority locations for safety improvements and upcoming HSIP applications. The final list of priority locations may change from the table below.

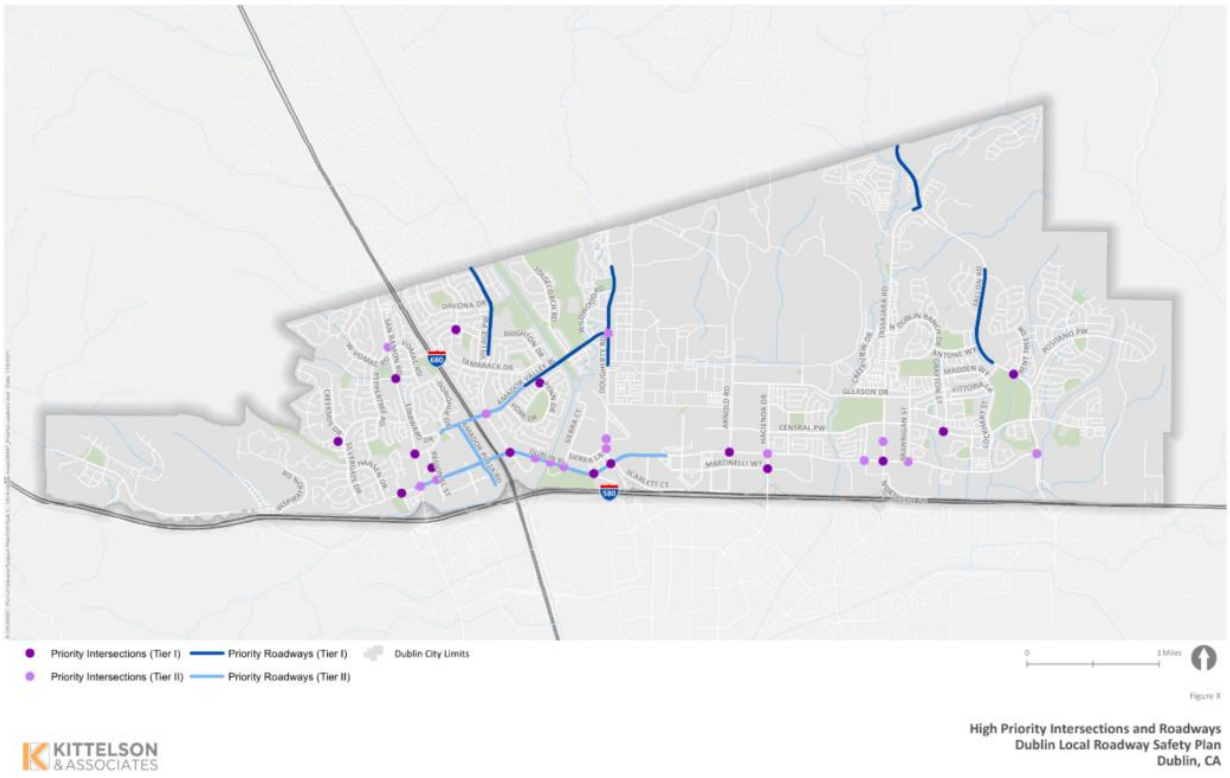
**Table 17. Priority Intersections and Roadways**

| # | Location | Location Type | Collision Severity Score | Total No. Collisions | Fatal/Severe Injury Collisions | Other Injury Collisions | PDO Collisions |
|---|---|---|---|---|---|---|---|
| ***Priority Intersections*** | | | | | | | |
| 1 | Arnold Rd & Dublin Blvd | Signalized Intersection | 59.9 | 17 | 2 | 8 | 7 |
| 2 | Dublin Blvd & Village Pkwy | Signalized Intersection | 49.4 | 43 | 1 | 15 | 27 |
| 3 | Donlon Way & Dublin Blvd | Unsignalized Intersection | 42.1 | 6 | 1 | 3 | 2 |
| 4 | Amador Valley Blvd & San Ramon Rd | Signalized Intersection | 41.1 | 18 | 1 | 9 | 8 |
| 5 | Regional St & Regional Common | Unsignalized Intersection | 38.8 | 5 | 1 | 0 | 4 |
| 6 | Winding Trail Ln & Rolling Hills Dr | Unsignalized Intersection | 38.0 | 1 | 1 | 0 | 0 |
| 7 | Lucania St & Brighton Dr | Unsignalized Intersection | 38.0 | 1 | 1 | 0 | 0 |
| 8 | Tyne Ct & Penn Dr | Unsignalized Intersection | 38.0 | 1 | 1 | 0 | 0 |
| 9 | Dublin Blvd & Dougherty Rd | Signalized Intersection | 37.2 | 65 | 0 | 22 | 43 |
| 10 | San Ramon Rd & Shannon Ave | Signalized Intersection | 29.3 | 8 | 1 | 3 | 4 |
| 11 | Dublin Ct & Dublin Blvd | Signalized Intersection | 27.3 | 13 | 1 | 1 | 11 |
| 12 | Dublin Blvd & Tassajara Rd | Signalized Intersection | 25.8 | 34 | 0 | 16 | 18 |
| 13 | Grafton St & Central Pkwy | Signalized Intersection | 24.3 | 3 | 1 | 0 | 2 |
| 14 | Bent Tree Dr & Fallon Rd | Signalized Intersection | 23.9 | 1 | 1 | 0 | 0 |
| 15 | Martinelli Way & Hacienda Dr | Signalized Intersection | 18.5 | 28 | 0 | 10 | 18 |
| ***Priority Roadways*** | | | | | | | |

| # | Location | Location Type | Collision Severity Score | Total No. Collisions | Fatal/Severe Injury Collisions | Other Injury Collisions | PDO Collisions |
|---|---|---|---|---|---|---|---|
| 1 | Dougherty Rd (north of Willow Creek Dr to south of 8th St) – *0.75 mi* | Arterial | 36.2 | 8 | 1 | 2 | 5 |
| 2 | Fallon Rd (Signal Hill Dr to Gleason Dr) – *0.75 mi* | Arterial | 35.5 | 4 | 1 | 1 | 2 |
| 3 | Village Pkwy (northern city limits to north of Tamarack Dr) – *0.69 mi* | Collector | 35.3 | 8 | 1 | 1 | 6 |
| 4 | Amador Valley Blvd (Burton St to Dougherty Rd) – *0.75 mi* | Arterial | 34.1 | 2 | 1 | 1 | 0 |
| 5 | Tassajara Rd (northern city limits to Fallon Rd) – *0.50 mi* | Arterial | 33.1 | 2 | 1 | 0 | 1 |

Note: Priority locations are based on collision severity scores and may change.

**Figure 10. Priority Intersections and Roadways**



# 4 NEXT STEPS

The findings presented above will be discussed, reviewed, and confirmed with City of Dublin staff. The findings will be used to develop countermeasure profiles for the most relevant safety treatments for the City based on identified collision risk and common collision patterns and trends. This analysis will also be used to determine the locations and projects most likely to provide the greatest potential collision reduction. Kittelson and the City will work together to identify locations for field observation and project development. Collectively, the information in this memorandum and follow-on recommendations from the next steps will be incorporated into the City's final LRSP.

# Attachment A
# Collision Database Review Memorandum

KITTELSON & ASSOCIATES
155 Grand Avenue, Suite 505
Oakland, CA 94612

# TECHNICAL MEMORANDUM

**October 7, 2021** Project# 26647

To: Sai Midididdi, TE
City of Dublin

From: Mike Alston, RSP; Erin Ferguson, PE; Grace Carsky; Jackson Lynch

RE: Dublin Local Roadway Safety Plan

## TASK 3.2 – TECHNICAL COLLISION DATABASE REVIEW

This memorandum presents an overview of the collision data available for the City of Dublin (City) and a recommendation on the appropriate data source to use in the development of the Dublin Local Roadway Safety Plan (LRSP). It is organized into the following sections:

- Data Sources
- Database Findings
- Recommendations

Kittelson compared collisions provided by the City from its database in Crossroads software to collisions obtained from the public California Statewide Integrated Traffic Records System (SWITRS) database. Several discrepancies were found between the total number of collisions and recorded collision severity in the databases, so Kittelson consulted police reports provided by the City to check a sample of collisions from both databases and make a recommendation.

The findings and recommendations of this memorandum establish the approach to compile a consolidated collision database for the Dublin LRSP. That database will be used for the high-collision locations analysis (Task 3.2), the identification of safety goals and countermeasures (Task 4), and the identification of geographic priorities for future projects (Task 5).

Kittelson recommends using SWITRS collision records and recorded severities for the 2016-2020 period and augmenting with the 141 unique collisions from the Crossroads database to create a complete and consolidated dataset for the forthcoming LRSP analysis efforts.

### DATA SOURCES

Kittelson obtained the most recently reported collision data from the City's Crossroads collision database, representing collisions occurring July 2015 through February 2021. Kittelson obtained collision dated from the SWITRS database for the same period (July 2015 through February 2021).

The five most recent available years of complete data (January 2016 to December 2020) will be used for the project's analysis and were therefore analyzed to compare databases.

Police reports for a sample of collisions were obtained from the City and compared to the matching records in each database.

## DATABASE FINDINGS

The Crossroads database included 1,366 collisions between January 2016 and December 2020. The SWITRS database included 1,314 collisions during the same period (Figure 1). These collisions were categorized into different severities (Table 1). The total number of fatal and severe injury collisions was equal between the two data sources, but there were clear discrepancies between the level of other injury collisions and total collisions reported annually.

**Figure 1. Total Number of Collisions, 2016-2020**

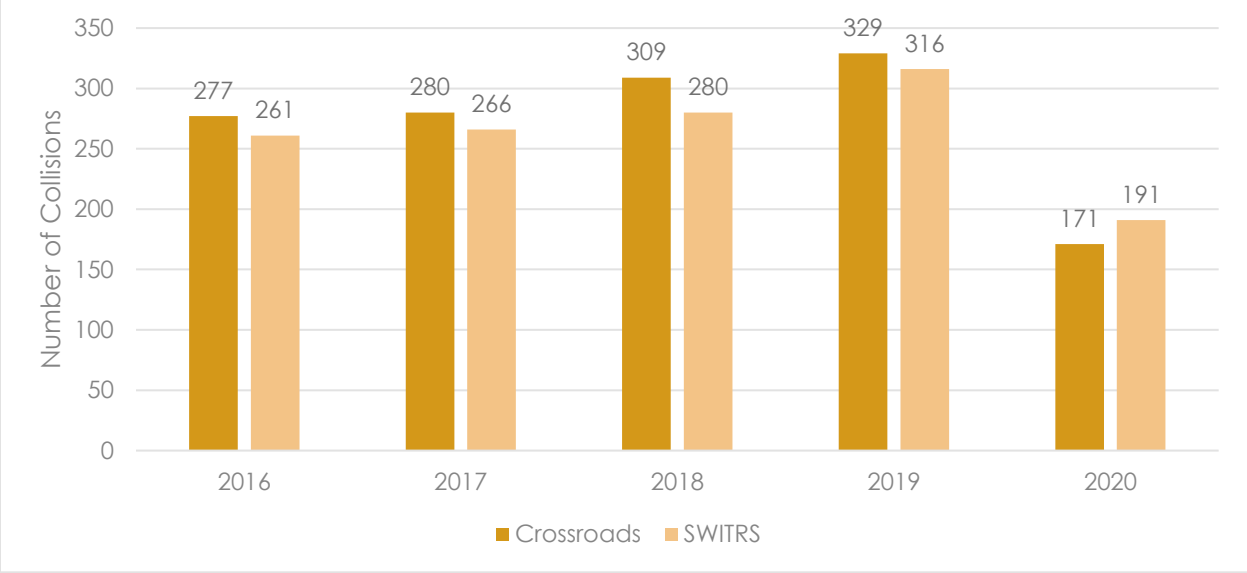



**Table 1. Crossroads and SWITRS Collision Severities**

| | Crossroads | SWITRS |
|---|---|---|
| *Fatal* | 2 | 2 |
| *Severe Injury* | 15 | 15 |
| *Other Visible Injury* | 277 | 141 |
| *Complaint of Pain* | 86 | 327 |
| *Property Damage Only* | 986 | 829 |
| ***Total*** | **1,366** | **1,314** |

Kittelson used collision time, date, and location to cross-reference collision reports between Crossroads and SWITRS. Each database contained unique collision records not present in the other database. Of the 1,366 Crossroads collisions, 141 were unique to the database and not included in the SWITRS database. Of the 1,314 SWITRS collisions, 89 were unique to the database.

1,225 collision records were in both databases, and 431 of these were coded with different collision severities between the two databases (Table 2). Most notable is the discrepancy of one collision coded as a severe injury collision in SWITRS and a property damage only (PDO) collision in Crossroads.

**Table 2. Comparison Matrix of Crossroads and SWITRS Collision Severities – All Common Collisions**

| Crossroads Collision Severity | SWITRS Collision Severity: Fatal | Severe Injury | Other Injury | Complaint of Pain | PDO | *Total* |
|---|---|---|---|---|---|---|
| Fatal | **2** | | | | | *2* |
| Severe Injury | | **14** | | | | *14* |
| Other Visible Injury | | | **18** | 246 | | *264* |
| Complaint of Pain | | | *75* | **1** | 1 | *77* |
| PDO | | 1 | 38 | 70 | **759** | *868* |
| *Total* | *2* | *15* | *131* | *317* | *760* | ***1,225*** |

Note: Bold numbers indicate the number of collisions that were recorded with the same collision severity in both the Crossroads and SWITRS databases.

Police reports for three collisions with different severities were obtained to check the police reports' recorded severity at the time of the event against the Crossroads and SWITRS databases. One report (D2003567) was selected due to the wide discrepancy between the severity reporting: Crossroads recorded the collision as PDO collision while SWITRS recorded the collision as a severe injury collision. The other two collisions were selected at random as representative other collision records with discrepancies: one where Crossroads recorded a higher level of severity and one where SWITRS recorded a higher level of severity. Table 3 presents the findings of the police report comparison.

Report D2003567 determined the collision to result in a severe injury, and Report D1900667 determined the collision to result as an other visible injury collision. However, both were entered as PDO collisions in Crossroads. The SWITRS database matched the severity of the police reports. Report D1602575 determined the collision to result as an other visible injury in the collision description, but neither database matched this coding. Crossroads did not match the police reports for any of the three reported collisions; SWITRS matched for two of the three.

**Table 3. Comparison Matrix of Crossroads and SWITRS Collision Severities – Specific Collisions**

| Crossroads Report No. | SWITRS Case ID | Crossroads Severity | SWITRS Severity | Determined Severity |
|---|---|---|---|---|
| D2003567 | 9204895 | Property Damage Only | Severe Injury | Severe Injury |
| D1602575 | 8131511 | Complaint of Pain | Property Damage Only | Other Visible Injury |
| D1900667 | 8810265 | Property Damage Only | Other Visible Injury | Other Visible Injury |

## RECOMMENDATIONS

After comparing the Crossroads and SWITRS databases against each other and verifying severity of a sample of collision records using police reports, Kittelson recommends using SWITRS collision records and recorded severities for the 2016-2020 period and augmenting with the 141 unique collisions from the Crossroads database to create a complete and consolidated dataset for the forthcoming LRSP analysis efforts.

This verification step also highlights the need for database maintenance. As the main source of information for city staff to review collision history, having accurate collision information is

important. The City could review their Crossroads data input methodologies and could consider regularly taking a sample of police reports and comparing those against data entered into the Crossroads database to verify accuracy of the Crossroads data.

# APPENDIX C: COUNTERMEASURE TOOLBOX

# ENGINEERING COUNTERMEASURES

This section presents engineering countermeasures – treatments to reduce crashes and improve safety on roadways – organized by treatment location type:

- Signalized intersections
- Unsignalized intersections
- Roadways

Treatments that are applicable to more than one location type are listed in all applicable categories.

## SIGNALIZED INTERSECTIONS

This section presents recommended engineering countermeasures at signalized intersections in Dublin. Detailed description of each measure is provided further in the document.

Table 1: Summary of Signalized Intersection Countermeasures and Related Information

| Countermeasure Name | CM ID* | Documented Crash Reduction Factor** | Federal Funding Eligibility through HSIP*** | Cost Estimate[t] | Emphasis Area | Page Reference |
|---|---|---|---|---|---|---|
| **Motor Vehicle Treatments** | | | | | | |
| Add intersection lighting | S01 | 40% | 100% | $ | Nighttime Safety, Signalized Local/Arterial Intersections | 3 |
| Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number | S02 | 15% | 100% | $ | Signalized Local/Arterial Intersections | 4 |
| Provide advanced dilemma-zone detection for high-speed approaches | S04 | 40% | 100% | $ - $$ | Nighttime Safety, Signalized Local/Arterial Intersections | 5 |
| Install left-turn lane and add turn phase | S06/S07 | 55% | 90% | $ - $$$ | Signalized Local/Arterial Intersections | 6 |
| Convert signal to mast arm (from pedestal-mounted) | S08 | 30% | 100% | $ - $$$ | Signalized Local/Arterial Intersections | 7 |
| Install raised median on approaches | S12 | 25% | 90% | $ - $$$ | Signalized Local/Arterial Intersections | 8 |

| Countermeasure Name | CM ID* | Documented Crash Reduction Factor** | Federal Funding Eligibility through HSIP*** | Cost Estimate‡ | Emphasis Area | Page Reference |
|---|---|---|---|---|---|---|
| Create directional median openings to allow (and restrict) left-turns and U-turns (signalized intersection) | S14 | 50% | 90% | $ - $$ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 9 |
| Signalized intersection conspicuity treatments | Varies | Varies | Varies | $ - $$ | Signalized Local/Arterial Intersections, Driver Behavior | 13 |
| No Right Turn on Red (RTOR)[1] | N/A | N/A | N/A | $ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 10 |
| Centerline hardening[1] | N/A | N/A | N/A | N/A | Pedestrian Crashes | 11 |
| Convert intersection to roundabout (from signal) | S16 | 35-67%** | 100% | $ - $$$ | Signalized Local/Arterial Intersections | 12 |
| **Pedestrian/Bicycle Treatments** | | | | | | |
| Install pedestrian countdown signal heads | S17PB | 25% | 100% | $ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 13 |
| Install pedestrian crossing | S18PB | 25% | 100% | $ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 16 |
| Install pedestrian scramble | S19PB | 40% | 100% | $ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 17 |
| Install advance stop bar before crosswalk (Bicycle Box) | S20PB | 15% | 100% | $ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 18 |
| Modify signal phasing to implement a Leading Pedestrian Interval (LPI) | S21PB | 60% | 100% | $ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 19 |
| Install painted safety zone | N/A | N/A | N/A | $ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 20 |
| Install Protected Intersection Elements | N/A | N/A | N/A | $ - $$$ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 21 |

*CM ID refers to the Countermeasure ID from the Caltrans *Local Roadway Safety Manual* (April 2020, LRSM). If a CM ID is not listed, the countermeasure is not listed in the LRSM. Local Roadway Safety - A Manual for California's Local Road Owners

**Documented crash reduction factors are derived either from the *LRSM* or the FHWA's *Proven Safety Countermeasures* resource, unless otherwise noted. An "N/A" indicates that a documented, research-backed crash reduction factor does not exist.

***Funding eligibility indicates the designated federal contribution level for approved HSIP projects in California associated with Caltrans HSIP Cycle 10. This is subject to change from one cycle to the next and should be confirmed with the state HSIP coordinator.

‡ $ - $50,000 or less; $$ - $50,000 to $100,000; $$$ - $100,000 or more

# MOTOR VEHICLE TREATMENTS

## Add Intersection Lighting

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Nighttime | Nighttime Safety, Signalized Local/Arterial Intersections | 40% | 100% | $ | Yes |

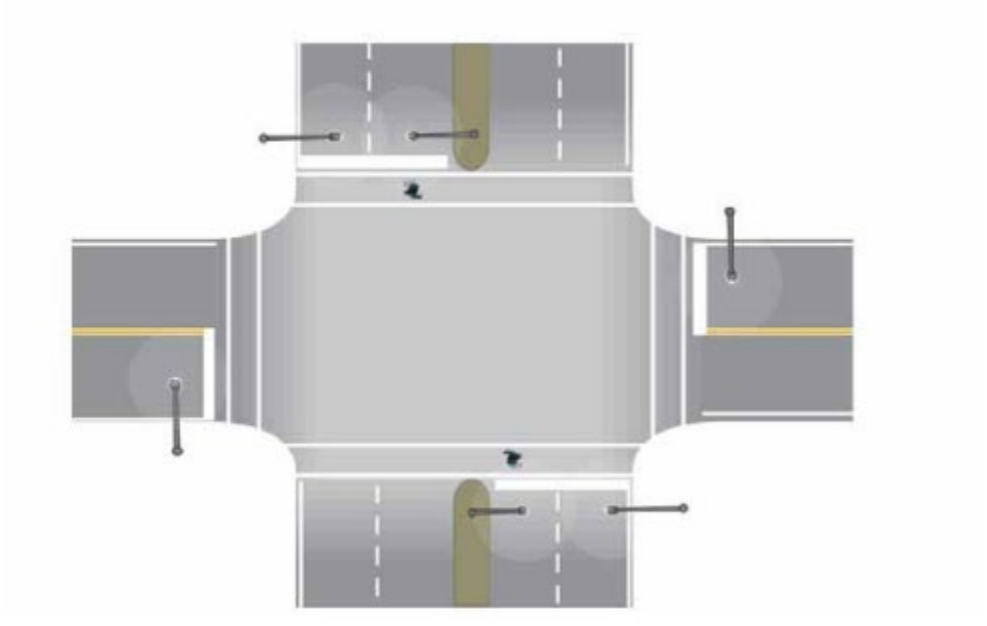
### What is it?

Lighting may be improved at an intersection, its approaches, or a roadway segment to make drivers more aware of the surroundings at an intersection, enhance drivers' available sight distances, and improve the visibility of non-motorists at an intersection. In commercial areas or in downtown areas where there is more pedestrian activity, pedestrian-scale lighting may be placed over sidewalks to help pedestrians navigate the intersection safely. Intersection lighting improvements may be considered at intersections that have a disproportionate number of night-time crashes and do not currently provide lighting at the intersection or at its approaches.

### What are some considerations for use?

These treatments may be considered when high frequencies of night-time crashes have occurred at a signalized intersection. Avoid placing the light source behind pedestrians at crossing locations (Figure 1).

Figure 1. Example of Intersection Lighting



*Source: FHWA* Informational Report on Lighting Design for Midblock Crosswalks

## Improve Signal Hardware: Lenses, Back-Plates with Retroreflective Borders, Mounting, Size, and Number

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Rear-end, Broadside | Nighttime Safety, Signalized Local/Arterial Intersections | 40% | 100% | $ | Y |

### What is it?

- **Lenses:** New lenses with LED lighting increases visibility of the traffic signal.
- **Back-plates with retroreflective borders**: This treatment warns drivers of the upcoming signalized intersections by making signal heads more visible in daytime and nighttime conditions. Signal hardware upgrades may be considered where crash patterns indicate visibility of the intersection or signal heads may benefit from enhancements.
- **Mounting**: Mounting assemblies include mast arms, span wires, and side-mounted vehicular signals. Upgrading the mounting assembly may improve the longevity of the signal hardware.
- **Size and Number**: Increasing the size and/or numbers may improve visibility of the signal.

### What are some considerations for use?

This treatment may be considered when high frequencies of broadside, rear-end, or other conflicting movement crashes are occurring at a signalized intersection related to signal conspicuity.

Figure 2. Signal with Retroreflective Borders




Source: FHWA

## Provide Advanced Dilemma-Zone Detection for High Speed Approaches

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Rear-end | Nighttime Safety, Signalized Local/Arterial Intersections | 40% | 100% | $ - $$ | Y |

### What is it?

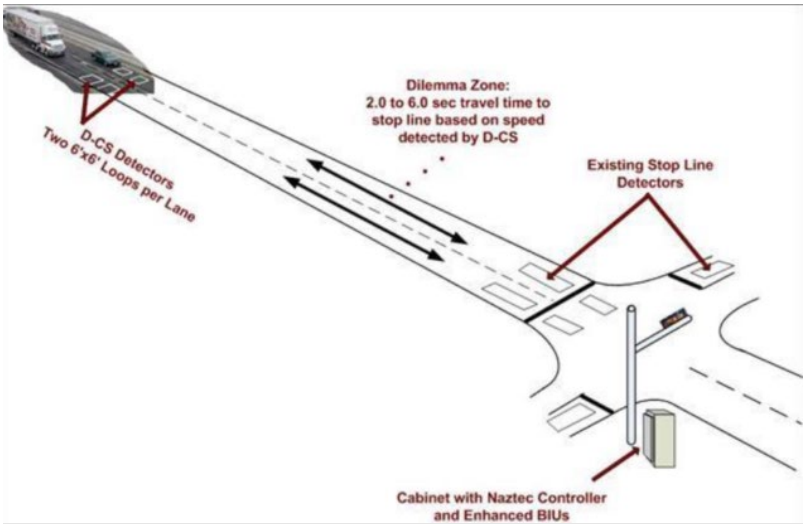
This treatment consists of adding new advance detection and signal hardware to detect vehicles that may approach the intersection in the "dilemma zone" of deciding whether to stop or proceed during a yellow phase. The detection system modifies the signal timing to reduce the numbers of drivers needing to make this decision and the potential for conflicts due to phase changes.

Providing advanced dilemma-zone detection can help reduce conflicts due to late-entering vehicles proceeding through the intersection or conflicts arising from hard-stopping vehicles due to the dilemma of whether to proceed or stop during the yellow phase of a signal. Advanced dilemma-zone detection can help reduce the frequency of red-light violations, crashes associated with phase changes, and may provide operational benefits.

### What are some considerations for use?

This treatment may be considered when high frequencies of crashes involve hard-stopping vehicles resulting in rear-end crashes, or there is a pattern of crashes related to late-entering vehicles or vehicles running red lights.

Figure 3. Example Layout of Dilemma-Zone Detection




Source: FHWA

## Install Left-Turn Lane and Add Turn Phase

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Crashes related to left-turning vehicles (broadside, rear-end, sideswipe) | Signalized Local/Arterial Intersections | 55% | 90% | $ - $$$ | Y |

### What is it?

This treatment consists of adding a new protected left-turn phase to a signal where left-turns are currently permitted and, if no left-turn lane currently exists, adding a left-turn lane to allow left-turning vehicles to queue separately from through movement traffic. This treatment includes both adjustments to signal timing as well as new signal hardware to provide for the protected movement.

Protected left-tun phasing can help reduce rear-end or sideswipe crashes related to left-turn vehicle conflicts with oncoming traffic or vehicles behind them where permitted left-turns are allowed. This phasing removes the need for left-turning drivers to navigate through gaps in opposing through vehicles.

### What are some considerations for use?

These treatments may be considered when high frequencies of crashes involving left-turning vehicles are occurring at a signalized intersection. Adding a protected phase will likely require new signal heads, may require a new mast arm and pole if the existing mast arm could not support the new signal heads, and may require roadway widening.

Figure 4. Example of Protected Left-Turn Lane and Phase




Source: Google Earth

## Convert Signal to Mast Arm (from Pedestal-Mounted)

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Rear-end, broadside | Signalized Local/Arterial Intersections | 30% | 100% | $ - $$$ | N |

### What is it?

Conversion of pedestal-mounted intersections to mast arms can improve visibility of the traffic signals. Providing better visibility of intersection signs and signals aids drivers' advance perception of the upcoming intersection.

### What are some considerations for use?

These treatments may be considered when high frequencies of broadside, rear-end, night-time or other conflicting movement crashes are occurring at a signalized intersection that may be related to intersection and signal conspicuity.

Figure 5. Example of Mast Arm




Source: AA Roads

## Install Raised Median on Approaches

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Broadside | Signalized Local/Arterial Intersections | 25% | 90% | $ - $$$ | Y |

### What is it?

This treatment consists of adding new raised medians on the approaches to intersections to control and restrict movements from access points (e.g., driveways from commercial and retail areas) on the approach to a signalized intersection. Adding raised medians can help reduce conflicts by restricting access-related movements to the roadway on the approaches to an intersection. The raised medians prohibit left-turns into and out of driveways that may be located within the influence area of the intersection to reduce potential conflicts.

### What are some considerations for use?

These treatments may be considered when high frequencies of crashes involve left-turning vehicles on the approach to any intersection are present or there is other evidence of access-related crashes on the intersection approaches. At signalized intersections, the addition of raised medians and median noses can be installed to create pedestrian refuge islands, providing an additional benefit to pedestrians and bicyclists crossing the intersection. However, implementation of these treatments will need to balance access to businesses where restrictions occurred with safety benefits in commercial and retail areas.

Figure 6. Example of Raised Median




Source: Kittelson

## Create Directional Median Openings to Allow (and Restrict) Left-Turns and U-Turns

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Broadside, Rear-end, Pedestrian, Sideswipe (involving left turns) | Pedestrian Crashes, Signalized Local/Arterial Intersections | 50% | 90% | $ - $$ | Y |

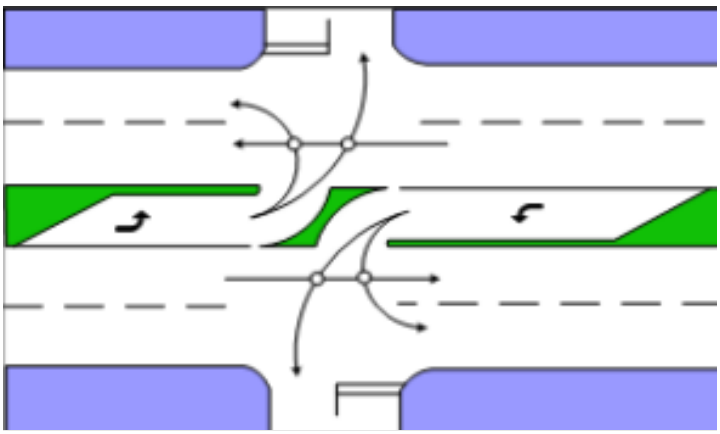
### What is it?

This treatment may be used at signalized or unsignalized intersections and mid-block locations on roadways that have turning movement crashes near the intersection or at driveway access points. This treatment can improve access control at intersections and mid-block roadway segments. Application of this countermeasure should be based on current crash data and a clearly defined need to restrict or accommodate the movement. Raised medians next to left-turn lanes at intersections can offer a cost-effective means for reducing crashes and improving operations at higher volume intersections. The raised medians prohibit left turns into and out of driveways that may be located too close to the functional area of the intersection.

### What are some considerations for use?

A clustering of similar turning movement-related crashes may indicate a candidate movement to restrict. Raised medians at intersections may be most effective in retrofit situations where high volumes of turning vehicles have degraded operations and safety, and where more extensive countermeasures would be too expensive because of limited right-of-way and the constraints of the built environment.

Figure 7. Diagram of a Directional Median Opening



Source: Texas A&M Transportation Institute

## No Right Turn on Red (RTOR)

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes, Signalized Local/Arterial Intersections | N/A | N/A | $ | Y |

### What is it?

This treatment restricts motorists from turning right during the red light. In California, turning right on red is not a default condition of the existing laws. Drivers in California are advised of this restriction with the posting of "No Turn on Red" signs (static or dynamic), according to the sign specifications for MUTCD R10-11 in California Manual on Uniform Traffic Control Devices (CA-MUTCD). Dynamic signs can be used to restrict right turns during certain times of day or during certain signal phases.

### What are some considerations for use?

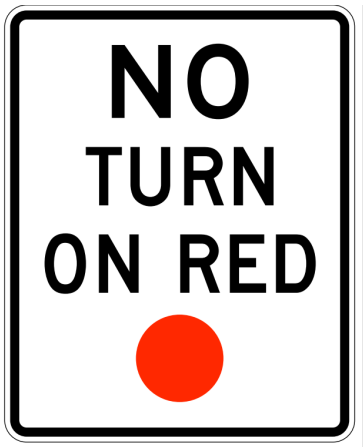
No RTOR treatments may be considered at signalized intersections, specifically at intersections with medium to high motor vehicle turning volumes and pedestrian volumes. This treatment may be considered at intersections with exclusive pedestrian phase, and school crossings.

Figure 8. Example of Dynamic No Right Turn Sign (can be included on red phase)




Source: Flickr 2018

Figure 9. MUTCD R10-11 Sign




Source: Traffic Signs

## Centerline Hardening

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian and Bicycle | Pedestrian Crashes | N/A | N/A | N/A | Y |

### What is it?

The Basic Hardened Centerline treatment consists of five pieces of rubber curb and bollards and/or rubber speed bumps installed on the centerline and extending at maximum of six feet into the intersection. This is a turn calming treatment that addresses intersections with left and right turns.

The Complete Hardened Centerline treatment includes five pieces of rubber curb and bollards and/or rubber speed bumps, "No Parking" markings and slow turn wedge/box markings coupled with flexible plastic posts.

### What are some considerations for use?

A Basic Hardened Centerline treatment is installed where one-way or two-way road meets at two-way road. A Complete Hardened Centerline treatment is installed where one-way road meets a two-way road.

Figure 10. Basic Centerline Hardening



Source: NYC.GOV



Source: Kittelson

## Convert Intersection to Roundabout (from Signal)

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| All | Signalized Local/Arterial Intersections | 35-67% | 100% | $ - $$$ | N |

### What is it?

This treatment consists of installing a roundabout as traffic control at an intersection. A roundabout is a type of circular intersection without traffic signals or stop signs, where drivers travel counterclockwise around a center island. When entering the roundabout, drivers yield to existing traffic, then enter the intersection and exit in their desired direction. Roundabouts are designed to eliminate left turns by requiring traffic to exit to the right of the circle. Roundabouts are installed to manage vehicular speeds through the intersection, improve safety at intersections by eliminating broadside and head-on crashes, and help traffic flow more efficiently.

### What are some considerations for use?

This treatment may be considered at any intersection with a high frequency of reported crashes, traffic delays, complex geometry (more than four approach roads), frequent left-turns, and/or relatively balanced traffic flows.

Roundabouts work well for intersections with low-to-moderate traffic speeds, and lower traffic volumes. Per the NCHRP 672: Roundabout Informational Guide, the typical daily service volumes for four-leg roundabouts are as follows:

- Up to 15,000 veh/day for a mini-roundabout with desirable entry design speed of 15-20 mph,
- Up to 25,000 veh/day for a single-lane roundabout with desirable entry design speed of 20-25 mph, and,
- 25,000 – 45,000 veh/day for a multi-lane roundabout (2-lane entry) with desirable entry design speed of 25-30 mph.

Figure 11. Example of Roundabout



Source: Kittelson

# CONSPICUITY TREATMENTS

| Countermeasure | Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|---|
| Install flashing beacons as advance warning (Signalized Intersection) | Rear-end, Broadside | Signalized Local/Arterial Intersections | 30% | 100% | $ - $$ | Y |
| Install raised pavement markers and striping (Through Intersection) | Wet, Night, All | Nighttime Safety, Signalized Local/Arterial Intersections, Driver Behavior | 10% | 100% | $ | Y |

## Install Flashing Beacons as Advance Warning

### What is it?

Flashing beacons are highway traffic signals operates in a flashing mode. This treatment leads to increased driver awareness of an approaching signalized intersection and an increase in the driver's time to react. Driver awareness of both downstream intersections and traffic control devices is critical to intersection safety. Crashes often occur when the driver is unable to perceive an intersection, signal head or the back of a stopped queue in time to react. Advance flashing beacons can be used to supplement and improve driver attention to intersection control signs. Most advance warning flashing beacons can be powered by solar, thus reducing the issues relating to power source.

### What are some considerations for use?

Flashing beacons should be used at signalized intersections with crashes that are a result of drivers being unaware of the intersection or are unable to see the traffic control device in time to comply.

Figure 12. Example of Flashing Beacons as Advance Warning



Source: Kittelson

## Install Raised Pavement Markers and Striping

### What is it?

Raised pavement markers and striping through the intersection can clarify the preferred path of travel through the intersection to help avoid potential conflicts. Providing more effective guidance through an intersection will minimize the likelihood of a vehicle leaving its appropriate lane and encroaching upon an adjacent lane. This treatment should be used where signalized intersection footprints are large, skewed, or have multiple turn lanes for a given movement.

### What are some considerations for use?

Raised pavement markers and striping should be used where signalized intersection footprints are large, skewed, or have multiple turn lanes for a given movement. They are most effective at intersections where the lane designations are not clearly visible to approaching motorists and/or intersections noted as being complex and experiencing crashes that could be attributed to a driver's unsuccessful attempt to navigate the intersection.

Figure 13. Example of Raised Pavement Markers and Striping



Source: Traffic Works

# PEDESTRIAN/BICYCLE TREATMENTS

## Install Pedestrian Countdown Signal Heads

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes, Signalized Local/Arterial Intersections | 25% | 100% | $ | Y |

### What is it?

Pedestrian countdown signals contain a timer display and count down the number of seconds left to finish crossing the street. Countdown signals can reassure pedestrians who are in the crosswalk when the flashing "DON'T WALK" interval appears that they still have time to finish crossing. Countdown signals begin counting down either when the "WALK" or when the flashing "DON'T WALK" interval appears and stop at the beginning of the steady "DON'T WALK" interval. These signals also have been shown to encourage more pedestrians to use the pushbutton rather than cross illegally.

### What are some considerations for use?

This treatment may be considered at signals that have signalized pedestrian crossing with "WALK"/"DON'T WALK" indicators and where there have been pedestrian crashes.

Figure 14. Example of Pedestrian Countdown Signal Head




Source: Maricopa Association of Governments

## Install Pedestrian Crossing

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes, Signalized Local/Arterial Intersections | 25% | 100% | $ | Y |

### What is it?

This treatment alerts drivers and enhances pedestrian and bicycle safety at pedestrian crossings. Installing pedestrian crossings at intersections can improve pedestrian and bicycle safety by designating a dedicated portion of the roadway for pedestrian and bicycle crossing. This helps to reduce pedestrian-related crashes that occur within 50 feet of an intersection. The use of high-visibility crosswalk markings, pedestrian countdown signals, and appropriate signs can enhance pedestrian and bicycle safety at pedestrian crossings.

### What are some considerations for use?

This treatment may be considered at signalized intersections with no marked crossing and pedestrian signal heads, where pedestrians are known to be crossing intersections that involve significant turning movements. They are especially important at intersections with (1) multiphase traffic signals, such as left-turn arrows and split phases, (2) school crossings, and (3) double-right or double-left turns. At signalized intersections, pedestrian crossings are often safer when the left turns have protected phases that do not overlap the pedestrian walk phase. Caltrans HSIP does not provide reimbursement for visibility enhancements to existing marked crosswalks at signalized intersections. However, such improvements (like restriping transverse lines as high-visibility crosswalks) still provide visibility benefit and are worth consideration.

Figure 15. Example of Pedestrian Crossing at a Signalized Intersection



Source: NACTO

## Install Pedestrian Scramble

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes, Signalized Local/Arterial Intersections | 40% | 100% | $ | Y |

### What is it?

This treatment allows pedestrian movements in all directions simultaneously, including diagonally. This is a traffic signal operation that functions differently than a standard signal operation because it allows for an exclusive pedestrian phase, i.e., all pedestrians to cross in any direction while all vehicles are stopped.

### What are some considerations for use?

Pedestrian scrambles may be implemented along with No Right Turn on Red treatment at intersections with high pedestrian volumes.

Figure 16. Example of Pedestrian Scramble




Source: Wall Street of the Rockies

## Install Advance Stop Bar before Crosswalk (Bicycle Box)

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes, Signalized Local/Arterial Intersections | 15% | 100% | $ | Y |

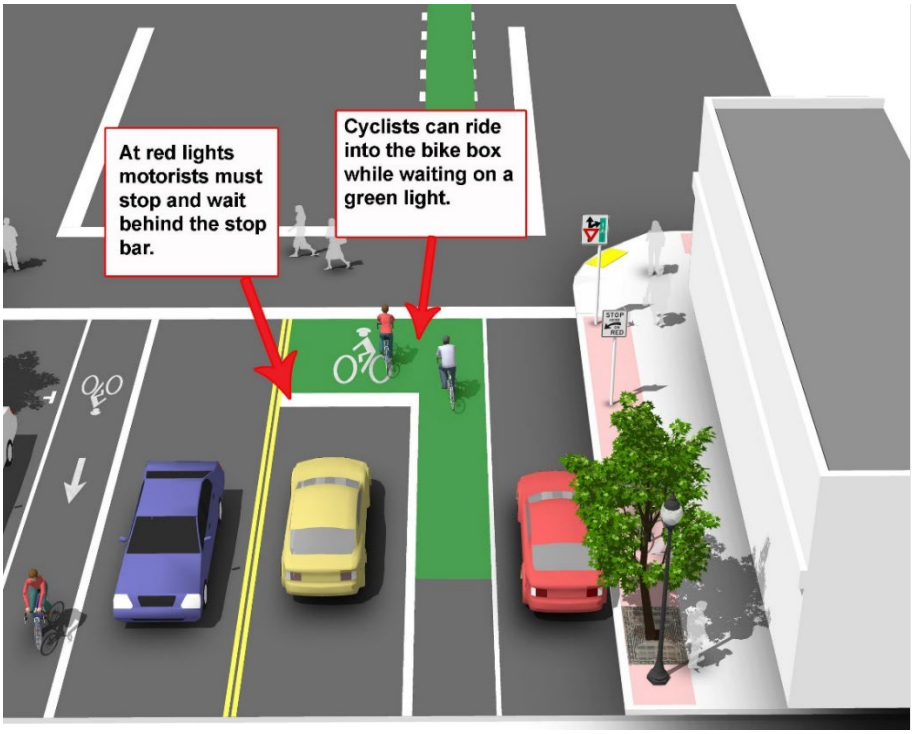
### What is it?

Adding advance stop bar before the striped crosswalk has the opportunity to enhance both pedestrian and bicycle safety. Stopping cars well before the crosswalk provides a buffer between the vehicles and the crossing pedestrians. It also allows for a dedicated space for cyclists, making them more visible to drivers (This dedicated space is often referred to as a bike-box.)

### What are some considerations for use?

This treatment should be used at signalized intersections with a marked crossing, where significant bicycle and/or pedestrians volumes are known to occur.

Figure 17. Diagram of Advance Stop Bar Before Crosswalk and Bike Box




Source: BikePGH

## Modify Signal Phasing to Implement a Leading Pedestrian Interval (LPI)

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes, Signalized Local/Arterial Intersections | 60% | 100% | $ | Y |

### What is it?

LPIs provide pedestrians a head start when crossing at a signalized intersection. LPIs can be easily programmed into existing signals to give pedestrians the "Walk" signal a minimum of 3 to 7 seconds before motorists are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk before motorists have priority to turn left at the intersection. LPIs can be provided automatically with each phase or provided only when actuated (actively or passively). LPIs increase visibility of crossing pedestrians and reduce conflicts between pedestrians and vehicles. This treatment increases the likelihood of motorists yielding to pedestrians.

### What are some considerations for use?

LPIs may be considered at signalized intersections, specifically at intersections with medium to high motor vehicle turning volumes and pedestrian volumes. LPIs may be considered at locations with particularly high elderly populations, high crash history, or at school crosswalks.

Figure 18. Example of Leading Pedestrian Interval




Source: Go Active Long Beach

## Painted Safety Zone

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes, Signalized Local/Arterial Intersections | N/A | N/A | $ | Y |

### What is it?

Painted safety zones provide a low-cost curb extension that improves pedestrian safety at intersection corners in three ways:

- Creating distance between turning vehicles and waiting pedestrians
- Slowing vehicle turning movements
- Improve visibility between drivers and crossing pedestrians

### What are some considerations for use?

Painted safety zones do not extend the sidewalk or create a formal waiting area but do provide low-cost improvements wherever vehicles are turning across pedestrian or bicyclist paths. Verify vehicle turn templates for vehicles expected to make turns at the treatment intersection.

Figure 19: Example Painted Safety Zone




Source: SFMTA

## Protected Intersection Elements

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes, Signalized Local/Arterial Intersections | N/A | N/A | $ - $$$ | Y |

### What is it?

The elements that form what is commonly called a "protected intersection" combine to achieve the following design goals:

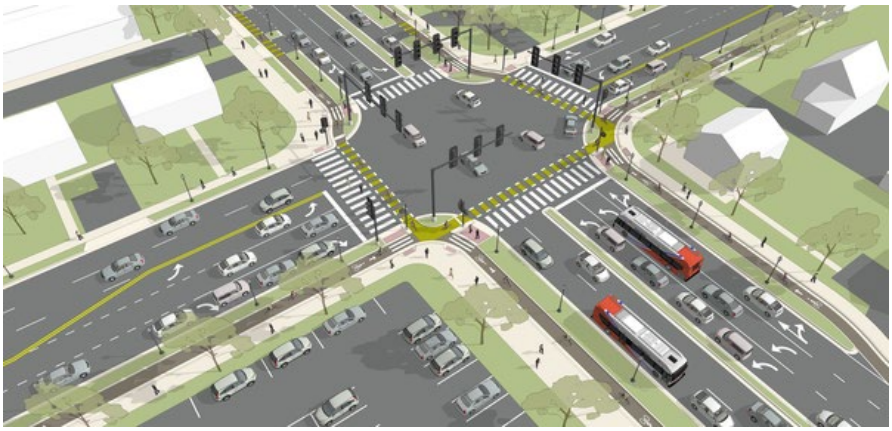
| Protected Intersection Element | Design Outcome |
|---|---|
| Bicycle lane extension through intersections (see "A" in Figure 20b) | Improve bicyclist and pedestrian visibility to turning drivers |
| Bicycle signals and signal phasing, including Leading Bicycle/Pedestrian Interval (LBI/LPI) | Improve bicyclist and pedestrian visibility to turning drivers<br>Separate modal movements in time by giving bicyclists and pedestrians a "head start" when the signal turns green |
| Curb extensions and curb radius reductions (see "B" in Figure 20b) | Shorten crossing distance for bicyclist and pedestrians<br>Improve bicyclist and pedestrian visibility to turning drivers<br>Reduce vehicle speeds |
| Two-stage bicycle turn box (see "C" in Figure 20b) | Simplify left-turn movement and reduce conflicts between bicyclists and motor vehicles |
| High visibility crosswalk markings (see "D" in Figure 20b) | Improve crossing conspicuity |
| No Turn on Red signs | Eliminate conflicts between turning motor vehicles and pedestrians/bicyclists |

### What are some considerations for use?

Protected intersection elements are applicable at both signalized and unsignalized intersections. Some elements are eligible for HSIP funding:

- S21PB: Leading pedestrian intervals
- R33PB: Install separated bicycle lanes (if bicycle lanes do not already exist in the location)

Figure 20: Example Protected Intersections



(a) Concept Visualization




(b) Paseo Padre Parkway/Walnut Avenue, Fremont, California.

Source: Kittelson & Associates, Inc; Google Earth

# UNSIGNALIZED INTERSECTIONS

This section presents recommended engineering countermeasures at unsignalized intersections in Dublin.

Table 2: Summary of Unsignalized Intersection Countermeasures and Related Information

| Countermeasure Name | CM ID* | Documented Crash Reduction Factor** | Federal Funding Eligibility through HSIP*** | Cost Estimate[t] | Emphasis Area | Page Reference |
|---|---|---|---|---|---|---|
| Add intersection lighting | NS01 | 40% | 100% | $ | Nighttime Safety | 3 |
| Create directional median openings to allow (and restrict) left-turns and u-turns | NS15 | 50% | 90% | $ - $$ | Pedestrian Crashes | 9 |
| Install painted safety zone | N/A | N/A | N/A | $ | Pedestrian Crashes, Signalized Local/Arterial Intersections | 20 |
| Install raised medians (refuge islands) | NS19PB | 45% | 90% | $ | Pedestrian Crashes | 24 |
| Install pedestrian crossing at uncontrolled locations | Varies. See page references. | Varies. See page references. | Varies. See page references. | $ - $$$ | Varies. See page references. | 25 |
| Non-Signalized Intersection Conspicuity Treatments | Varies. See page references. | Varies. See page references. | Varies. See page references. | $ - $$$ | Varies. See page references. | 26 |
| Install transverse rumble strips on approaches | NS10 | 20% | 90% | $ | Driver Behavior | 29 |
| Install splitter islands on the minor road approaches | NS13 | 40% | 90% | $ | Driver Behavior | 30 |

*CM ID refers to the Countermeasure ID from the Caltrans *Local Roadway Safety Manual (April 2020).*

**Documented crash reduction factors are derived either from the Caltrans *Local Roadway Safety Manual April 2020) or the* FHWA's *Proved Safety Countermeasures* resource, unless otherwise noted.

***Funding eligibility indicates the designated federal contribution level for approved HSIP projects in California associated with Caltrans HSIP Cycle 9. This is subject to change from one cycle to the next and should be confirmed with the state HSIP coordinator.

ŧ $ - $50,000 or less; $$ - $50,000 to $100,000; $$$ - $100,000 or more

## Install Raised Medians (Refuge Islands)

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian & Bicycle | Pedestrian Crashes | 45% | 100% | $ | Y |

### What is it?

A pedestrian refuge island is a median with a refuge area that is intended to help protect pedestrians who are crossing the roadway. A refuge island allows the pedestrians to focus on identifying adequate gap in traffic for one direction at a time. This treatment reduces the crossing distance for pedestrians and creates a place for refuge to allow multiple-stage crossings. Refuge island positions pedestrians in the sightline of drivers approaching the intersection. This treatment could also be used as a retrofit opportunity for roads that have medians that do not provide an adequate refuge.

### What are some considerations for use?

Per the FHWA *Field Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations*, refuge islands may be considered under the following roadway conditions: [1]

- Any ADT + 2 or 3 lanes (without a raised median) + any posted speed limit
- ADT ≥ 9,000 + 4 or more lanes (without a raised median) + any posted speed limit
- Any ADT + 4 or more lanes (without a raised median) + ≥ 35 mph posted speed limit

This treatment may be considered at locations with inadequate conspicuity/visibility of the crosswalk and/or crossing pedestrian, excessive vehicle speed, or lack of pedestrian separation from traffic during long crossings.

Figure 21. Example of Pedestrian Refuge Island



Source: NACTO

Figure 22. Example of Median (not a Refuge Island)



*Source: Naples News*

[1] Source: Field Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations (dot.gov)

## Install Pedestrian Crossing at Uncontrolled Locations

| Countermeasure | Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|---|
| Signs and markings only | Pedestrian & Bicycle | Pedestrian Crashes | 25% | 100% | $ | Y |
| With enhanced safety features | Pedestrian & Bicycle | Pedestrian Crashes | 35% | 100% | $ - $$$ | Y |

### What is it?

**Signs and markings only**—Pavement markings delineate a portion of the roadway that is designated for pedestrian crossing. These markings will often be different for controlled versus uncontrolled locations. The use of high-visibility crossing patterns ("ladder" or "zebra" style) at uncontrolled crossings can increase both pedestrian and driver awareness to the increased exposure at the crossing.

**With enhanced safety features**—Enhanced safety features include flashing beacons, curb extensions, advanced "stop" or "yield" markings, and other safety features.

- **Flashing beacons** are added at crossings under the pedestrian sign. When a pedestrian crosses the street, the lights flash, alerting drivers to yield before the intersection.
- **Curb extensions** are an extension of the sidewalk zone or curb line into the roadway zone at intersections. Curb extensions are intended to increase safety, calm motorized traffic, and create additional space for pedestrians and the boulevard and furnishing zone.
- **Advance yield/stop line** include the stop bar or "sharks teeth" yield markings placed 20 to 50 feet in advance of a marked crosswalk to indicate where vehicles are required to stop.

### What are some considerations for use?

Both these treatments should be used at non-signalized intersections without a marked crossing, where pedestrians are known to be crossing intersections that involve significant vehicular traffic. They are especially important at school crossings and intersections with right and/or left turns pockets.

Figure 23. Example of a High Visibility Pedestrian Crossing



Source: NACTO

Figure 24. Example of a Curb Extensions and Advanced Stop Bar



Source: Move Culver City

# CONSPICUITY TREATMENTS

| Countermeasure | Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|---|
| Install/upgrade larger or additional stop signs or other intersection warning or regulatory signs | Rear-end, right-angle, or turning crashes related to lack of driver awareness | Driver Behavior | 15% | 100% | $ | Y |
| Upgrade intersection pavement markings | Rear-end, right-angle, or turning crashes related to lack of driver awareness | Driver Behavior | 25% | 100% | $ | Y |
| Install Pedestrian Signal or Pedestrian Hybrid Beacon | Pedestrian and Bicycle | Pedestrian Crashes | 55% | 100% | $$$ | N |

## Install/Upgrade Larger or Additional Stop Signs or Other Intersection Warning/Regulatory Signs

### What is it?

Installing larger warning or regulatory signs at or in advance of an intersection can increase the visibility of the intersection, thereby increasing the ability of approaching drivers to perceive the intersection. The effectiveness of this strategy is greatest when implementation involves a combination of regulatory and warning signs appropriate for the conditions on an unsignalized intersection approach.

### What are some considerations for use?

Signs should be used at approaches to unsignalized intersections with patterns of rear-end, right-angle, or turning crashes related to lack of driver awareness of the presence of the intersection. A key to success in applying this strategy is to select a combination of regulatory and warning sign techniques appropriate for the conditions on a particular unsignalized intersection approach.

Figure 25. Example of Warning Signs



Source: ITE

## Upgrade Intersection Pavement Markings

### What is it?

Upgrades to intersection pavement markings include "Stop Ahead" markings and the addition of centerlines and stop bars for stop-controlled approaches. Providing visible stop bars and clearer delineation of lanes on minor road approaches to unsignalized intersections can help direct the attention of drivers to the presence of the intersection.

### What are some considerations for use?

Upgraded intersection pavement markings should be used at unsignalized intersections that are not clearly visible to approaching motorists, particularly approaching motorists on the major road. The strategy is particularly appropriate for intersections with patterns of rear-end, right-angle, or turning crashes related to lack of driver awareness of the presence of the intersection. They are also effective at minor road approaches where conditions allow the stop bar to be seen by an approaching driver at a significant distance from the intersection.

Figure 26. Example of Upgraded Intersection Pavement Markings




Source: City of San Antonio Public Works Department

## Install Pedestrian Signal (Including Pedestrian Hybrid Beacon [HAWK])

### What is it?

A Pedestrian Hybrid Beacon (PHB) is a hybrid beacon used to control traffic and reverts to all dark until a pedestrian activates it via a push button or other form of detection. When activated, the beacon displays a sequence of flashing and solid lights that indicate when vehicles must stop and when pedestrians should cross. PHBs provide active warning to drivers when a pedestrian is in the crosswalk. PHBs have been shown to significantly increase driver yielding behavior at uncontrolled crosswalks, with motorist yielding rates exceeding 90% (FHWA, 2014).

### What are some considerations for use?

Pedestrian Hybrid Beacons may be considered at locations with long pedestrian delay due to few available gaps in traffic, drivers not yielding to pedestrians in crosswalks, or noted conflicts at crossing locations.

Figure 27. Example of Pedestrian Hybrid Beacon




Source: FHWA

## Install Transverse Rumble Strips or Optical Speed Bars on Approaches

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| All | Driver Behavior | 20%[1] | 90%[1] | $[1] | Y |

1: Information presented relates to transverse rumble strips.

### What is it?

Transverse rumble strips are installed in the travel lane for the purposes of providing an auditory and tactile sensation for each motorist approaching the intersection. They can be used at any stop or yield approach intersection, often in combination with advance signing to warn of the intersection ahead.

Optical speed bars are transverse bars are spaced progressively closer together at an increasing rate as the driver travels along the roadway. The intent is that the reduced spacing gives the driver the perception of acceleration, causing the driver to slow down.

### What are some considerations for use?

Transverse rumble strips may generate noise generated by vehicles driving over them, so care must be taken to minimize disruption to nearby residences and businesses.

Figure 28. Example of Transverse Rumble Strips



Source: Vision Zero North Dakota

Figure 29. Example of Optical Speed Bars



Source: Speed Reduction Mitigation Strategies on Rural Highways at Two-Way Stop Control Intersections and Curves

## Install Splitter Islands on the Minor Road Approaches

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Broadside, Rear-end | Driver Behavior | 40% | 90% | $ | N |

### What is it?

This treatment consists of adding a raised median island at minor street intersection approaches. Raised splitter islands create a physical separation between vehicles turning onto the stop-controlled approach and vehicles stopped on that same approach. The splitter island also increases the visibility of the intersection, clarifies movements at the intersection, and provides a space for a secondary stop sign on the approach, if desired.

### What are some considerations for use?

Splitter islands may be considered when high frequencies of crashes are related to conflicting movements resulting from movements onto or off minor street approaches. Splitter islands should also be designed to accommodate appropriate design vehicles while still being large enough to be visible to drivers and provide a refuge area for crossing pedestrians.

Figure 30. Example of Splitter Island on Minor Road Approach




Source: FHWA

# ROADWAYS

This section presents recommended engineering countermeasures along roadways in Dublin.

Table 3: Summary of Roadway Intersection Countermeasures and Related Information

| Countermeasure Name | CM ID* | Documented Crash Reduction Factor | Federal Funding Eligibility through HSIP*** | Cost Estimate | Emphasis Area | Page Reference |
|---|---|---|---|---|---|---|
| Add lighting | R01 | 35% | 100% | $ | Nighttime Safety | 32 |
| Road diet (Reduce travel lanes from 4 to 3 and add a two way left-turn and bike lanes) | R14 | 30% | 90% | $ | Pedestrian Crashes | 32 |
| Corridor access management[1] | N/A | Varies. | N/A | $ - $$$ | Pedestrian Crashes | 34 |
| Install edgeline rumble strips/stripes | R31 | 15% | 100% | $-$$$ | Driver Behavior | 35 |
| Install separated bike lanes | R33PB | 45% | 90% | $ - $$ | Bicycle Crashes | 36 |
| Crosswalk visibility enhancements | Varies. See page reference. | Varies. See page reference. | Varies. See page reference. | $ - $$$ | Varies. See page reference. | 37 |
| Roadway/intersection approach conspicuity treatments | Varies. See page reference. | Varies. See page reference. | Varies. See page reference. | $ - $$ | Driver Behavior | 39 |
| Speed management treatments[1] | Varies. See page reference. | Varies. See page reference. | Varies. See page reference. | $ | Driver Behavior | 42 |

[1]Countermeasure not included in LRSM.

*CM ID refers to the Countermeasure ID from the Caltrans *Local Roadway Safety Manual (April 2020).*

**Documented crash reduction factors are derived either from the Caltrans *Local Roadway Safety Manual April 2020) or the* FHWA's *Proved Safety Countermeasures* resource, unless otherwise noted.

***Funding eligibility indicates the designated federal contribution level for approved HSIP projects in California associated with Caltrans HSIP Cycle 9. This is subject to change from one cycle to the next and should be confirmed with the state HSIP coordinator.

## Add Segment Lighting

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Nighttime | Nighttime Safety | 35% | 100% | $ | Y |

### What is it?

Providing roadway lighting improves the safety during nighttime conditions by (1) making drivers more aware of the surroundings, which improves drivers' perception-reaction times, (2) enhancing drivers' available sight distances to perceive roadway characteristic in advance of the change, and (3) improving non-motorist's visibility and navigation. Segment lighting improvements may be considered at segments with patterns of rear-end, right-angle, turning or roadway departure crashes on the roadways may indicate that night-time drivers can be unaware of the roadway characteristics.

### What are some considerations for use?

These treatments may be considered at locations with substantial patterns of nighttime crashes. Patterns of rear-end, right-angle, turning or roadway departure collisions on the roadways may indicate that night-time drivers can be unaware of the roadway characteristics.

Figure 31. Example of Roadway Segment Lighting



Source: Pensacola Voice

## Road Diet

(reduce travel lanes from 4 to 3 and add a two way left-turn and bike lanes)

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Head-on, Hit object, Unsafe Speed | Pedestrian Crashes | 30% | 90% | $ | N |

### What is it?

Road diets reduce the number of travel lanes on the roadway and provide space to implement pedestrian and bicyclist related treatments including adding bike lanes, and median crossing islands. The most common road diet configuration involves converting a four-lane roadway into three travel lanes (with one lane in each direction and a two-way left-turn lane), often supplemented with bike lanes. Figure 12 shows an example of road diet, i.e., reconfiguration of the roadway. Road Diets are intended to improve access management, increase pedestrian and bicyclist access, and enhance roadway safety.

### What are some considerations for use?

Road diets may be considered for application at priority pedestrian and bicycle routes or in urban and suburban areas with multilane roadways.

This treatment may be considered when any of the following factors are observed on site:

- Presence of left-turning conflicts between bicyclists and motor vehicles; or
- Desire to better accommodate pedestrian and bicycle travel.

Figure 32. Example of Road-Diet (Roadway Cross-Section Before and After Reconfiguration)



Source: Victoria Transport Policy Institute

## Corridor Access Management

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian and Bicycle, All | Pedestrian Crashes | Varies. | N/A | $ - $$$ | Y |

### What is it?

Access management refers to the design, application, and control of entry and exit points along a roadway. This includes intersections with other roads and driveways that serve adjacent properties. Thoughtful access management along a corridor can simultaneously enhance safety for all modes, facilitate walking and biking, and reduce trip delay and congestion.

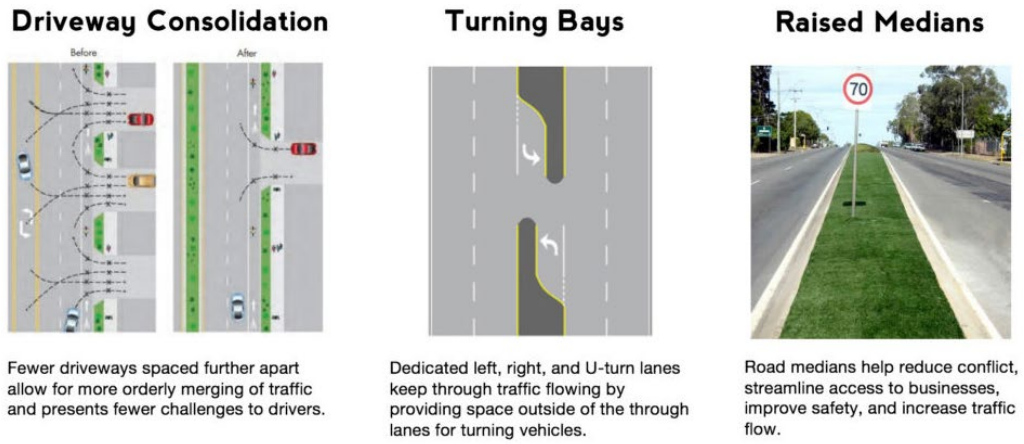
The following access management strategies can be used individually or in combination with one another:

- Reduce density through driveway closure, consolidation, or relocation.
- Manage spacing of intersection and access points. Limit allowable movements at driveways (such as right-in/ right-out only).
- Place driveways on an intersection approach corner rather than a receiving corner, which is expected to have fewer total crashes.
- Implement raised medians that preclude across-roadway movements.
- Utilize designs such as roundabouts or reduced left-turn conflicts (such as restricted crossing U-turn, median U-turns, etc.).
- Provide turn lanes (i.e., left-only, right-only, or interior two-way left).
- Use lower speed one-way or two-way off-arterial circulation roads.

### What are some considerations for use?

Successful corridor access management involves balancing overall safety and mobility for all users along with the needs of adjacent land uses.

Figure 33. Access Management Strategies.




Source: FHWA

## Install Edgeline Rumble Strips/Stripes

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Run-off Road, Hit Object | Driver Behavior | 15% | 100% | $ - $$$ | Y |

### What is it?

Edgeline rumble strips alert drivers that are drifting out of their travel lane before they depart the roadway, providing the driver time to correct and stay in their lane. The Caltrans Local Roadway Safety Manual recommends installing rumble strips along an entire corridor, instead of just in certain spots. Rumble stripes –so called when the pavement marking is in the rumble strip—provide enhanced marking in wet or dark conditions.

### What are some considerations for use?

Edgeline rumble strips may have special requirements when installing in locations with residential land uses related to noise. If bicyclists are expected to ride in proximity of the edgeline, stripes should be used to provide for bicyclist comfort and safety.

Figure 34. Example of Edgeline Rumble Strips



Source: FHWA

## Install Separated Bike Lanes

| Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|
| Pedestrian, Bicycle | Driver Behavior | 45% | 90% | $ - $$ | Y |

### What is it?

Separated bike lanes can range from painted buffers and flexible delineators to raised curbs, grade separation, and parking lanes. Separated bike lanes are the most appropriate in urban and suburban areas, on roadways with high volumes of bicycle traffic, or where a high number of bike-vehicle collisions have occurred.

### What are some considerations for use?

The cost of the treatment can be low to high, depending on whether roadway widening, right of way, or environmental impacts are involved. Treatments should also include signage and markings directing cyclists to appropriate paths, and for motorized users to be aware of where bicyclists are traveling.

Figure 35. Example of Separated Bike Lane



Source: Kittelson & Associates, Inc.

# CROSSWALK VISIBILITY ENHANCEMENTS

| Countermeasure | Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|---|
| Install/upgrade pedestrian crossing (with enhanced safety features) | Pedestrian and Bicycle | Pedestrian Crashes | 35% | 100% | $$ - $$$ | Y |
| Install raised pedestrian crossing | Pedestrian and Bicycle | Pedestrian Crashes | 35% | 90% | $ | Y |

## Install/Upgrade Pedestrian Crossing (with Enhanced Safety Features)

### What is it?

This treatment should be used at roadway segments with no controlled crossing for a significant distance in high-use midblock crossing areas and/or multi-lane roads locations. Adding pedestrian crossings has the opportunity to greatly enhance pedestrian safety. The enhanced safety elements, which may include curb extensions, medians and pedestrian crossing islands, beacons, and lighting, combined with pavement markings delineating a portion of the roadway that is designated for pedestrian crossing.

### What are some considerations for use?

When installing or upgrading a pedestrian crossing with enhanced safety features, care must be taken to warn drivers of the potential for pedestrians crossing the roadway and enhanced improvements added to the crossing increase the likelihood of pedestrians crossing in a safe manner. In combination with this CM, better guidance signs and markings for non-motorized and motorized roadway users should be considered, including sign and markings directing pedestrians and cyclists on appropriate/legal travel paths and signs.

Figure 36. Example of Enhanced Mid-Block Crossing



Source: NACTO

## Install Raised Pedestrian Crossing

### What is it?

Raised crossings are a vertical traffic control measure that can reduce vehicle speeds, improve pedestrian visibility to approaching drivers, and improve pedestrian and bicyclist crossing safety by improving drivers yielding. The raised crossing encourages drivers to reduce their speed and provides improved delineation for the portion of the roadway that is designated for pedestrian crossing. Signs and markings directing pedestrians and cyclists on appropriate travel paths should be used in combination with this countermeasure.

### What are some considerations for use?

In combination with installing a raised pedestrian crossing, better guidance signs and markings for non-motorized and motorized roadway users should be considered, including sign and markings directing pedestrians and cyclists on appropriate/legal travel paths.

Figure 37. Example of Raised Pedestrian Crossing



Source: PedBikeSafe

# ROADWAY DEPARTURE TREATMENTS

| Countermeasure | Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|---|
| Remove or relocate fixed objects outside of Clear Recovery Zone | Hit Object | Driver Behavior | 35% | 90% | $ - $$ | Y |
| Install delineators, reflectors and/or object marker | All | Driver Behavior | 15% | 100% | $ | Y |
| Install/upgrade signs with new fluorescent sheeting (regulatory or warning) | Head-on, Run-off Road, Sideswipe, Night | Nighttime Safety, Driver Behavior | 15% | 100% | $ | Y |

## Remove or Relocate Fixed Objects Outside of Clear Recovery Zone

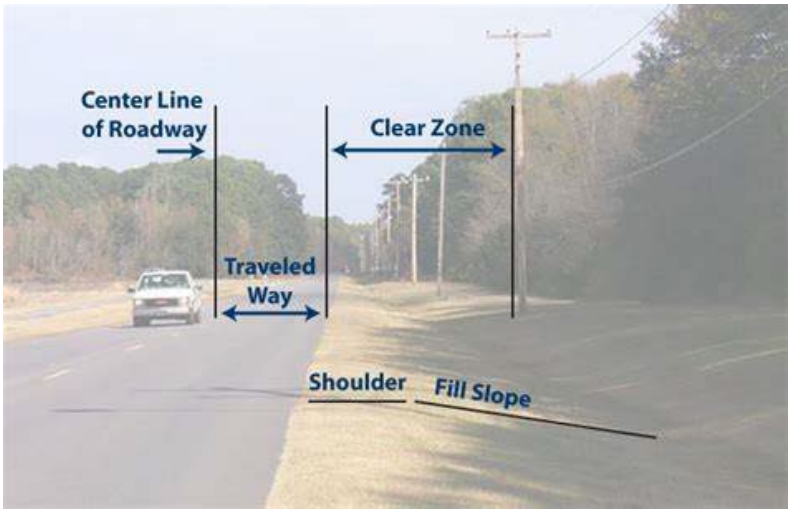
### What is it?

Removing or relocating roadside fixed objects such as utility poles, drainage, trees, or other fixed objects provides a clear recovery zone that allows drivers to correct their path of travel when they leave the roadway. This treatment is particularly effective outside of curves, along lane drops and in traffic islands where fixed object crashes are more common. A clear recovery zone should be developed on more rural context roadways, as space is available.

### What are some considerations for use?

A clear recovery zone should be developed on every roadway, as space is available. In situations where public right-of-way is limited, steps should be taken to request assistance from property owners, as appropriate.

Figure 38. Example of Clear Recovery Zone




Source: United States Army

## Install Delineators, Reflectors and/or Object Marker

### What is it?

This treatment consists of adding delineators, reflectors, or object markers on the approach and through a horizontal curve. Delineators, reflectors, and object markers provide drivers with a visual cue of the approaching horizontal curve and help drivers navigate safely through the curve.

### What are some considerations for use?

Delineators, reflectors and object markers may be considered at any horizontal curve where visibility of the approaching curve is limited or providing guidance through the curve via delineation may provide safety benefits. These treatments may be considered when high frequencies of run-off-road crashes related to a horizontal curve are identified.

Figure 39. Example of Roadside Delineators



Source: Pathmark Traffic Products

# Install/Upgrade Signs with New Fluorescent Sheeting (Regulatory or Warning)

## What is it?

Installing and/or or upgrading signs with fluorescent sheeting provides drivers with a visual warning of the presence of a specific roadway feature or regulatory requirement that they may have missed with existing signs. This treatment is appropriate on roadway segments with a history of head-on, nighttime, non-intersection, run-off road, and sideswipe crashes.

## What are some considerations for use?

New fluorescent sheeting should be installed in combination with additional treatments such as installing or adding chevrons, warning signs, delineators, markers, beacons, and relocating existing signs.

Figure 40. Example of Fluorescent Sign



Source: 3M

# SPEED MANAGEMENT TREATMENTS

| Countermeasure | Crash Types Addressed | Emphasis Areas Addressed | Documented Crash Reduction Factor | Federal Funding Eligibility | Cost Estimate | Ideal for Systemic Application? |
|---|---|---|---|---|---|---|
| Install dynamic speed warning signs | All | Driver Behavior | 30% | 100% | $ | Y |
| Variable speed limit | Winter crashes (October - March) | Driver Behavior | 31.6%[3] | N/A | N/A | N |
| Appropriate speed limit for all users | All | Pedestrian Crashes, Driver Behavior | Varies. | N/A | N/A | Y |

## Install Dynamic Speed Warning Signs

### What is it?

This treatment consists of installing dynamic speed feedback signs on the roadway. Speed feedback signs provide drivers with feedback about their speed in relationship to the posted speed limit.

### What are some considerations for use?

Dynamic speed warning signs may be considered on roadways that have higher incidence of crashes due to excessive speeds, and on relatively sharp curves.

Figure 41. Example of Dynamic Speed Warning Signs




Source: Radar Sign

## Appropriate Speed Limit for All Users

### What is it?

Posted speed limits are often the same as the legislative statutory speed limit. Agencies with designated authorities to set speed limits, which include States, and sometimes local jurisdictions, can establish non-statutory speed limits or designate reduced speed zones, and a growing number are doing so. Based on international experience and implementation in the United States, the use of 20 mph speed zones or speed limits in urban core areas where vulnerable users share the road environment with motorists may result in further safety benefits. California Assembly Bill 43, passed in 2021, allows local jurisdictions to reduce speed limits in key areas.

### What are some considerations for use?

When setting appropriate speed limits**,** agencies should consider a range of factors such as pedestrian and bicyclist activity, crash history, land use context, intersection spacing, driveway density, roadway geometry, roadside conditions, roadway functional classification, traffic volume, and observed speeds. To achieve desired speeds, agencies often implement other speed management strategies concurrently with setting speed limits, such as self-enforcing roadways, traffic calming, and speed safety cameras.

# APPENDIX D: STRATEGY TOOLBOX

# STRATEGY TOOLBOX

This section presents available non-engineering solutions to improve safety on local roadways in Dublin. The strategies require a champion either among, or in coordination with, City staff. The Local Roadway Safety Plan includes recommendations for how these strategies may be implemented, in recognition that

## EDUCATION STRATEGIES

To build a culture of safety, the public must have access to traffic safety information. Public education and collaboration help bridge gaps in knowledge that influence roadway user behavior. The following strategies provide opportunities to educate and learn from the community:

### EDUCATION CAMPAIGNS

Roadway safety education programs help people develop safer driving habits, learn how to take alternative modes of transportation, and have a deeper understanding of municipal laws.

Key topics for education programs include:

- Roadway safety for children
- Young driver safety
- Vulnerable roadway user safety
- Dangers of impaired driving
- Dangers of distracted driving (e.g., using cell phones and text messaging while driving)

Several organizations offer specialized educational training programs:

- American Association of Retired Persons (AARP) resources and courses: https://www.aarp.org/auto/driver-safety/
- CarFit program sponsored by American Automobile Association (AAA), AARP, and the American Occupational Therapy Association (AOTA): https://www.car-fit.org/

**Potential partners**: Dublin Unified School District, California Department of Motor Vehicles, Alameda County Department of Public Health, local community organizations (e.g., Bike East Bay, Community for Independent Living), City of Dublin Public Information Office, Dublin Police Services

# TRANSPORTATION SAFETY CAMPAIGN

Designed to dovetail with community education efforts, transportation safety campaigns use strategic marketing, advertising, and engagement to foster community awareness of a shared responsibility for roadway safety. Successful messaging reaches audiences using a variety of approaches. Campaigns should be created in partnership with various community stakeholders, including other planning organizations and jurisdictions.

This section presents ideas for a Dublin transportation safety campaign that can be tailored to accommodate limited staff, resources, and budget.

## Campaign Tools

**Branding**: A logo, font standards, and color palette help create a recognizable brand for print and digital products. The City of Dublin already has well established brand standards.

**Social Media Strategy & Schedule**: A social media campaign is a great way to reach target audiences. Different demographics use different platforms, so careful implementation can help agencies reach new groups. Social media strategy should use graphics, text, and a post release schedule to create a storyline that Dublin residents can follow and participate in.

**Multimedia:** Strong campaigns engage audiences through many types of media and events.

- **Print**—Campaign events should have ready-to-share print materials to engage interested stakeholders who may not have time to stick around and learn more.
- **Radio and Video**—Radio and video spots can help spread the word about a safety campaign.
- **School Resources**—School-based programs can help teach young people that their actions as roadway users have consequences that impact others.

## Safety Messaging

Safety messages and infographics on posters and in social media can be tailored to identified safety emphasis areas. These messages link behavioral elements to safety performance trends and educate drivers to be alert and aware to help reduce these collision types. Each safety message should come with a supporting statistic that underscores why this safety message is important, and the larger campaign should provide a timeframe for when to publicize each safety message. This plan provides the supporting statistics that could be used in a campaign.

Figure 1: Example Safety Communications Graphic Developed for Tigard, Oregon



## Implementation and Partnerships

Successful campaigns use supportive partnerships with jurisdictions, organizations, and individuals to share the messages throughout the community. Partnerships can help ensure campaign branding, tone, and materials clearly and correctly communicate safety messaging.

**Potential partners:** Dublin Unified School District, California Department of Motor Vehicles, Alameda County Department of Public Health, local active transportation organizations, Department of Public Information

# EQUITABLE ENFORCEMENT STRATEGIES

Even with engineering countermeasures in place, road users can fail to obey traffic laws and cause crashes of varying severity. Police enforcement has been traditionally used as a strategy to increase driver awareness, educate drivers on roadway violations, and reduce traffic crashes.

However, if enforcement strategies are to improve overall safety in a community, traffic laws must be applied equitably. Directed enforcement strategies should be undertaken with due caution to avoid inequitable enforcement activities and be rigorously evaluated to determine the strategy's intent and impact.

Dublin Police Services leadership has diligently worked to ensure members of the organization demonstrate a commitment to modeling practices that are contemporary and at the forefront of the policing profession and traffic enforcement operations.

Dublin Police Services recognizes and fully embraces equity and prioritizes all traffic safety concepts and efforts for people or communities that have been marginalized by poverty and discrimination.

## SPEED MONITORING TRAILERS

Speed monitoring devices can be used to improve road user behavior and decisions. This strategy was chosen due its applicability to the safety emphasis areas of driver behavior, particularly aggressive driving.

Portable speed trailers visually display a driver's real-time speed compared to the speed limit and may be effective at reducing speeds and increasing awareness of local speed limits. Portable speed trailers are also deployed to areas of Dublin that warrant traffic calming measures. These devices are most effective when the trailer flashes "SLOW DOWN" or flashes a bright white light that mimics a photo speed camera or a blue and red light that mimics a police car when drivers are moving too fast. In some cases, back-up speed enforcement by officers may be needed when radar speed trailers are used.

**Potential partners**: Dublin Police Services and local community organizations

Figure 2: Example Speed Monitoring Trailer




Source: PEDSAFE

## PROGRESSIVE TICKETING

Progressive ticketing can be used to improve road user behavior and decision-making. This strategy was chosen due its applicability to the safety emphasis areas of driver behavior, particularly aggressive driving.

Issuing tickets has traditionally been used as the strongest strategy of an enforcement program and is usually reserved for changing unsafe behaviors that other strategies failed to change or that pose a real threat to road user safety. There are three main steps in an effective progressive ticketing program:

1. **Education**—Establish community awareness of the problem. The public needs to understand drivers are speeding and the consequences of this speeding for road safety. Raising awareness about the problem will change some behaviors and create public support for the enforcement efforts to follow. This is done through proactive enforcement initiatives.
2. **Warning**—Announce what action will be taken and why. It is common practice to allow the public time to change behaviors before ticketing starts. Fliers, signs, newspaper stories and official warnings from officers can all serve as reminders.
3. **Ticketing**—After the warning period, if offenders continue their unsafe behaviors, officers issue tickets.

It is inevitable that these enforcement initiatives increase interactions between law enforcement officers and community residents. Dublin Police Services is aware of the impact these interactions could have on community members experiencing poverty and discrimination and recognizes those sensitive circumstances and addresses them with the utmost professionalism.

**Potential partners**: Dublin Police Services, City of Dublin, and Department of Public Information Office

## SPEED ENFORCEMENT IN SCHOOL ZONES

Speed enforcement in school zones can be used to improve driver behavior and decision-making. This strategy was chosen due its applicability to the safety emphasis areas of driver behavior, particularly aggressive driving.

Strict enforcement of speed laws in school zones is one law enforcement tool that can improve safety for children walking and bicycling to school and drivers. Potential approaches include a zero-tolerance policy for speeders in school zones and an increase in fines for drivers who violate the posted school zone speed limit.

**Potential partners**: Dublin Police Services

## HIGH VISIBILITY SATURATION PATROLS

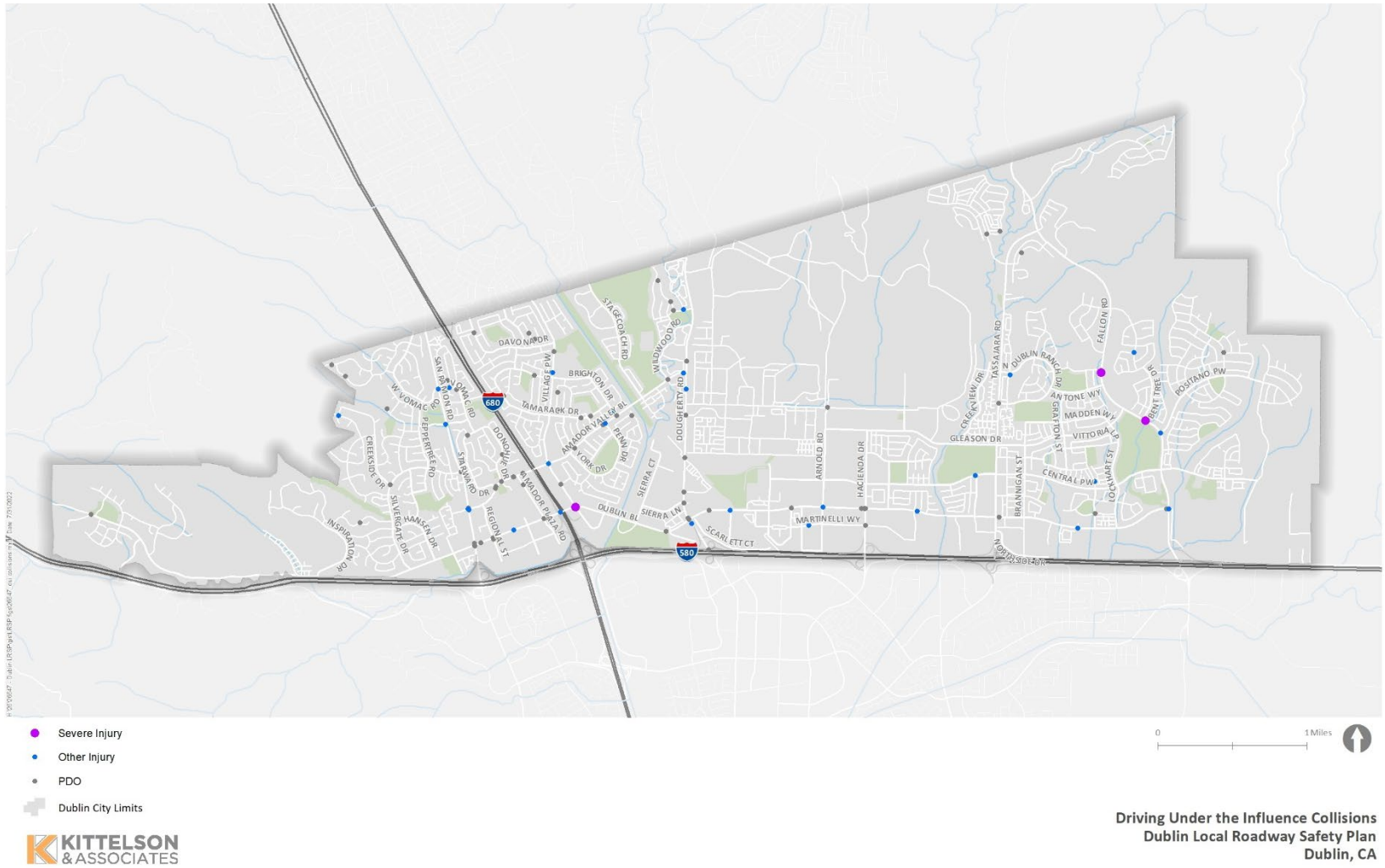
High visibility saturation patrols can be used to improve road user behavior and decision-making. This strategy was chosen due its applicability to the safety emphasis areas of driver behavior, particularly impaired driving.

A saturation patrol (also called a blanket patrol or dedicated driving while intoxicated (DWI) patrol) consists of many law enforcement officers patrolling a specific area, looking for drivers who may be impaired. These patrols usually take place at times and locations where impaired driving collisions commonly occur. Like publicized sobriety checkpoints, the primary purpose of publicized saturation patrols is to deter driving after drinking by increasing the perceived risk of arrest. The patrols can be paired with publicity around stepped-up enforcement efforts.

Figure 3 shows the location of Dublin collisions that involved the influence of drugs or alcohol.

**Potential partners**: Dublin Police Services, Department of Public Information Office

Figure 3: Driving Under the Influence Collisions



## COLLISION VS. CITATION EVALUATION PROGRAMS

It is important to evaluate enforcement actions and to center social equity in doing so. Collision vs. citation evaluation programs are joint efforts between local government agencies and law enforcement to monitor and document the effectiveness of increased enforcement in lowering traffic collision rates at intersections.

In Dublin, a collision vs. citation evaluation strategy can assess whether enforcement strategies are effective and equitable. Disaggregating and evaluating collision and citation data by race and ethnicity will help promote an equitable approach to community safety and well-being.

FHWA and the US Department of Justice provide online resources for establishing a collision vs. citation program as part of a data-driven approach to traffic safety.

For more, see https://www.ojp.gov/library/publications/data-driven-approaches-crime-and-traffic-safety-ddacts-operational-guidelines.

**Potential partner**: Dublin Police Services

# EVALUATING EDUCATION OR EQUITABLE ENFORCEMENT PROGRAMS

Quantifying campaign results can be difficult, but an execution and evaluation framework can help identify actions, recommendations, and opportunities for improvement. An evaluation framework will help track progress and aide future programs.

An evaluation framework can help capture how residents feel about a campaign, what resonated, and what opportunities for change exist. For example, the Fresno Council of Governments' transportation safety campaign *Safe Roads Save Lives* used a framework to help them understand whether audience behaviors changed, where the campaign was succeeding, and what aspects needed improvement (see Figure 4). Dublin could easily adapt this table to its programs.

Figure 4: Sample Evaluation Framework—Fresno's Safe Roads Save Lives Campaign

| Part of Campaign | Evaluation Metrics | Evaluation Methods |
|---|---|---|
| Branding | • Brand/Campaign Recognition<br>• Approval of Campaign Look/Style | • Intercept survey<br>• Online survey |
| Social Media Strategy | • Intercept survey<br>• Online survey | • Data counts<br>• Tracking of jurisdiction, organizational, or individual participation |
| Print Materials | • Number of materials produced<br>• Types of materials most requested<br>• Location of material distribution<br>• Language of materials requested | • Material inventory<br>• Location tracking |
| Radio and Video Resources | • Creation of materials<br>• Airtime | • Count of type of resource used<br>• Survey of type of media where the resource was shared (e.g., genre of radio station, television program, etc.) |
| School Resources | • Number of participating schools<br>• Types of resources used at each school | • School counts<br>• Annuals surveys of schools |
| Overall Campaign | • Behavior change | • Before/after collision data<br>• Survey of transportation stakeholders—law enforcement, jurisdictions, transportation advocates, etc.—on the efficacy of the campaign |

Fresno Council of Governments Regional Safety Plan (2021), retrieved from https://www.fresnocog.org/project/2021-regional-safety-plan-local-road-safety-plan/.

# EMERGENCY SERVICES

Whether a person survives a collision often depends on their access to medical care. Reaching a hospital within 60 minutes can significantly improve collision outcomes, and rural and remote areas or congestion can create additional delays for emergency response teams. Nearby hospitals (The San Ramon Regional Medical Center on Alcosta Bouelvard in San Ramon) (Stanford Health Care—ValleyCare on Santa Rita Road in Pleasanton) are regionally convenient but require of travel outside city limits.

The strategies in this section focus on partnerships with emergency medical services (EMS) that will improve regionwide response times and coordination by sharing real-time information.

## PARTNER WITH LOCAL HOSPITALS OR OUTREACH GROUPS

At the collision site, bystanders are often the first people who can offer help. This is especially true in rural or remote areas. Organized through partnerships with local hospitals and outreach groups, public bystander training courses can help reduce severity outcomes. These courses educate community members on safe ways to help at the scene of a collision and can help people feel more comfortable giving aid in an emergency.

**Potential partners:** Alameda County Department of Public Health, Alameda County Fire Department

## EMERGENCY SERVICES COORDINATION

Working with local hospitals and other stakeholders can help maximize efficiency with response times through evidence-based techniques, including

- Using registry data and EMS records to determine reasons for delay in transport for both ground and helicopter EMS
- Considering process improvement initiatives to increase EMS documentation and data collection
- Identifying equipment upgrades, training, or enhancements that would improve patient outcomes.

**Potential partners:** Alameda County Department of Public Health

## COUNTY 911 TEAM COLLABORATION

Working with the local 911 team during project planning and design activities will help identify opportunities to improve EMS access and location identification. The 911 team will be key partners for enforcement strategies, EMS grant opportunities, and efforts to develop or modify a system that allows County 911 dispatchers to input reported roadway issues and send the information to the appropriate agency (i.e., the City, County, or other jurisdiction).

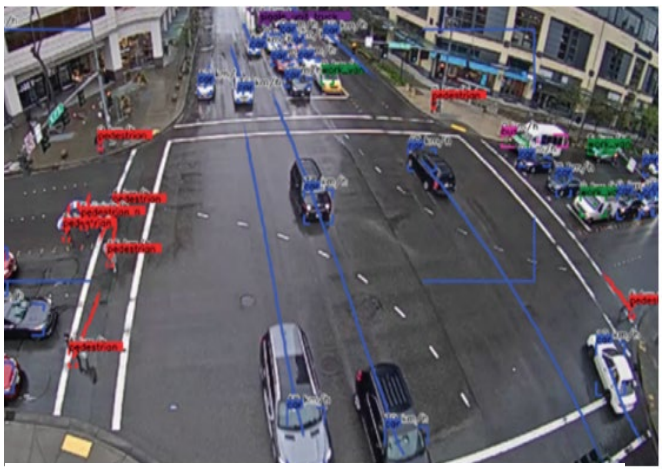
**Potential partners:** Alameda County Department of Public Health

# EMERGING TECHNOLOGIES

New traffic safety technology—like artificial intelligence and deep learning—can enhance the benefits of Dublin's other engineering, education, enforcement, and emergency services efforts.

## USE ARTIFICIAL INTELLIGENCE AND DEEP LEARNING

Artificial intelligence and deep learning on traffic video feeds (such as existing closed-circuit television, or CCTV, traffic cameras) can automatically analyze traffic flow for effective and immediate roadway safety diagnosis and conflict evaluation. Combining artificial intelligence and vehicle-to-everything (V2X) technology can predict vehicle and pedestrian intent and prevent conflicts that may result in collisions. Dublin could apply this technology to test effectiveness of countermeasures or to supplement collision data by identifying conflicts or near-misses on its roadways.



Video detection of road user trajectories can detect near-misses and conflicts. Photo source: National Operations Center of Excellence, https://bit.ly/3vuXfMG.

### Example Application

The City of Bellevue, Washington, used a video-based network-wide conflict analysis to support a community Vision Zero project. This work used large-scale network screening to analyze video data from traffic surveillance cameras. Software analyzed traffic volumes, speeds, and near-misses at 40 intersections with varied population densities and land use.

This project helped Bellevue understand what factors impact its transportation network's safety and leverage that information to select improvements and evaluate outcomes.[1]

[1] City of Bellevue (2020). Video-based Network-wide Conflict Analysis to Support Vision Zero in Bellevue (WA). Retrieved from https://safety.transoftsolutions.com/city-of-bellevue/.

## CROSSWALK MOTION SENSORS

Pedestrian user-friendly intelligent intersections, or PUFFIN crossings, are mid-block push-button applications used widely in the United Kingdom. PUFFIN crossings have a pedestrian signal and include sensors that detect pedestrians waiting to cross and within the crosswalk. Because the crosswalk detects crossing pedestrians, it can extend the signal to extend the phase if necessary. Studies in the United Kingdom showed pedestrian safety benefits with PUFFIN installation.[2] PUFFIN crossings may be useful at signalized crossings where older adults, children, or people with disabilities cross frequently. Tucson, Arizona, and Portland, Oregon, have implemented PUFFIN crossings that can extend the crossing phase. Alternative vendors exist that provide similar technological solutions.

More information about PUFFIN crossings, visit http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=55.

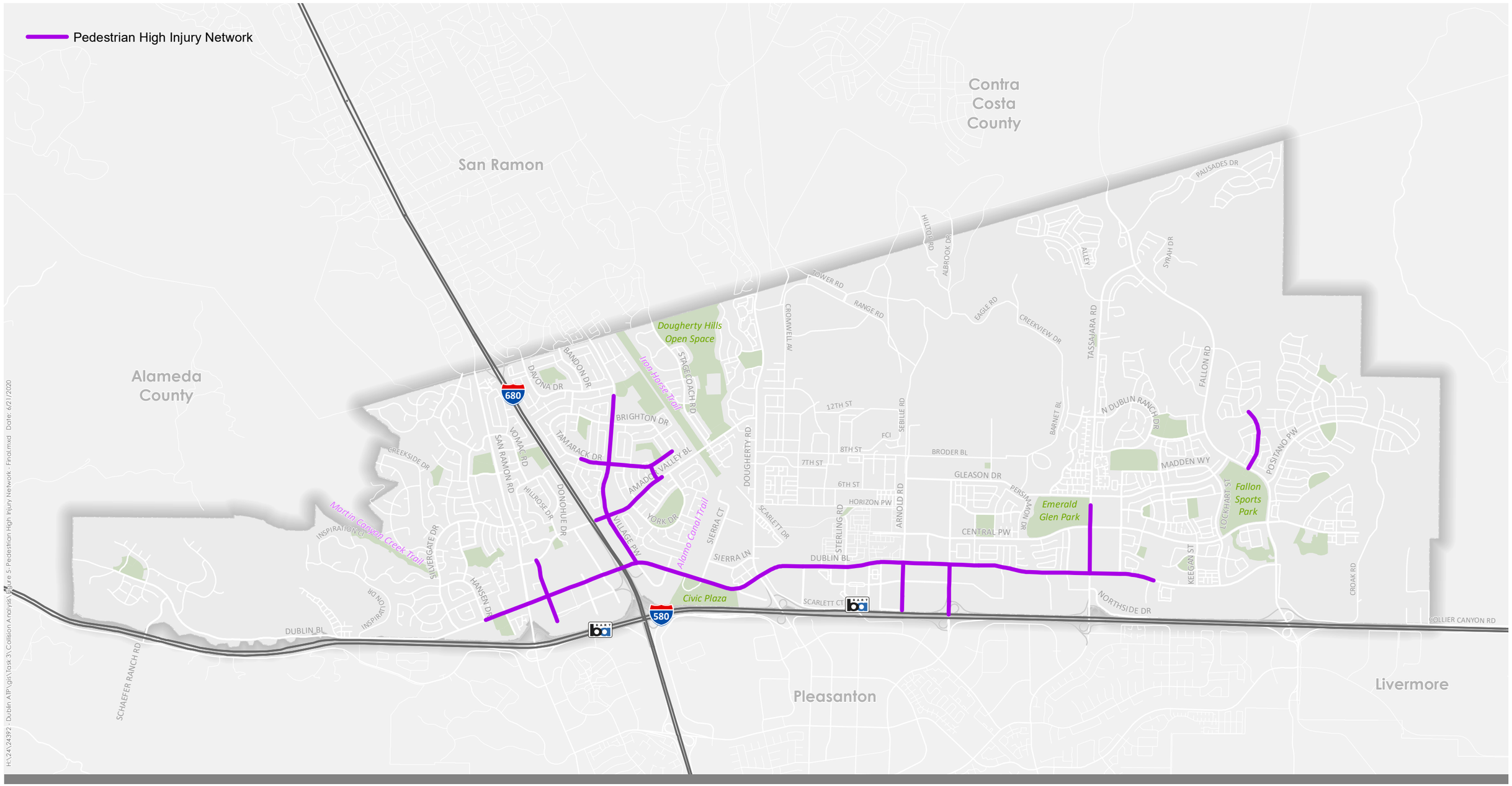


Pedestrian sensor at a signalized crossing.

[2] Maxwell, A. and J. Kennedy. Study Compares Accident Frequency at Puffins and Crossings Using Farside Facilities. Traffic Engineering and Control, Vol. 51, No. 8, 2010, 317–321.

# APPENDIX E:

# BICYCLE AND PEDESTRIAN HIGH INJURY NETWORKS



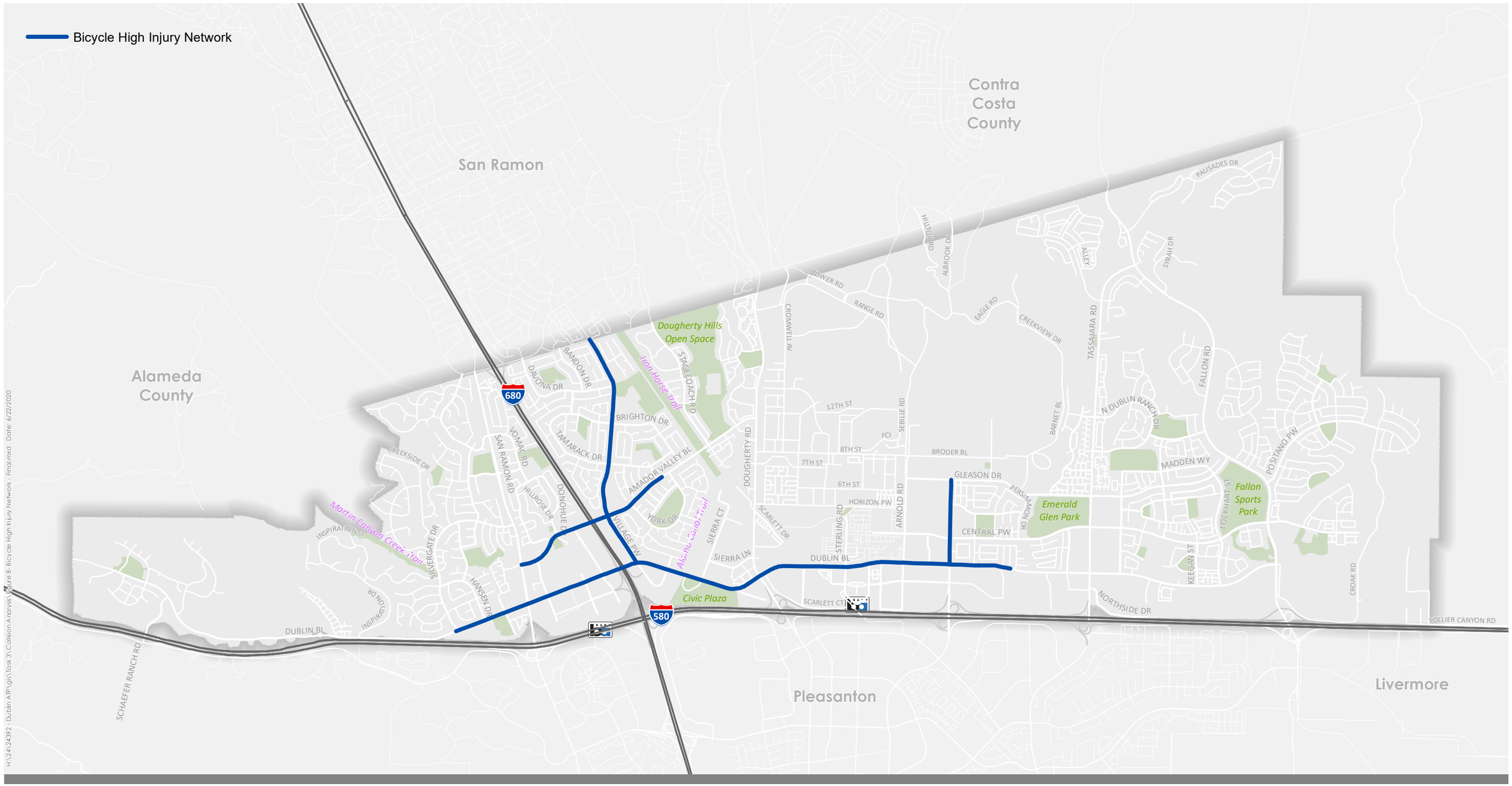

H:\24\24392 - Dublin ATP\gis\Task 3\Collision Analysis\Figure 5-Pedestrian High Injury Network - Final.mxd Date: 6/21/2020

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

Figure 5

**Pedestrian High Injury Network**
**Dublin, California**




DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

Figure 8

**Bicycle High Injury Network**
**Dublin, California**

# APPENDIX F: FUNDING

# FUNDING

Both Federal and State agencies offer funding for regional and local transportation projects, policies, and programs.

## FEDERAL FUNDING

### Congestion Management & Air Quality (CMAQ)

Federal Highway Administration (FHWA)

The Congestion Mitigation and Air Quality Improvement (CMAQ) program provides flexible funding for State and local governments' transportation projects and programs to meet the requirements of the Clean Air Act (CAA) and its amendments. CMAQ money supports transportation projects that reduce mobile source emissions in areas designated by the U.S. Environmental Protection Agency (EPA) to be in nonattainment or maintenance of the national ambient air quality standards. See MTC's One Bay Area Grant (OBAG) program for how CMAQ funding is distributed within the nine-county Bay Area. OBAG disburses federal funds in accordance with MTC's regional transportation priorities and associated land-use and housing goals.

https://www.transportation.gov/sustainability/climate/federal-programs-directory-congestion-mitigation-and-air-quality-cmaq

### Surface Transportation Block Grant (STBG) Program

FHWA

The Fixing America's Surface Transportation (FAST) Act converts the long-standing Surface Transportation Program (STP) into the Surface Transportation Block Grant Program (STBG). The STBG provides flexible funding address State and local transportation needs. Funding may be used to preserve and improve conditions and performance on the following: Federal-aid highway, bridge and tunnel projects on qualifying public roads; pedestrian and bicycle infrastructure; and transit capital projects, including intercity bus terminals. OBAG disburses federal funds in accordance with MTC's regional transportation priorities and associated land-use and housing goals.

https://www.fhwa.dot.gov/specialfunding/stp/

### Land and Water Conservation Fund (LWCF)

National Park Service

The LWCF matches grants for states and local governments to acquire and develop public outdoor recreation areas and facilities. The LWCF has provided more than $16.7 billion to state and local governments to acquire new federal recreation lands. Projects can include open space acquisition, small city and neighborhood park development, and trail or greenway construction.

https://www.nps.gov/subjects/lwcf/index.htm

## Rivers, Trails, and Conservation Assistance (RTCA) Program

National Park Service

The RTCA program supports community-led natural resource conservation and outdoor recreation projects nationwide. The National Park Service helps community groups, nonprofits, Tribes, and State and local governments design trails and parks, conserve and improve river access, protect special places, and create recreation opportunities.

https://www.nps.gov/orgs/rtca/index.htm

# OTHER FEDERAL GRANTS

Because the continued existence of these grant programs is at the discretion of Congress, research the current state of funding before considering these sources.

## Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant

United States Department of Transportation (USDOT)

The RAISE Discretionary Grant program provides a unique opportunity for USDOT to invest in roadway, rail, transit, and port projects that promise to achieve national objectives. Previously known as Better Utilizing Investments to Leverage Development (BUILD) and Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants, the eligibility requirements of RAISE allow project sponsors at the state and local levels to obtain funding for multimodal, multi-jurisdictional projects that are more difficult to support through traditional department of transportation programs.

https://www.transportation.gov/RAISEgrants

## Infrastructure for Rebuilding America (INFRA) Grant

USDOT

The INFRA Grants program funds transportation projects that focus on rebuilding existing infrastructure. To be eligible, projects must be on the National Highway System; a railway/highway grade separation project; a freight project that is rail or intermodal; or improve freight movement within an intermodal facility. Most governmental bodies (e.g., unit of local government, port authority, groups of jurisdictions) are eligible applicants. Minimum awards for large projects are $25 million and $5 million for small projects.

https://www.transportation.gov/grants/infra-grants-program

## Infrastructure Jobs and Investment Act (IIJA)

USDOT

The bipartisan IIJA provides the basis for FHWA programs and activities through September 30, 2026. The IIJA makes a once-in-a-generation investment of $350 billion in highway programs and includes the largest dedicated bridge investment since the construction of the Interstate Highway System. New programs under the law focus on rehabilitating bridges in critical need of repair, reducing carbon emissions, increasing system resilience, removing barriers to connecting communities, and improving mobility and access to economic

opportunity. Many of the new programs include eligibility for local governments, Metropolitan Planning Organizations (MPOs), Tribes, and other public authorities.

One program, the Safe Streets for All (SS4A) Grant Program, has appropriated $5 billion over the next five years, with up to $1 billion available in fiscal year 2022. Funding is available for the following activities:

- Comprehensive safety action plans
- Planning, design, and development activities in support of an Action Plan (like this LRSP)
- Projects and strategies identified in an Action Plan (like this LRSP)

More information on the Bipartisan Infrastructure Law is available at https://www.fhwa.dot.gov/bipartisan-infrastructure-law/. A list of examples of SS4A funding-eligible activities is available at https://www.transportation.gov/grants/SS4A.

# STATE FUNDING

## Senate Bill 1 (SB 1)

SB1, the Road Repair and Accountability Act of 2017, is a long-term transportation reform and funding package. The bill includes new revenues that address a variety of transportation projects, such as roadway safety improvements, street repair, transit, and roadway and bridge construction. SB 1 provides more than $5 billion annually to transportation projects throughout California.

http://rebuildingca.ca.gov/

## Highway Safety Improvement Program (HSIP)

Caltrans

The Highway Safety Improvement Program (HSIP) is one of the core federal-aid programs in the federal surface transportation act, Fixing America's Surface Transportation Act (FAST). HSIP aims to significantly reduce traffic fatalities and severe injuries on all public roads—including non-State-owned public roads and roads on Tribal land—by funding eligible projects such as crosswalk markings, rapid flashing beacons, curb extensions, speed feedback signs, guard rails, pedestrian refuge islands, slurry seal, and other pavement markings.

https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program

## Office of Traffic Safety (OTS) Grants

California Office of Traffic Safety

OTS strives to eliminate traffic deaths and injuries by granting funds to local and state public agencies for programs that enforce traffic laws, educate the public in traffic safety, and provide varied and effective means of reducing fatalities, injuries, and economic losses from collisions.

https://www.ots.ca.gov/grants/

## Active Transportation Program (ATP) Grants

California Transportation Commission (CTC)

The ATP consolidates existing federal and state transportation programs, including the Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SR2S), into a single discretionary grant program that focuses on making California a national leader in active transportation. The ATP aims to encourage active transportation by increasing the proportion of trips made by bicycle or on foot; increasing non-motorized user safety; reducing greenhouse gases; enhancing public health; and ensuring that disadvantaged communities share fully in program benefits.

https://catc.ca.gov/programs/active-transportation-program

## State-Local Partnership Program (LPP)

CTC

Created by the Road Repair and Accountability Act of 2017 through SB1, the Local Partnership Program (LPP) annually appropriates $200 million from the Road Maintenance and Rehabilitation Account to local and regional transportation agencies that have passed sales tax measures, developer fees, or other imposed transportation fees. Funds are awarded for roadway maintenance and rehabilitation, sound walls, and other transportation improvement projects. LPP also funds local and regional agency projects that improve aging infrastructure, roadway conditions, active transportation, and health and safety. Consistent with the intent behind SB1, the CTC intends this program to balance the need to direct increased revenue to the State's highest transportation needs and the need to fairly distributing the economic impact of increased funding.

https://catc.ca.gov/programs/sb1/local-partnership-program

## Sustainable Transportation Grant Program

Caltrans

The Sustainable Transportation Planning Grant Program was created to support the Caltrans mission: provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability. Eligible planning projects must have a transportation nexus and ideally demonstrate that they directly benefit the multimodal transportation system. Sustainable Communities Grants will also improve public health, social equity, environmental justice, the environment, and provide other important community benefits.

https://dot.ca.gov/programs/transportation-planning/regional-planning/sustainable-transportation-planning-grants

## State Highway Operation and Protection Program (SHOPP)

Caltrans

SHOPP is the "fix-it-first" program from the State Highway System (SHS). SHOPP funds repair and preservation, emergency repairs, safety improvements, and some highway operational improvements on the SHS. Although SHOPP is intended for projects on statutorily designated State-owned roads, highways (including the interstate system), and bridges, it can be used for associated bicycle and pedestrian facilities. Revenues for the SHOPP are generated by federal and State gas taxes and are fiscally constrained by the State Transportation Improvement Program Fund Estimate that is produced by Caltrans and adopted by the CTC.

https://dot.ca.gov/programs/financial-programming/state-highway-operation-protection-program-shopp-minor-program-shopp

## State Transportation Improvement Program (STIP)

CTC

The STIP is a biennial, five-year plan adopted by the CTC for future allocations of certain State transportation funds for State highway improvements, intercity rail, and regional highway and transit improvements. State law requires the CTC to update the STIP biennially, on even-numbered years, with each new STIP adding two new years to prior programming commitments. CTC staff recommendations are based on the combined programming capacity for the Public Transportation Account (PTA) and State Highway Account (SHA) as identified in the fund estimate adopted by the CTC. To be included in the STIP that is adopted by the CTC, projects must first be nominated by the MTC in its Regional Transportation Improvement Program (RTIP), or by Caltrans in its Interregional Transportation Improvement Program (ITIP). https://catc.ca.gov/programs/state-transportation-improvement-program

## Recreational Trails Program (RTP)

California Department of Parks and Recreation

RTP annually provides federal funds for recreational trails and trail-related projects. The RTP is administered at the federal level by the FHWA and at the state level by the California Department of Parks and Recreation (DPR) and the Department of Transportation (Caltrans) Active Transportation Program (ATP). Eligible non-motorized projects include acquisition of easements and fee simple title to property for recreational trails and recreational trail corridors; and development or rehabilitation of trails, trailside, and trailhead facilities.

https://www.parks.ca.gov/?page_id=24324

## Affordable Housing and Sustainable Communities (AHSC) Program

California Strategic Growth Council

The AHSC program aims to reduce greenhouse gas emissions through projects that implement land-use, housing, transportation, and agricultural land preservation practices to support infill and compact development and that support related and coordinated public policy objectives. The AHSC program includes transportation focuses related to reducing air pollution, improving conditions in disadvantaged communities, supporting or improving public health, improving connectivity and access to jobs, increasing options for mobility, and increasing transit ridership. Funding for the AHSC Program is provided from the Greenhouse Gas Reduction Fund (GGRF), an account established to receive cap-and-trade auction proceeds.

https://sgc.ca.gov/programs/ahsc/

## Transformative Climate Communities (TCC) Program

California Strategic Growth Council

Established by Assembly Bill 2722, the TCC program funds development and implementation of neighborhood-level transformative climate community plans that include multiple coordinated greenhouse gas emissions reduction projects that provide local economic, environmental, and health benefits to disadvantaged communities. The TCC Program helps realize the State's vision of vibrant communities and

landscapes and demonstrates how meaningful community engagement coupled with strategic investments in transportation, housing, food, energy, natural resources, and waste can reduce greenhouse gas emissions and pollution, advance social and health equity, and enhance economic opportunity and community resilience. The TCC Program funds both implementation and planning grants. While the program can fund a variety of projects, transportation-related projects can include developing active transportation and public transit projects; supporting transit ridership programs and transit passes for low-income riders; expanding first/last mile connections; building safe and accessible biking and walking routes; and encouraging education and planning activities to promote increased use of active transportation modes.

https://sgc.ca.gov/programs/tcc/

## Environmental Enhancement and Mitigation (EEM) Grant Program

California Natural Resources Agency

The EEM program authorizes the California State Legislature to allocate up to $7 million each fiscal year from the Highway Users Tax Account. EEM projects must contribute to mitigation of the environmental effects of transportation facilities. The EEM Program does not generally fund commute-related trails or similar bicycle and pedestrian infrastructure. However, EEM does fund recreational and nature trails as part of storm water management or green infrastructure projects.

https://catc.ca.gov/programs/environmental-enhancement-mitigation

## Urban Greening Grant Program

California Natural Resources Agency

Part of the California State Senate Bill 859, the Urban Greening Program is funded by the Greenhouse Gas Reduction Fund to support the development of green infrastructure projects that reduce greenhouse gas emissions and other benefits. To maximize economic, environmental, and public benefits, priority is given to projects in disadvantaged communities. The Urban Greening Program funds projects that reduce greenhouse gases by sequestering carbon, decreasing energy consumption, and reducing vehicle miles traveled while transforming the built environment into places that are more sustainable, enjoyable, and effective at creating healthy and vibrant communities. These projects will establish and enhance parks and open space by using natural solutions to improve air and water quality, reducing energy consumption, and creating more walkable and bikeable trails.

https://files.resources.ca.gov/grants/urban-greening/

## Environmental Justice (EJ) Small Grants Program

California Environmental Protection Agency

EJ Small Grants provide funding to help eligible non-profit community organizations and federally-recognized Tribal governments address environmental justice issues in areas disproportionately affected by environmental pollution and hazards. EJ Small Grants are awarded on a competitive basis with a maximum amount $50,000 per grant. EJ Small Grants can be used for a variety of environmental purposes and to augment community engagement, health, trainings, and programmatic opportunities in underserved communities.

https://calepa.ca.gov/envjustice/funding/

Number ST0122 | LOCAL ROADWAY SAFETY PLAN | Program STREETS

**PROJECT DESCRIPTION**

The project will provide for developing a Local Roadway Safety Plan (LRSP). The LRSP will prioritize safety for all users, and provide a framework to identify, analyze, and prioritize roadway safety improvements on local roads. Aligning with federal regulations, the State's Strategic Highway Safety Plan, and the vision for California, the LRSP would guide the City to data driven solutions for safer streets. It would identify the stakeholders, use safety data to identify safety issues, choose proven solutions, identify the implementation process, and support future safety investments. The LRSP offers a proactive approach to addressing safety needs, improve transportation safety by reducing the risk of fatality and injury and improve responsiveness to safety challenges.

The LRSP along with the current update of the Bicycle and Pedestrian Master Plan will propose a transportation system that promotes multi-modal transportation options and community safety. The key goal of the LRSP is to provide safe, comfortable, and convenient travel along the City's roadways through a comprehensive, integrated transportation network for all users. The LRSP is anticipated to be completed in summer 2022. The State of California contributed $72,000 towards this project.

**ANNUAL OPERATING IMPACT:** None

**MANAGING DEPARTMENT:** Public Works

2022-2027 CAPITAL IMPROVEMENT PROGRAM

| ESTIMATED COSTS | | PRIOR YEARS | 2022-2023 BUDGET | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | FUTURE YEARS | TOTALS |
|---|---|---|---|---|---|---|---|---|---|
| 9100 | Salaries & Benefits | $5,826 | $15,454 | | | | | | $21,280 |
| 9200 | Contract Services | $37,475 | $77,105 | | | | | | $114,580 |
| 9400 | Improvements | | $2,120 | | | | | | $2,120 |
| **TOTAL** | | **$43,301** | **$94,679** | | | | | | **$137,980** |

| FUNDING SOURCE | | PRIOR YEARS | 2022-2023 BUDGET | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | FUTURE YEARS | TOTALS |
|---|---|---|---|---|---|---|---|---|---|
| 2206 | State Transportation Improvement | $43,301 | $28,699 | | | | | | $72,000 |
| 2214 | Measure BB Sales Tax - Local Streets Fund | | $65,980 | | | | | | $65,980 |
| **TOTAL** | | **$43,301** | **$94,679** | | | | | | **$137,980** |

| ANNUAL OPERATING IMPACT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

Number ST0123 TRAFFIC SIGNAL AND ROADWAY SAFETY IMPROVEMENTS Program STREETS

**PROJECT DESCRIPTION**

This project will provide for feasibility, design, and construction and modification of traffic signals and roadway safety improvements at locations prioritized and recommended by Local Roadway Safety Plan (LRSP). LRSP is anticipated to be completed by summer 2022. Improvements may include upgrading the signal equipment such as traffic signal poles/mast arms, vehicle and pedestrian signal heads, signal controllers, cabinet upgrades, streetlighting/safety lighting improvements, signal phasing and timing changes, signing and striping improvements, and other alternatives. The project will also provide for evaluating the design and installation of protected intersection elements.

**ANNUAL OPERATING IMPACT:** TBD

**MANAGING DEPARTMENT:** Public Works

| | | | 2022-2027 CAPITAL IMPROVEMENT PROGRAM | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **ESTIMATED COSTS** | | **PRIOR YEARS** | **2022-2023 BUDGET** | **2023-2024** | **2024-2025** | **2025-2026** | **2026-2027** | **FUTURE YEARS** | **TOTALS** |
| 9100 | Salaries & Benefits | | $10,400 | $10,400 | | | | | $20,800 |
| 9200 | Contract Services | | $49,600 | $99,600 | | | | | $149,200 |
| **TOTAL** | | | **$60,000** | **$110,000** | | | | | **$170,000** |

| **FUNDING SOURCE** | | **PRIOR YEARS** | **2022-2023 BUDGET** | **2023-2024** | **2024-2025** | **2025-2026** | **2026-2027** | **FUTURE YEARS** | **TOTALS** |
|---|---|---|---|---|---|---|---|---|---|
| 2215 | Measure BB Sales Tax - Bike & Pedestrian Fund (ACTC) | | $30,000 | $55,000 | | | | | $85,000 |
| 2214 | Measure BB Sales Tax - Local Streets Fund (ACTC) | | $30,000 | $55,000 | | | | | $85,000 |
| **TOTAL** | | | **$60,000** | **$110,000** | | | | | **$170,000** |

| **ANNUAL OPERATING IMPACT** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

DUBLIN
CALIFORNIA

# 7.1 - Local Roadway Safety Plan

January 10, 2023
City Council

# Overview of LRSP

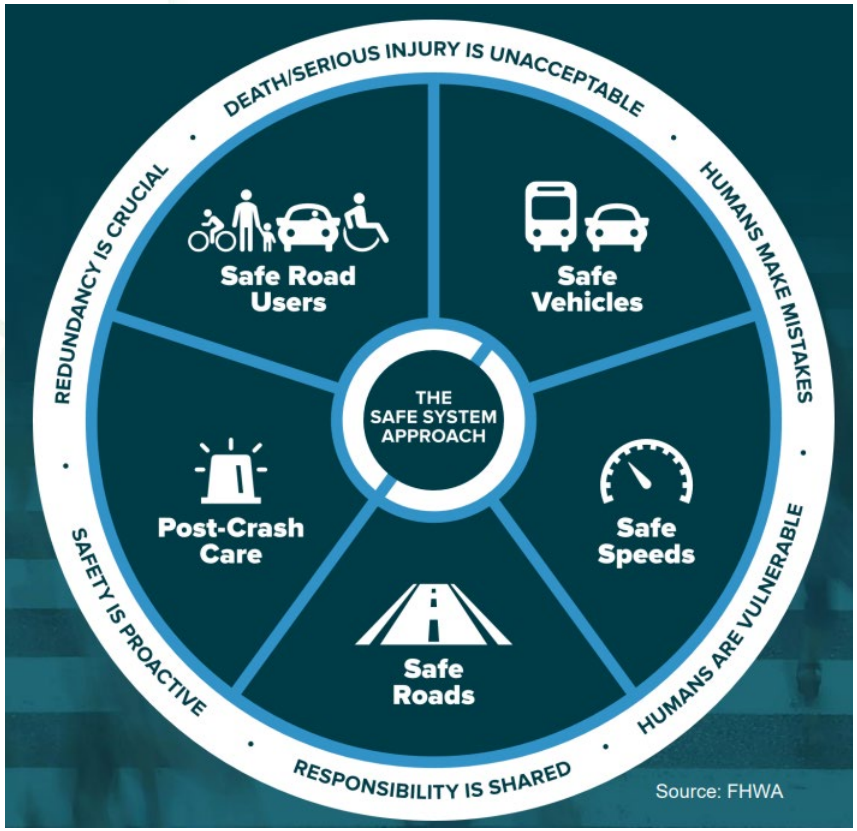
- Introduction
- Safe System Approach
- Vision/Goals
- Safety Partners
- Collision Analysis
- Toolbox - Countermeasures
- Proposed Recommendations
- Implementation
- Next Steps

# LRSP Introduction

- Local Road Safety Plans (LRSPs) are becoming a **requirement**.
  - For Caltrans HSIP funding, ACTC CIP grants **local agencies must have an LRSP or equivalent planning document.**
  - LRSP is local equivalent of State Highway Safety Plan (SHSP)
  - Creating an LRSP is an FHWA "proven safety countermeasure"
- LRSP basics:
  - Provide assessment of roadway safety
  - Identify actions and prioritized list of improvements/actions
  - Identify safety partners (e.g, departments and community organizations)
  - Follow federal and state commitment to Safe System approach

# Safe System Approach

- Safe System Approach (SSA) promotes redundancy to prevent traffic deaths.
- Five key elements have been adopted by the profession (see right)
  - These are an evolution of the "E"s of traffic safety
  - These elements provide a framework for action




The five elements to a Safe System
Source: FHWA

# Vision and Goals

## Vision

The City of Dublin will prioritize safety in all projects and will reduce the number of fatal and severe injury collisions even as the city continues to grow. The City will use data and Safe System principles recommended by FHWA and SHSP to promote safety in all actions.

## Goals

- Implement safety countermeasures to reduce the risk of future collisions.
- Analyze data to identify and prioritize opportunities to improve roadway safety.
- Promote a culture of roadway safety in Dublin's agencies, businesses, and residents.

# Toolbox - Countermeasures

- Background
  - Countermeasures pulled from Caltrans Local Roadway Safety manual (April 2020)
  - Each countermeasure has a documented Crash Reduction Factor and a relevant Emphasis Area
- Example Countermeasure

| Countermeasure Name | Caltrans LRSM CM ID | Documented Crash Reduction Factor | Federal Funding Eligibility through HSIP | Cost Estimate | Emphasis Area |
|---|---|---|---|---|---|
| Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number | S02 | 15% | 100% | $50,000 or less | Signalized Local/Arterial Intersections |

# Safety Partners

- Stakeholder list and comments shared from the Dublin Bicycle and Pedestrian Plan
- Example Safety Partners listed in LRSP
  - Police & Fire Services
  - Dublin Schools
  - Transit Agencies (LAVTA/BART)
  - Community Groups/Local Organizations (Bike East Bay, Chamber of Commerce, Health advocacy groups)

# Collision Analysis

- Crash Data Analysis
  - Data analyzed from Jan 1, 2016, through Dec 31, 2020
  - 1,455 collisions in the compiled database
  - 18 Fatal + Severe Injury
  - Trends in crash data informed five key emphasis areas for targeted improvements
  - 15 intersections, 5 roadway segments

- Emphasis Areas
  - Pedestrian Collisions
  - Nighttime Safety
  - Aging Drivers
  - Signalized Arterial/Local Intersections
  - Aggressive and Impaired Driving

# TOTAL COLLISIONS

Total Collisions: 1,455

Fatal/Severe Injury Collisions: 18



## INTERSECTION

TOTAL COLLISIONS **1,224 (84%)**

FATAL/SEVERE INJURY COLLISIONS **13 (72%)**



## SIGNAL

TOTAL COLLISIONS **844 (58%)**

FATAL/SEVERE INJURY COLLISIONS **8 (44%)**



## PEDESTRIAN

TOTAL COLLISIONS **26 (2%)**

FATAL/SEVERE INJURY COLLISIONS **2 (11%)**



## BICYCLE

TOTAL COLLISIONS **34 (2%)**

FATAL/SEVERE INJURY COLLISIONS **1 (6%)**



## MOTOR VEHICLE & MOTORCYCLE

TOTAL COLLISIONS **785 (54%)**

FATAL/SEVERE INJURY COLLISIONS **5 (28%)**




## UNSIGNALIZED

TOTAL COLLISIONS **380 (26%)**

FATAL/SEVERE INJURY COLLISIONS **5 (28%)**



## PEDESTRIAN

TOTAL COLLISIONS **24 (2%)**

FATAL/SEVERE INJURY COLLISIONS **3 (17%)**



## BICYCLE

TOTAL COLLISIONS **11 (1%)**

FATAL/SEVERE INJURY COLLISIONS **0 (0%)**



## MOTOR VEHICLE & MOTORCYCLE

TOTAL COLLISIONS **345 (24%)**

FATAL/SEVERE INJURY COLLISIONS **2 (11%)**



## SEGMENT

TOTAL COLLISIONS **231 (16%)**

FATAL/SEVERE INJURY COLLISIONS **5 (28%)**



## PEDESTRIAN

TOTAL COLLISIONS **3 (<1%)**

FATAL/SEVERE INJURY COLLISIONS **0 (0%)**



## BICYCLE

TOTAL COLLISIONS **11 (1%)**

FATAL/SEVERE INJURY COLLISIONS **1 (6%)**



## MOTOR VEHICLE & MOTORCYCLE

TOTAL COLLISIONS **217 (15%)**

FATAL/SEVERE INJURY COLLISIONS **4 (22%)**

*Reported collisions by location, City of Dublin, January 2016 - December 2*

# Collision Analysis

| Primary Collision Factor | Collision Type | | | | |
|---|---|---|---|---|---|
| | Rear End | Broadside | Hit Object | Vehicle/ Pedestrian | Other |
| Automobile Right of Way | 1% | 32% | 0% | 2% | 19% |
| Driving or Bicycling Under the Influence of Alcohol or Drug | 7% | 2% | 15% | 0% | 2% |
| Improper Turning | 5% | 9% | 30% | 0% | 7% |
| Other Improper Driving | 1% | 1% | 7% | 10% | 7% |
| Other Than Driver (or Pedestrian) | 1% | 1% | 7% | 0% | 7% |
| Pedestrian Right of Way | 0% | 1% | 0% | 29% | 4% |
| Pedestrian Violation | 0% | 0% | 0% | 22% | 0% |
| Traffic Signals and Signs | 0% | 33% | 1% | 2% | 4% |
| Unknown | 3% | 9% | 6% | 14% | 14% |
| Unsafe Speed | 72% | 2% | 23% | 6% | 11% |
| Unsafe Starting or Backing | 7% | 3% | 1% | 6% | 11% |
| Wrong Side of Road | 0% | 2% | 2% | 0% | 11% |
| *Other PCFs* | *3%* | *5%* | *8%* | *9%* | *3%* |
| **Total Reported Collisions** | **406 (100%)** | **309 (100%)** | **291 (100%)** | **51 (100%)** | **57 (100%)** |

Source: Statewide Integrated Traffic Reporting System (SWITRS), 2021; City of Dublin, 2021.

Notes: The three highest PCFs for each collision type are highlighted in red. If there is a tie for the third highest, all tied PCFs are highlighted.

# Top 20 Priority Locations

## Intersections

- Dublin Blvd and Arnold Rd
- Dublin Blvd & Village Pkwy
- Dublin Blvd & Donlon Way
- San Ramon Rd & Amador Valley Blvd
- Dublin Blvd & Dougherty Rd
- San Ramon Rd & Shannon Ave
- Dublin Blvd & Dublin Ct
- Dublin Blvd & Tassajara Rd
- Central Pkwy & Grafton St
- Hacienda Dr & Martinelli Way
- Dublin Blvd & Hacienda Dr
- Dougherty Rd & Sierra Ln
- Dublin Blvd & San Ramon Rd
- Village Pkwy & Amador Valley Blvd
- Dublin Blvd & Sierra Ct

## Roadway Segments

- Dougherty Rd (north of Willow Creek Dr to south of 8th St), 0.75 mi
- Fallon Rd (Signal Hill Dr to Gleason Dr) – 0.75 mi
- Village Pkwy (northern city limits to north of Tamarack Dr), 0.69 mi
- Amador Valley Blvd (Burton St to Dougherty Rd) – 0.75 mi
- Regional St (Amador Valley Blvd to south of Saint Patrick Way), 0.40 mi

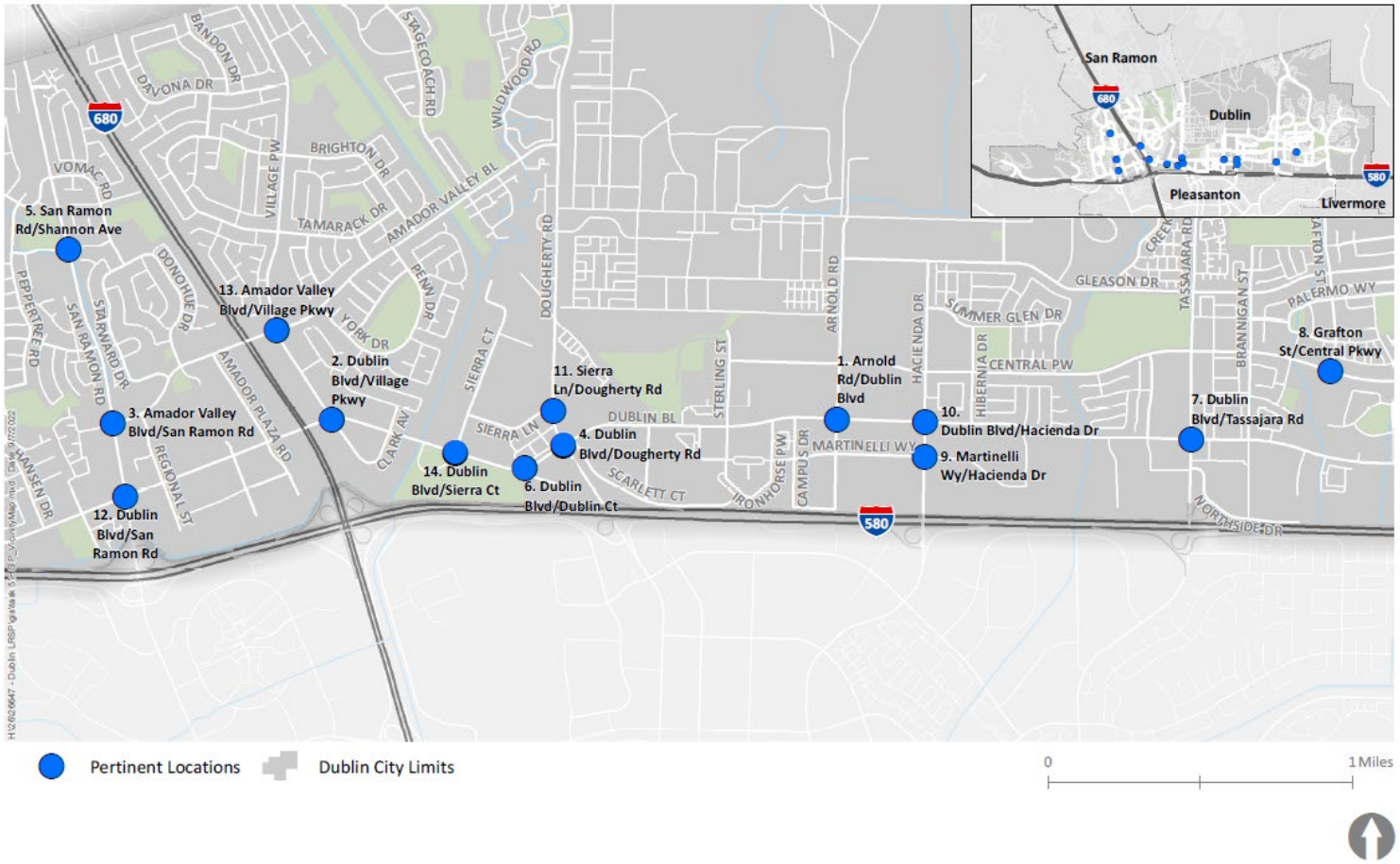
# Proposed Sample Recommendations – Intersections

- Signing and Striping Improvements
- Signal Timing Improvements
  - Evaluate Leading Pedestrian Intervals
- Evaluate "No Right Turn on Red"
- Improve Signal Hardware – Ex: Reflective Backplates
- RRFB's, Pedestrian Refuge Islands
- Evaluate the Removal of Right Turn Pockets

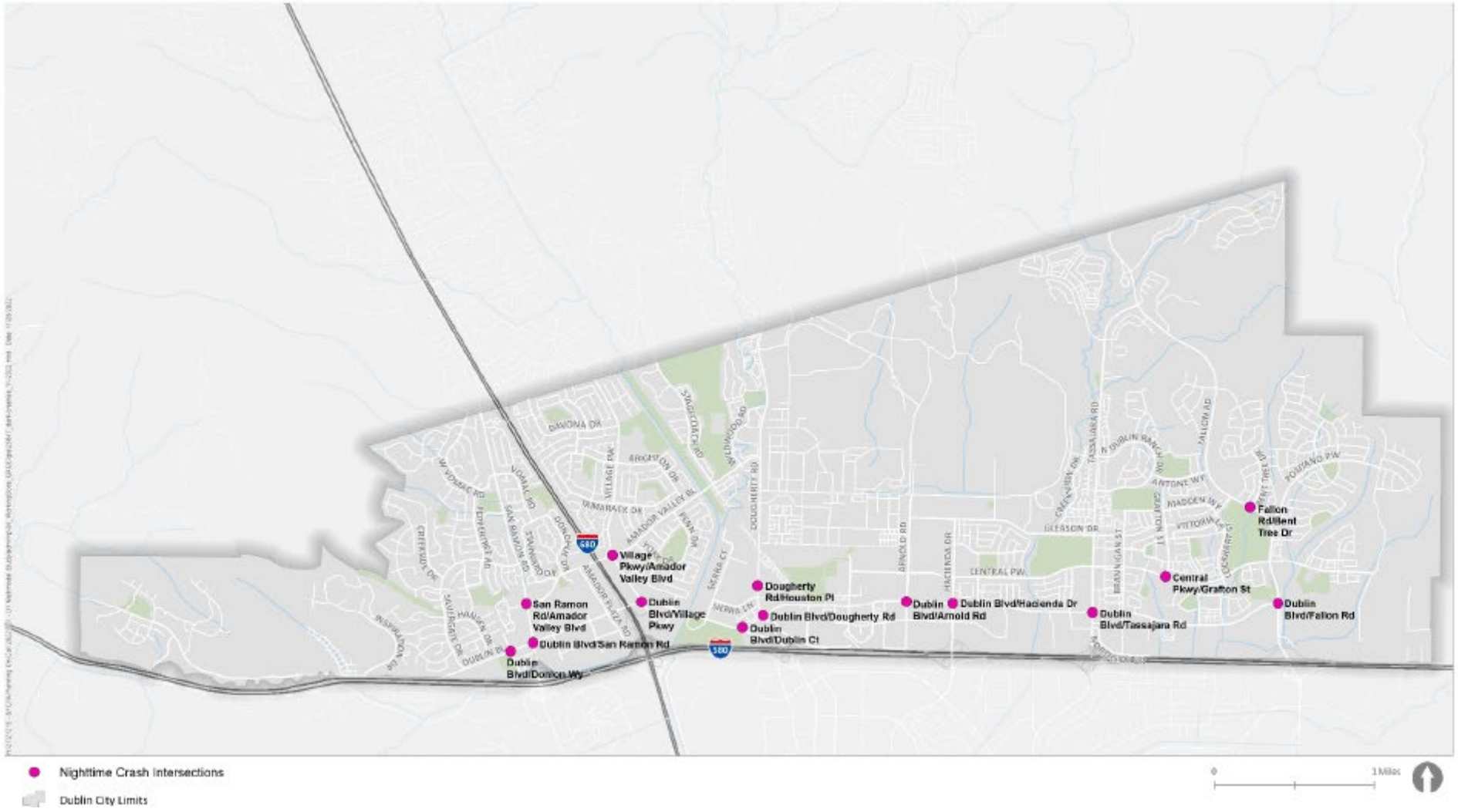
# Proposed Sample Recommendations - Roadways

- Speed Feedback Signs
- Roadway Segment Lighting
- Protected Intersection Elements
- Pedestrian Crossing Improvements
- Corridor Access Management

# Systemic Recommendations – Traffic Signal Hardware Upgrades



# Systemic Recommendations – Locations for Lighting Study



# Implementation

- ST0123 Traffic Signal and Safety Improvements
- HSIP – Application
  - Improve signal hardware at all 14 Priority Intersections
  - Furnish & Install LED Lights and High Visibility Backplates
  - Countermeasure Summary
    - Approx. Project Cost = $512,300
    - Total Expected Benefit = $8,634,644
    - **Benefit Cost Ratio = 16.85**

# Recommendation

Receive presentation and consider adopt the **Resolution** adopting the Local Roadway Safety Plan and find the Plan exempt from the California Environmental Quality Act