



## SPECIAL JOINT PLANNING COMMISSION/OPEN SPACE, ACTIVE TRANSPORTATION, AND SUSTAINABILITY COMMISSION MEETING AGENDA

December 6, 2023  
6:30 PM

**PC Chair:** Crystal Mallare  
**PC Vice Chair:** Brando Cruz  
**PC Commissioners:** Eric Altman, Andrew Goff, Davet Mohammed  
**PC Youth Commissioner:** DeAndre Lendsey

**OSATS Chair:** Tara McClinton-Horner  
**OSATS Vice Chair:** Scott Artis  
**OSATS Commissioners:** Barry Christian, Sean Hughes, Nance Matson  
**OSATS Youth Commissioner:** Allison Bencsik

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Tonight's meeting is a limited public forum. American Canyon promotes respectful and responsible behavior among its meeting participants, whether they are present in person or remotely. Using offensive language or remarks that promote, foster, or perpetuate discrimination based on race, creed, color, age, religion, gender marital status, status regarding public assistance, national origin, physical or mental disability or sexual orientation/gender identification, as well as any other category protected by federal, state or local laws will not be tolerated. In the case of an occurrence, the speaker will be immediately disconnected from the microphone.

*Public meetings will be conducted in person at City Hall, 4381 Broadway, Suite 201, American Canyon, CA 94503. This meeting is also available via Zoom Teleconferencing as a convenience for public participation. This meeting will be broadcast live to residents on Napa Valley TV, on our website [here](#) and on YouTube [here](#). Should technical issues with Zoom occur, please select another viewing option.*

### **PUBLIC PARTICIPATION**

**Oral comments, during the meeting:** Oral comments can be made in person or via Zoom. To give your public comment via zoom, connect via the below Zoom link and use the “raise your hand” tool, or call into the zoom meeting at 408-638-0968 and press \*9 to “raise your hand” when the item is called. To avoid confusion, all hands raised outside of Public Comment periods will be lowered.

**Written comments, via eComments:** Please submit written comments through the eComments link, located on the Meetings & Agendas page of our website [here](#). Comments will be available to Planning Commissioners in real time. To allow for review of comments, eComments will close at 3:00 pm on the day of the meeting. All comments received will be posted online and become part of the meeting record.

**Zoom Meeting Link:** [Click here.](#)

**Webinar ID:** 840 1905 8756 Passcode: 12345

The above-identified measures exceed all legal requirements for participation in public comment, including those imposed by the Ralph M. Brown Act. For more information, please call the Office of the City Clerk at (707) 647-4369 or email [cityclerk@cityofamericancanyon.org](mailto:cityclerk@cityofamericancanyon.org).

**AGENDA MATERIALS:** Planning Commission agenda materials are published 72 hours prior to the meeting and are available to the public via the City’s website at [www.cityofamericancanyon.org](http://www.cityofamericancanyon.org).

**AMERICANS WITH DISABILITIES ACT:** The Planning Commission will provide materials in appropriate alternative formats to comply with the Americans with Disabilities Act. Please send a written request to City Clerk at 4381 Broadway, Suite 201, American Canyon, CA 94503 or by email to [cityclerk@cityofamericancanyon.org](mailto:cityclerk@cityofamericancanyon.org). Include your name, address, phone number and brief description of the requested materials, as well as your preferred alternative format or auxiliary aid, at least three calendar days before the meeting.

## 6:30 P.M. REGULAR MEETING

CALL TO ORDER

ROLL CALL

## PUBLIC COMMENTS - ITEMS NOT ON THE AGENDA

*This time is reserved for members of the public to address the Planning Commission/Open Space, Active Transportation, and Sustainability Commission on items of interest that are not on the agenda and are within the subject matter jurisdiction of the Planning Commission/Open Space, Active Transportation, and Sustainability Commission. Comments are limited to 3 minutes. Comments for items on the agenda will be taken when the item is called. The Planning Commission/Open Space, Active Transportation, and Sustainability Commission are prohibited by law from taking any action on matters discussed that are not on the agenda, and no adverse conclusions should be drawn if the Planning Commission/Open Space, Active Transportation, and Sustainability Commission do not respond to public comment at this time. Speakers are asked to please speak clearly and provide their name. Any handouts for distribution to the Planning Commission/Open Space, Active Transportation, and Sustainability Commission must be emailed by 3:00 p.m. on meeting day. To comment via zoom during the meeting: click the "raise your hand" button if joining by computer, or press \*9 if joining by phone, when the item is called. To avoid confusion, hands raised outside of Public Comment periods will be lowered.*

## BUSINESS

### 1. **Active Transportation Development Standard Workshop**

**Recommendation:** Receive and file background report on Active Transportation Development Standards.

## ADJOURNMENT

## CERTIFICATION

I, Taresa Geilfuss, City Clerk for the City of American Canyon, do hereby declare that the foregoing agenda of the City Council was posted in compliance with the Brown Act prior to the meeting date.

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Taresa Geilfuss, CMC, City Clerk



## **TITLE**

Active Transportation Development Standard Workshop

## **RECOMMENDATION**

Receive and file background report on Active Transportation Development Standards.

## **CONTACT**

Brent Cooper, AICP, Community Development Director

## **BACKGROUND & ANALYSIS**

The Planning Commission (PC) and the Open Space, Active Transportation Commission and Sustainability (OSATS) Commission share a common interest to improve environmental quality and living conditions in our community. To further this shared goal, the City Council approved the Open Space, Active Transportation, and Sustainability Commission (OSATS) Fiscal Year 23/24 Work Plan on June 20, 2023. Work Plan Item 3 tasks the OSATS Commission to conduct a joint meeting with the Planning Commission to discuss Active Transportation Development Standards.

“Active Transportation” means human-powered energy, primarily walking and bicycling. According to *Partnership for Active Transportation*, a Community that prioritizes Active Transportation is healthier by having cleaner air to breathe and more opportunities for residents to be physically active in their daily routines. Active Transportation systems also foster economic health by creating dynamic, connected communities with a high quality of life that catalyzes small business development, increases property values, sparks tourism, and encourages corporate investment that attracts a talented, highly-educated workforce.

### *What is a Development Standard?*

A “Development Standard” is a design feature required on private property (or in-lieu fee) that furthers public health, safety, and welfare. Most Development Standards are required by the City of American Canyon, but they can also be required by Federal and State regulations. Examples of Development Standards include building height limits, setbacks, architectural standards, allowable uses, vehicle parking, park dedication requirements, impact fees, and Zero Water Footprint policy implementation, to name a few.

### *What are Active Transportation Development Standards?*

An “Active Transportation Development Standard” is required project feature that furthers walking and bicycling. Examples include bicycle parking and pedestrian sidewalk/trail access. In most cases, people walk or bike not just on a single site, but between properties, across town, or even further beyond. Because of the inherent “off-and-between property” nature of Active Transportation, Active Transportation Development Standards funded by developers frequently integrate with planned bicycle and pedestrian improvements managed and constructed by the City.

### *How Are Development Standards in American Canyon Adopted ?*

Before a Development Standard can be required, it must further public health, safety, and welfare and be adopted by Ordinance or Resolution. Except in narrow circumstances (i.e.: an Emergency, mandated by State or Federal law), every new Development Standard requires thorough outreach that weighs varied and potentially conflicting public and stakeholder needs and interests. In the past 12 months alone, the City has adopted numerous Policies (and Ordinances) that shape Development Standards in American Canyon. These include:

- Vehicle Miles Traveled (VMT) Policy
- Public Notice Ordinance and Site Posting Policy
- Smoke-Free Multiunit Ordinance
- Annual Impact Fee Inflation Adjustment
- 2022 Building and Fire Code Ordinance
- Housing Element Update
- Urban Water Management Plan Update

If American Canyon imposes an arbitrary or unauthorized Development Standard, the Development Standard is unenforceable and may result in the City facing monetary damages. Often, ideas emerge for design features during a public hearing. To ensure an unenforceable requirement is not approved, staff will inform the Commission when an idea may fall outside the bounds of a valid development standard.

### *Development Standard Adoption Process*

The Development Standard adoption process begins with a specific need brought to the City Council’s attention: Examples include:

- A request from a Councilmember or Appointed Council Commission,
- A staff proposal to serve an observed need,
- A change in policy (i.e.: New General Plan),
- State Mandate (i.e. Cannabis Initiative, Accessory Dwelling Unit law),
- A request from an Organization (i.e.: Napa Youth Council).

The City Council weighs many factors before authorizing a new policy, such as urgency, existing priorities, budget limitations, and staff time.

*Planning Commission and Open Space, Active Transportation Commission and Sustainability (OSATS) Commission Role*

As advisors to the City Council, the Planning and OSATS Commission members have a unique role in influencing land use policy in American Canyon. Each member was appointed on the basis of your role as the “eyes and ears” of American Canyon residents. The PC and OSATS Commissions can alert staff and Council when policies fail to “keep up” with American Canyon’s needs and priorities.

*Active Transportation Development Standards In Effect Today*

Listed below are the key regulations for Active Transportation in American Canyon derived from Federal, State, and Local laws and policies.

**Federal Law**

The Americans with Disabilities Act (ADA) (<https://www.ada.gov/>) is a broad-reaching federal civil rights law that guarantees people with disabilities the same opportunities as everyone else to enjoy employment opportunities, purchase goods and services, and participate in state and local government programs.

With regard to Active Transportation, the ADA requires accessible parking spaces and pedestrian accessibility throughout commercial sites (including apartments). Even though ADA focuses on accessibility for individuals with disabilities, the ADA makes sites easier to walk or bike for all users.

**State Law**

California Code of Regulations (Title 24) - Known as Title 24, and the Building Code, the California Code of Regulations reflects Federal ADA regulations by requiring pedestrian accessibility throughout a commercial site and bicycle parking as described below:

*Accessibility:* An accessible pedestrian path of travel must be provided from the public right-of-way to each building entrance. In sites with more than one building, the path of travel must include an accessible continuous pedestrian access route that connects all adjacent pedestrian facilities, elements, and spaces to the buildings on-site.

*Bicycle Parking:* The California Green Building Standards Code (CALGreen) requires short and long-term bicycle parking for non-residential structures. This State-wide rule applies unless local ordinances are more stringent.

- **Short-Term Bicycle Parking.** Short -term bicycle parking is intended for visitors staying two hours or less. Typically, visitors use public bike racks outside a store, park, or school. Common examples of short-term bike parking are the bike U rack and the bike corral as illustrated in Attachment 1.

### Short-Term Bike Parking Guidelines:

- Located between 50 feet 200 feet and visible from the entrance it serves.
- May be used by infrequent visitors, so the bike parking should be self-explanatory and easy to use.
- Locate in lighted areas of high pedestrian activity.
- Covered bike racks can encourage use.
- Short-term bike parking is also known as Class II bike parking (or Class 2, or Class Two).

### Short-Term Bike Parking Requirements:

When an addition or alteration adds 9 or more vehicular parking spaces, the number of short-term bicycle parking spaces must equal 5 percent of the new visitor vehicle parking spaces with a minimum of one rack that holds two-bikes — Section 5.106.4.1.1.

### Long-Term Bicycle Parking:

Long-term parking is intended for employees, residents, public transit users that need parking for several hours or more. Long-term bike parking is focused on security and weather protection. Common examples of long-term bike parking are bike lockers at a transit hub and a bike room in a residential complex as illustrated in Attachment 2.

### Long-Term Bike Parking Guidelines:

- Emphasizes physical security above public visibility, so close location to the destination may not be as important.
- Options for access control include user-supplied locks, keys, smart cards, or bike locker digital access.
- Signage may be needed for first-time users.
- Long-term bike parking is also known as Class I bike parking (or Class 1, or Class One).

### Long-Term Bike Parking Requirements:

New Buildings with 10 or more Tenant Occupants: The number of long-term bicycle parking spaces must equal 5 percent of new tenant-occupied motorized vehicle parking spaces being added, with a minimum of one bicycle parking facility — Section 5.106.4.1.2.

### Additions and Alterations

Additions or alterations that add 10 or more tenant-occupant vehicular parking spaces, must provide secure bicycle parking for 5 percent of the tenant vehicular parking spaces being added, with a minimum of one bicycle parking facility. – Section 5.106.4.1.3

Bicycle Transportation Design: The Caltrans Highway Design Manual and the American Association of State Highway and Transportation Officials (AASHTO) provide guidance on the design of bikeways.

Caltrans is a department of the State of California. AASHTO is a non-governmental standards setting body which publishes specifications, test protocols, and guidelines that are used in highway design and construction throughout the United States.

The thorough bicycle trail design and professional rigor that led to the standards makes this a useful and legally defensible resource for local agency bicycle trail design. A copy of the Caltrans Bicycle Transportation Design Manual is included as Attachment 3.

### **Local Law**

American Canyon, like every jurisdiction in California, is subject to State Planning and Land Use laws. Consistent with these laws, there is a hierarchy of policy documents that guide new and modified private property regulations, including Development Standards.

The top of the hierarchy is the General Plan, followed by Implementing Policies, such as Specific Plans, Zoning, numerous American Canyon Municipal Code Titles (i.e.: Business Licenses; Animals; Health and Safety; Public Peace, Morals and Welfare; Streets, Sidewalks and Public Places; and so on), Engineering Design Standards, and many other adopted policies. A graphic illustrating this hierarchy is included as Attachment 4.

General Plan: The General Plan includes goals and policies that support Active Transportation. A copy of these policies is included as Attachment 5. In addition, the General Plan Circulation Element has incorporated the City's Bicycle Master Plan (2020) and Pedestrian Master Plan (2017). These plans include detailed goals that guide private development improvements and City Capital Improvement Projects.

- Standard Street Cross Sections identify sidewalks and on-street bicycle lanes for certain Street Classifications. A graphic of the Street Cross Sections is included as Attachment 6.
- The Bicycle Master Plan identifies locations and priorities for new bicycle trails but does not recommend standards for development of these facilities. A copy of the City's Bicycle Master Plan is included as Attachment 7.
- The Pedestrian Plan in Appendix D includes Development Standard recommendations for sidewalks and trails. A copy of the Pedestrian Plan is included as Attachment 8.

Specific Plans: A Specific Plan is a planning document that implements the goals and policies of the General Plan. These plans contain detailed development standards and implementation measures to which future projects located within a specified geographic area must adhere. Two recent Specific Plans include the Watson Ranch Specific Plan and the Broadway District Specific Plan.

a. Watson Ranch Specific Plan: The Watson Ranch Specific Plan (WRSP) is a 300-acre private land development. The WRSP includes a goal for Active Transportation through safe streets and an interconnected trail system. Specific Active Transportation features include:

- Sidewalks,
- Roadway connections between cul-de-sacs,
- Traffic calming measures, such as narrow streets at intersections, and
- A comprehensive pedestrian and bicycle network.

As Watson Ranch builds out, it must include these Active Transportation features in the community. A graphic that depicts examples of Watson Ranch Active Transportation Street features is included as Attachment 9. A map depicting the pedestrian and bicycle network is included as Attachment 10.

b. Broadway District Specific Plan: Much like the Watson Ranch Specific Plan (WRSP), the Broadway District Specific Plan (BDSP) includes goals for safe pedestrian access, and improved connections between neighboring BDSP properties and the surrounding neighborhoods. For example, Policy 3-15 requires vehicle and pedestrian interconnections with reciprocal access easements between neighboring properties to improve access and customer convenience and reduce short vehicle trips on Broadway.

The BDSP also includes a plan for Class 1 bicycle lanes on the east and west sides of Broadway and identifies a route for the River to Ridge trail.

As properties develop in the BDSP, the City will require Active Transportation features incorporated into the project, and construction of any pedestrian or bicycle facilities planned along the property frontage. For example, the Hampton Inn project will construct pedestrian and bicycle facilities along the Highway 29 frontage, pedestrian, bicycle and automobile access from Donaldson Way, and a pedestrian/bicycle bridge to connect this site with neighboring Canyon Plaza.

Subdivision Ordinance (ACMC Title 18):

A Subdivision is the act of dividing land into two or more parcels that are easier to sell or develop. As described in the Subdivision Ordinance, proposed land subdivisions must conform to the General Plan, Zoning Ordinance, any Specific Plans, and all applicable City policies. Design and Improvement Standards include, but not limited to the type, density, and intensity of use established for the site, any phasing requirements, and reservations of roadways, utilities, and infrastructure services.

Subdivision Ordinance Active Transportation Development Standards:

- Section 18.40.090 requires the subdivider to dedicate and improve trails and walkways within the subdivision at least ten feet wide across long blocks, access to schools, parks, open spaces or other public areas, and trails or walkways shown on the General Plan or any applicable Specific Plan.
- Section 18.42.055 requires the subdivider to dedicate and improve infrastructure located off the property (i.e.: "Off-Site") if determined to necessary by the City Engineer and required by the Planning Commission and/or the City Council as conditions of subdivision approval.

Common examples of Off-Site improvements include extending utilities and roadways to serve the site. An off-site bicycle trail or sidewalk extension may also be required to fill a missing gap in the trail/pedestrian system. Such an extension would typically be subject to fee credits or reimbursement. The Watson Ranch Master Subdivision Map includes off-site utility and road extensions to serve the project.

### Zoning Code (ACMC Title 19):

- Section 19.21.050 (Parking Code) requires Bicycle Parking in non-residential sites based on a proportion of vehicle parking spaces up to a maximum of ten bicycle parking spaces. Adopted in 2004, the Zoning Code bicycle parking standards are less stringent than the CalGreen Building Code. Thus, the CalGreen bicycle parking standards prevail. A copy of the Zoning Code bicycle parking standards is included as Attachment 11.
- Chapter 19.41 (Design Permit Application) requires most new development to demonstrate compliance with applicable zoning and development standards. Adequate pedestrian circulation and bicycle parking are areas of design that is considered in a Design Permit.

### *Where to Go From Here?*

The PC and OSATS Commission's "eyes and ears" of American Canyon is a valuable asset to keep our Development Standards relevant and useful for our community. While Development Standards cannot be changed when a project comes before a Commission, they serve as a test example of how Development Standards apply to a project. On larger projects, workshops and scoping sessions provide advance opportunities to comment on how the project accomplishes Active Transportation or other public priorities while there is still flexibility in the project design. When a Development Standard, in the opinion of the Commission majority appears to be outdated, the issue can be brought to the City Council's attention for its consideration.

When Council decides that a Development Standard requires updating, staff will use its expertise to conduct outreach, weigh options, and follow a legal process to ensure the new standard meets community expectations and legal rigor.

## **COUNCIL PRIORITY PROGRAMS AND PROJECTS**

Outdoors and Recreation: "Expand opportunities for use of outdoor recreation and an active and healthy lifestyle."

### **ATTACHMENTS:**

1. [Short Term Bike Parking Examples](#)
2. [Long Term Bike Parking Examples](#)
3. [Caltrans Highway Design Manual Bikeway Standards](#)
4. [The Planning Hierarchy](#)
5. [General Plan Policies That Support Active Transportation](#)
6. [General Plan Roadway Cross Sections](#)
7. [American Canyon Bicycle Master Plan](#)
8. [American Canyon Pedestrian Plan](#)
9. [WRSP Active Transportation Street Examples](#)

10. WRSP Bicycle and Pedestrian Trail Network

11. Bicycle Parking Zoning Code

Short-Term Bicycle Parking Facilities



Bike U Rack with Crossbar



Classic Bike U Rack



Vintage Bike Racks



Hi-Lo Bike Stall



CyclePort Bike Shelter



Compact Shelter



Modern Bike Racks



Cycle Park



Custom U Racks



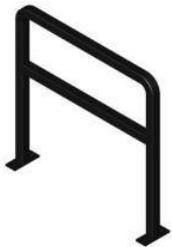
Pocket Shelter



Bike Corral



Bike Stations



Staple Rack



Rail-Mount Bike Rack



Straight Bike Stall



Bike Parking Tubular Marker

Long-Term Bicycle Parking Facilities



ProPark Bike Locker Bank



ProPark Standard Model



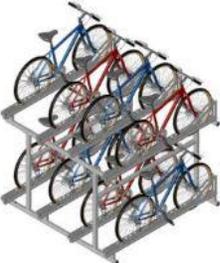
EcoPark Standard Model



Cargo Bike Locker



Quad Hi-Density Bike Rack



OctoRack Hi-Density Bike Rack



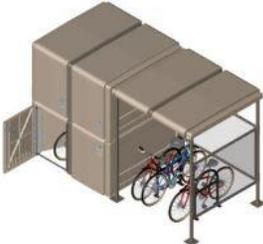
ProPark Door-View



EcoPark Door-View



ProPark Side-View



Bike Stations



Bluetooth Cellular Access Bike Locker



ProPark View-Thru



ProPark Double-Tier Standard



ProPark Double-Tier Door-View

# CHAPTER 1000 – BICYCLE TRANSPORTATION DESIGN

## Topic 1001 – Introduction

### Index 1001.1 – Bicycle Transportation

The needs of nonmotorized transportation are an essential part of all highway projects. Mobility for all travel modes is recognized as an integral element of the transportation system. Therefore, the guidance provided in this manual complies with Deputy Directive 64-R2: Complete Streets - Integrating the Transportation System. See AASHTO, “Guide For The Development Of Bicycle Facilities”.

Design guidance for Class I bikeways (bike paths), Class III bikeways (bike routes) and Trails are provided in this chapter. Design guidance that addresses the mobility needs of bicyclists on all roads as well as on Class II bikeways (bike lanes) is distributed throughout this manual where appropriate. Design guidance for Class IV bikeways (separated bikeways) is provided in DIB 89. The AASHTO Guide for the Development of Bicycle Facilities also provides additional bikeway guidance not included in this chapter. In addition, bikeway publications and manuals developed by organizations other than FHWA and AASHTO also provide guidance not covered in this manual.

See Topic 116 for guidance regarding bikes on freeways.

### 1001.2 Streets and Highways Code References

The Streets and Highways Code Section 890.4 defines a “bikeway” as a facility that is provided primarily for bicycle travel. Following are other related definitions, found in Chapter 8 Nonmotorized Transportation, from the Streets and Highway Code:

- (a) Section 887 – Definition of nonmotorized facility.
- (b) Section 887.6 – Agreements with local agencies to construct and maintain nonmotorized facilities.
- (c) Section 887.8 – Payment for construction and maintenance of nonmotorized facilities approximately paralleling State highways.
- (d) Section 888 – Severance of existing major non- motorized route by freeway construction.
- (e) Section 888.2 – Incorporation of nonmotorized facilities in the design of freeways.
- (f) Section 888.4 – Requires Caltrans to budget not less than \$360,000 annually for nonmotorized facilities used in conjunction with the State highway system.
- (g) Section 890.4 – Class I, II, III, and cycle tracks or separated bikeway definitions.

July 1, 2020

- (h) Section 890.6 - 890.8 – Caltrans and local agencies to develop design criteria and symbols for signs, markers, and traffic control devices for bikeways and roadways where bicycle travel is permitted.
- (i) Section 891 – Local agencies must comply with design criteria and uniform symbols.
- (j) Section 892 – Use of abandoned right-of-way as a nonmotorized facility.

### 1001.3 Vehicle Code References

- (a) Section 21200 – Bicyclist's rights and responsibilities for traveling on highways.
- (b) Section 21202 – Bicyclist's position on roadways when traveling slower than the normal traffic speed.
- (c) Section 21206 – Allows local agencies to regulate operation of bicycles on pedestrian or bicycle facilities.
- (d) Section 21207 – Allows local agencies to establish bike lanes on non-State highways.
- (e) Section 21207.5 – Prohibits motorized bicycles on bike paths or bike lanes.
- (f) Section 21208 – Specifies permitted movements by bicyclists from bike lanes.
- (g) Section 21209 – Specifies permitted movements by vehicles in bike lanes.
- (h) Section 21210 – Prohibits bicycle parking on sidewalks unless pedestrians have an adequate path.
- (i) Section 21211 – Prohibits impeding or obstruction of bicyclists on bike paths.
- (j) Section 21400 – Adopt rules and regulations for signs, markings, and traffic control devices for roadways user.
- (k) Section 21401 – Only those official traffic control devices that conform to the uniform standards and specifications promulgated by the Department of Transportation shall be placed upon a street or highway.
- (l) Section 21717 – Requires a motorist to drive in a bike lane prior to making a turn.
- (m) Section 21960 – Use of freeways by bicyclists.
- (n) Section 21966 – No pedestrian shall proceed along a bicycle path or lane where there is an adjacent adequate pedestrian facility.

### 1001.4 Bikeways

- (1) *Role of Bikeways.* Bikeways are one element of an effort to improve bicycling safety and convenience - either to help accommodate motor vehicle and bicycle traffic on the roadway system, or as a complement to the road system to meet the needs of the bicyclist.

Off-street bikeways in exclusive corridors can be effective in providing new recreational opportunities, and desirable transportation/commuter routes. Off-street bikeways can also provide access with bridges and tunnels which cross barriers to bicycle travel (e.g., freeway or river crossing). Likewise, on-street bikeways can serve to enhance safety and

convenience, especially if other commitments are made in conjunction with establishment of bikeways, such as: elimination of parking or increased roadway width, elimination of surface irregularities and roadway obstacles, frequent street sweeping, established intersection priority on the bike route street as compared with the majority of cross streets, and installation of bicycle-sensitive loop detectors at signalized intersections.

- (2) *Decision to Develop Bikeways.* Providing an interconnected network of bikeways will improve safety for all users and access for bicycles. The development of well conceived bikeways can have a positive effect on bicyclist and motorist behavior. In addition, providing an interconnected network of bikeways along with education and enforcement can improve safety and access for bicyclists. The decision to develop bikeways should be made in coordination with the local agencies.

## Topic 1002 – Bikeway Facilities

### 1002.1 Selection of the Type of Facility

The type of facility to select in meeting the bicyclist's need is dependent on many factors, but the following applications are the most common for each type.

- (1) *Shared Roadway (No Bikeway Designation).* Most bicycle travel in the State now occurs on streets and highways without bikeway designations and this may continue to be true in the future as well. In some instances, entire street systems may be fully adequate for safe and efficient bicycle travel, where signing and pavement marking for bicycle use may be unnecessary. In other cases, prior to designation as a bikeway, routes may need improvements for bicycle travel.

Many rural highways are used by touring bicyclists for intercity and recreational travel. It might be inappropriate to designate the highways as bikeways because of the limited use and the lack of continuity with other bike routes. However, the development and maintenance of 4-foot paved roadway shoulders with a standard 4 inch edge line can significantly improve the safety and convenience for bicyclists and motorists along such routes.

- (2) *Class I Bikeway (Bike Path).* Generally, bike paths should be used to serve corridors not served by streets and highways or where wide right of way exists, permitting such facilities to be constructed away from the influence of parallel streets. Bike paths should offer opportunities not provided by the road system. They can either provide a recreational opportunity, or in some instances, can serve as direct high-speed commute routes if cross flow by motor vehicles and pedestrian conflicts can be minimized. The most common applications are along rivers, ocean fronts, canals, utility right of way, abandoned railroad right of way, within school campuses, or within and between parks. There may also be situations where such facilities can be provided as part of planned developments. Another common application of Class I facilities is to close gaps to bicycle travel caused by construction of freeways or because of the existence of natural barriers (rivers, mountains, etc.).
- (3) *Class II Bikeway (Bike Lane).* Bike lanes are established along streets in corridors where there is significant bicycle demand, and where there are distinct needs that can be served

July 1, 2020

by them. The purpose should be to improve conditions for bicyclists in the corridors. Bike lanes are intended to delineate the right of way assigned to bicyclists and motorists and to provide for more predictable movements by each. But a more important reason for constructing bike lanes is to better accommodate bicyclists through corridors where insufficient room exists for side-by-side sharing of existing streets by motorists and bicyclists. This can be accomplished by reducing the number of lanes, reducing lane width, or prohibiting or reconfiguring parking on given streets in order to delineate bike lanes. In addition, other things can be done on bike lane streets to improve the situation for bicyclists that might not be possible on all streets (e.g., improvements to the surface, augmented sweeping programs, special signal facilities, etc.). Generally, pavement markings alone will not measurably enhance bicycling.

If bicycle travel is to be provided by delineation, attention should be made to assure that high levels of service are provided with these lanes. It is important to meet bicyclist expectations and increase bicyclist perception of service quality, where capacity analysis demonstrates service quality measures are improved from the bicyclist's point of view.

Design guidance that addresses the mobility needs of bicyclists on Class II bikeways (bike lanes) is also distributed throughout this manual where appropriate.

(4) *Class III Bikeway (Bike Route)*. Bike routes are shared facilities which serve either to:

- (a) Provide continuity to other bicycle facilities (usually Class II bikeways); or
- (b) Designate preferred routes through high demand corridors.

As with bike lanes, designation of bike routes should indicate to bicyclists that there are particular advantages to using these routes as compared with alternative routes. This means that responsible agencies have taken actions to assure that these routes are suitable as shared routes and will be maintained in a manner consistent with the needs of bicyclists. Normally, bike routes are shared with motor vehicles. The use of sidewalks as Class III bikeways is strongly discouraged.

(5) *Class IV Bikeways (Separated Bikeways)*. See DIB 89 for guidance.

A Class IV bikeway (separated bikeway) is a bikeway for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic. The separation may include, but is not limited to, grade separation, flexible posts, inflexible posts, inflexible barriers, or on-street parking. See DIB 89 for further Class IV guidance.

It is emphasized that the designation of bikeways as Class I, II, III, and IV should not be construed as a hierarchy of bikeways; that one is better than the other. Each class of bikeway has its appropriate application.

In selecting the proper facility, an overriding concern is to assure that the proposed facility will not encourage or require bicyclists or motorists to operate in a manner that is inconsistent with the rules of the road.

An important consideration in selecting the type of facility is continuity. Alternating segments of Class I to Class II (or Class III) bikeways along a route are generally incompatible, as street crossings by bicyclists is required when the route changes character. Also, wrong-way

bicycle travel will occur on the street beyond the ends of bike paths because of the inconvenience of having to cross the street. However, alternating from Class IV to Class II may be appropriate due to the presence of many driveways or turning movements. The highway context or community setting may also influence the need to alternate bikeway classifications.

## Topic 1003 – Bikeway Design Criteria

### 1003.1 Class I Bikeways (Bike Paths)

Class I bikeways (bike paths) are facilities with exclusive right of way, with cross flows by vehicles minimized. Motor vehicles are prohibited from bike paths per the CVC, which can be reinforced by signing. Class I bikeways, unless adjacent to an adequate pedestrian facility, (see Index 1001.3(n)) are for the exclusive use of bicycles and pedestrians, therefore any facility serving pedestrians must meet accessibility requirements, see DIB 82. However, experience has shown that if regular pedestrian use is anticipated, separate facilities for pedestrians maybe beneficial to minimize conflicts. Please note, sidewalks are not Class I bikeways because they are primarily intended to serve pedestrians, generally cannot meet the design standards for Class I bikeways, and do not minimize vehicle cross flows. See Index 1003.3 for discussion of the issues associated with sidewalk bikeways.

(1) *Widths and Cross Slopes.* See Figure 1003.1A for two-way Class I bikeway (bike path) width, cross slope, and side slope details. The term “shoulder” as used in the context of a bike path is an unobstructed all weather surface on each side of a bike path with similar functionality as shoulders on roadways with the exception that motor vehicle parking and use is not allowed. The shoulder area is not considered part of the bike path traveled way.

Experience has shown that paved paths less than 12 feet wide can break up along the edge as a result of loads from maintenance vehicles.

(a) **Traveled Way.** **The minimum paved width of travel way for a two-way bike path shall be 8 feet**, 10-foot preferred. **The minimum paved width for a one-way bike path shall be 5 feet.** It should be assumed that bike paths will be used for two-way travel. 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. Two-way use of bike paths designed for one-way travel increases the risk of head-on collisions, as it is difficult to enforce one-way operation. This is not meant to apply to two one-way bike paths that are parallel and adjacent to each other within a wide right of way.

Where heavy bicycle volumes are anticipated and/or significant pedestrian traffic is expected, the paved width of a two-way bike path should be greater than 10 feet, preferably 12 feet or more. Another important factor to consider in determining the appropriate width is that bicyclists will tend to ride side by side on bike paths, and bicyclists may need adequate passing clearance next to pedestrians and slower moving bicyclists.

See Index 1003.1(16) Drainage, for cross slope information.

July 1, 2020

(b) **Shoulder.** A minimum 2-foot wide shoulder, composed of the same pavement material as the bike path or all weather surface material that is free of vegetation, shall be provided adjacent to the traveled way of the bike path when not on a structure; see Figure 1003.1A. A shoulder width of 3 feet should be provided where feasible. A wider shoulder can reduce bicycle conflicts with pedestrians. Where the paved bike path width is wider than the minimum required, the unpaved shoulder area may be reduced proportionately. If all or part of the shoulder is paved with the same material as the bike path, it is to be delineated from the traveled way of the bike path with an edgeline.

See Index 1003.1(16), Drainage, for cross slope information.

(2) *Bike Path Separation from a Pedestrian Walkway.* The CVC requires a pedestrian to use a pedestrian facility when adjacent to a bike path. Thus, the bike path would be only for bicycles if there is an adjacent pedestrian facility. This may be either immediately adjacent or with a separation between the pedestrian facility and the bike path. The separation may be—but not limited to—fences, railings, solid walls, or landscaping. If a separation is used, it should not obstruct stopping sight distance along curves or corner sight distance at intersections with roadways or other paths.

(3) *Clearance to Obstructions.* **A minimum 2-foot horizontal clearance from the paved edge of a bike path to obstructions shall be provided.** See Figure 1003.1A. 3 feet should be provided. Adequate clearance from fixed objects is needed regardless of the paved width. If a path is paved contiguous with a continuous fixed object (e.g., fence, wall, and building), a 4-inch white edge line, 2 feet from the fixed object, is recommended to minimize the likelihood of a bicyclist hitting it. **The clear width of a bicycle path on structures between railings shall be not less than 10 feet.** It is desirable that the clear width of structures be equal to the minimum clear width of the path plus shoulders (i.e., 14 feet).

**The vertical clearance to obstructions across the width of a bike path shall be a minimum of 8 feet and 7 feet over shoulder.** Where practical, a vertical clearance of 10 feet is desirable.

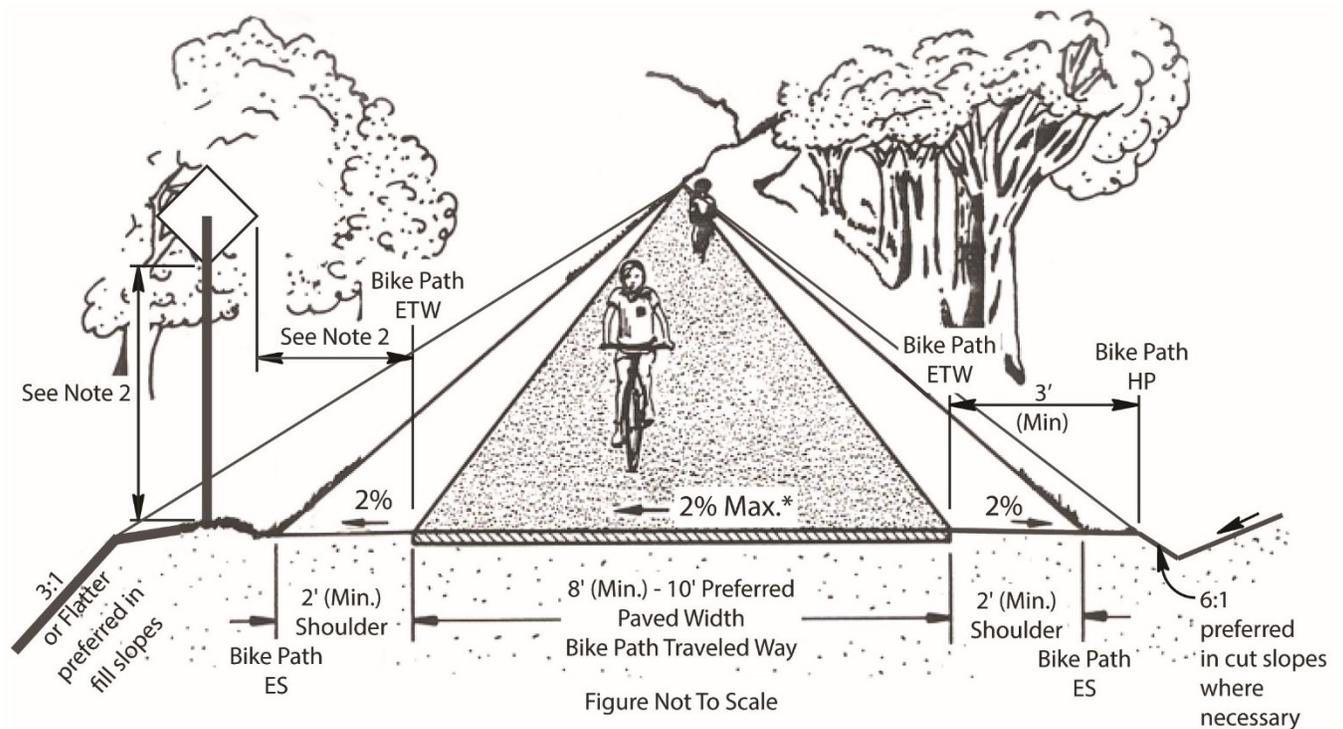
(4) *Signing and Delineation.* For application and placement of signs, see the California MUTCD, Section 9B. For pavement marking guidance, see the California MUTCD, Section 9C.

(5) *Intersections with Highways.* Intersections are an important consideration in bike path design. Bicycle path intersection design should address both cross-traffic and turning movements. If alternate locations for a bike path are available, the one with the most beneficial intersection characteristics should be selected.

Where motor vehicle cross traffic and bicycle traffic is heavy, grade separations are desirable to eliminate intersection conflicts. Where grade separations are not feasible, assignment of right of way by traffic signals should be considered. Where traffic is not

Figure 1003.1A

Two-Way Class I Bikeway (Bike Path)



NOTES:

- (1) See Index 1003.1(15) for pavement structure guidance of bike path.
- (2) For sign clearances, see California MUTCD, Figure 9B-1. Also, for clearance over the shoulder see Index 1003.1(3).
- (3) The AASHTO Guide for the Development of Bicycle Facilities provides detailed guidance for creating a forgiving Class I bikeway environment.

\*1% cross-slope minimum.

July 1, 2020

heavy, "STOP" or "YIELD" signs for either the path or the cross street (depending on volumes) may suffice.

Bicycle path intersections and their approaches should be on relatively flat grades. Stopping sight distances at intersections should be checked and adequate warning should be given to permit bicyclists to stop before reaching the intersection, especially on downgrades. When contemplating the placement of signs the designer is to discuss the proposed sign details with their District Traffic Safety Engineer or designee so that conflicts may be minimized. Bicycle versus motor vehicle collisions may occur more often at intersections, where bicyclists misuse pedestrian crosswalks; thus, this should be avoided.

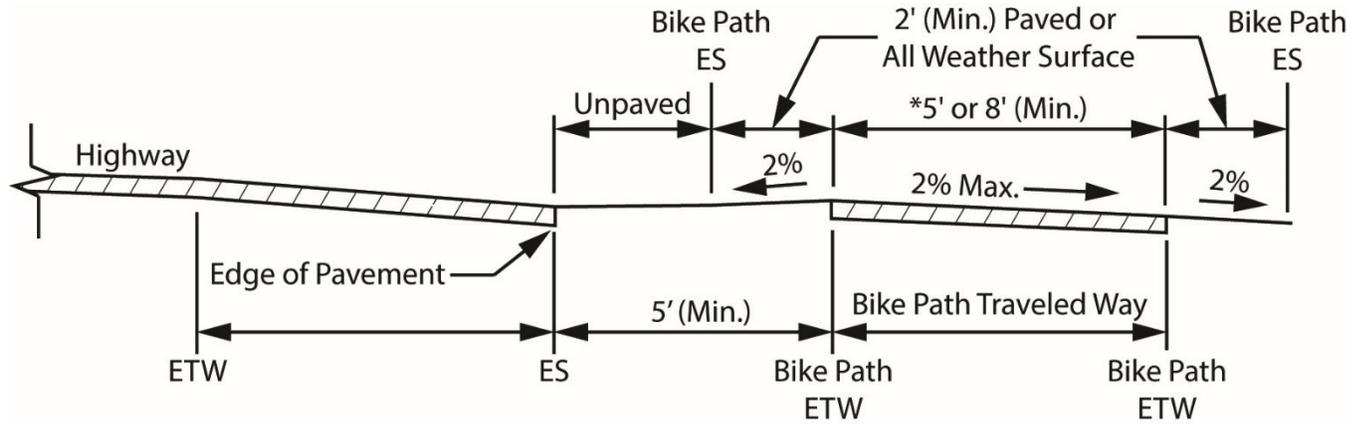
When crossing an arterial street, the crossing should either occur at the pedestrian crossing, where vehicles can be expected to stop, or at a location completely out of the influence of any intersection to permit adequate opportunity for bicyclists to see turning vehicles. When crossing at midblock locations, right of way should be assigned by devices such as "YIELD" signs, "STOP" signs, or traffic signals which can be activated by bicyclists. 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. Where bike path "STOP" or "YIELD" signs are visible to approaching motor vehicle traffic, they should be shielded to avoid confusion. In some cases, Bike Xing signs may be placed in advance of the crossing to alert motorists. Ramps should be installed in the curbs, to preserve the utility of the bike path. Ramps should be the same width as the bicycle paths. Curb cuts and ramps should provide a smooth transition between the bicycle paths and the roadway.

Assignment of rights of way is necessary where bicycle paths intersect roadways or other bicycle paths. See the California MUTCD, Section 9B.03 and Figure 9B-7 for guidance on signals and signs for rights of way assignment at bicycle path intersections.

- (6) *Paving at Crossings.* At unpaved roadway or driveway crossings, including bike paths or pedestrian walkways, the crossing roadway or driveway shall be paved a minimum of 15 feet to minimize or eliminate gravel intrusion on the path. The pavement structure at the crossing should be adequate to sustain the expected loading at that location
- (7) *Bike Paths Parallel and Adjacent to Streets and Highways.* A wide separation is recommended between bike paths and adjacent highways (see Figure 1003.1B). **The minimum separation between the edge of traveled way of a one-way or a two-way bicycle path and the edge of traveled way of a parallel road or street shall be 5 feet plus the standard shoulder width. Bike paths within the clear recovery zone of freeways shall include a physical barrier separation.** The separation is unpaved and does not include curbs or sidewalks. Separations less than 10 feet from the edge of the shoulder are to include landscaping or other features that provide a continuous barrier to prevent bicyclists from encroaching onto the highway. Suitable barriers may include fences or dense shrubs if design speeds are less than or equal to 45 miles per hour. Obstacles low to the ground or intermittent obstacles (e.g., curbs, dikes, raised traffic bars, posts connected by cable or wire, flexible channelizers, etc.) are not to be used because bicyclists could fall over these obstacles and into the roadway.

Figure 1003.1B

Typical Cross Section of Class I Bikeway (Bike Path) Parallel to Highway



NOTE:

(1) See Index 1003.1(6) for guidance on separation between bike paths and highways.

\*One-Way: 5' Minimum Width

Two-Way: 8' Minimum Width

July 1, 2020

Bike paths immediately adjacent to streets and highways are not recommended. While they can provide separation between vehicles and nonmotorized traffic, they typically introduce significant conflicts at intersections. In addition, they can create conflicts with passengers at public transit facilities, and with vehicle occupants crossing the path. They are not a substitute for designing the road to meet bicyclist's mobility needs. Use of bicycle paths adjacent to roads is not mandatory in California, and many bicyclists will perceive these paths as offering a lower level of mobility compared with traveling on the road, particularly for utility trips. Careful consideration regarding how to address the above points needs to be weighed against the perceived benefits of providing a bike path adjacent to a street or highway. Factors such as urban density, the number of conflict points, the presence or absence of a sidewalk, speed and volume should be considered.

(8) *Bike Paths in the Median of Highway or Roadway.* Bike paths should not be placed in the median of a State highway or local road, and shall not be in the median of a freeway or expressway. Bike paths in the median are generally not recommended because they may require movements contrary to normal rules of the road. Specific problems with such facilities may include:

- (a) Right-turns by bicyclists from the median of roadways are unexpected by motorists.
- (b) Devoting separate phases to bicyclist movements to and from a median path at signalized intersections increases intersection delay.
- (c) Left-turning motorists must cross one direction of motor vehicle traffic and two directions of bicycle traffic, which may increase conflicts.
- (d) Where intersections are infrequent, bicyclists may choose to enter or exit bike paths at midblock.
- (e) Where medians are landscaped, visibility between bicyclists on the path and motorists at intersections may be diminished. See Chapter 900 for planting guidance.

(9) *Bicycle Path Design Speed.* The design speed of bicycle paths is established using the same principles as those applied to highway design speeds. **The design speed given in Table 1003.1 shall be the minimum.**

Installation of "speed bumps", gates, obstacles, posts, fences or other similar features intended to cause bicyclists to slow down are not to be used.

(10) *Horizontal Alignment and Superelevation.* The minimum radius of curvature negotiable by a bicycle is a function of the superelevation of the bicycle path surface, the coefficient of friction between the bicycle tires and the bicycle path surface, and the speed of the bicycle.

For all bicycle path applications the maximum superelevation rate is 2 percent.

The minimum radius of curvature should be 90 feet for 20 miles per hour, 160 feet for 25 mile per hour and 260 feet for 30 miles per hour. No superelevation is needed for radius of curvature meeting or exceeding 100 feet for 20 miles per hour, 180 feet for 25 miles per hour, and 320 feet for 30 miles per hour. When curve radii smaller than those given because of right of way, topographical or other considerations, standard curve warning signs and supplemental pavement markings should be installed. The negative

**Table 1003.1**

**Bike Path Design Speeds**

Type of Facility	Design Speed (mph) <sup>(1)</sup>
Bike Paths with Mopeds Prohibited	20
Bike Paths with Mopeds Permitted	30
Bike Paths on Long Downgrades (steeper than 4%, and longer than 500')	30

NOTE:

<sup>(1)</sup>On bike paths with mopeds prohibited, a lower design speed can be used for the crest vertical curve, equivalent to 1 mile per hour per percent grade for grades exceeding a vertical rise of 10 feet, when at a crest in path.

effects of nonstandard curves can also be partially offset by widening the pavement through the curves.

(11)*Stopping Sight Distance.* To provide bicyclists with an opportunity to see and react to the unexpected, a bicycle path should be designed with adequate stopping sight distances. **The minimum stopping sight distance based on design speed shall be 125 feet for 20 miles per hour, 175 feet for 25 miles per hour and 230 feet for 30 miles per hour.** The distance required to bring a bicycle to a full controlled stop is a function of the bicyclist's perception and brake reaction time, the initial speed of the bicycle, the coefficient of friction between the tires and the pavement, and the braking ability of the bicycle.

Stopping sight distance is measured from a bicyclist's eyes, which are assumed to be 4 ½ feet above the pavement surface to an object ½-foot high on the pavement surface.

(12)*Length of Crest Vertical Curves.* Figure 1003.1C indicates the minimum lengths of crest vertical curves for varying design speeds.

(13)*Lateral Clearance on Horizontal Curves.* Figure 1003.1D indicates the minimum clearances to line of sight obstructions, *m*, for horizontal curves. It is assumed that the bicyclist's eyes are 4 ½ feet above the pavement surface to an object ½-foot high on the pavement surface.

Bicyclists frequently ride abreast of each other on bicycle paths, and on narrow bicycle paths, bicyclists have a tendency to ride near the middle of the path. For these reasons, lateral clearances on horizontal curves should be calculated based on the sum of the stopping sight distances for bicyclists traveling in opposite directions around the curve. Where this is not possible or feasible, the following or combination thereof should be

July 1, 2020

Figure 1003.1C

**Minimum Length of Bicycle Path Crest Vertical Curve (L) Based on Stopping Sight Distance (S)**

$$L = 2S - \frac{1600}{A} \quad \text{when } S > L$$

Double line represents S = L

L = Minimum length of vertical curve – feet

A = Algebraic grade difference – %

$$L = \frac{AS^2}{1600} \quad \text{when } S < L$$

S = Stopping sight distance – feet

Refer to Index 1003.1(11) to determine “S”, for a given design speed “V”

Height of cyclist eye = 4½ feet

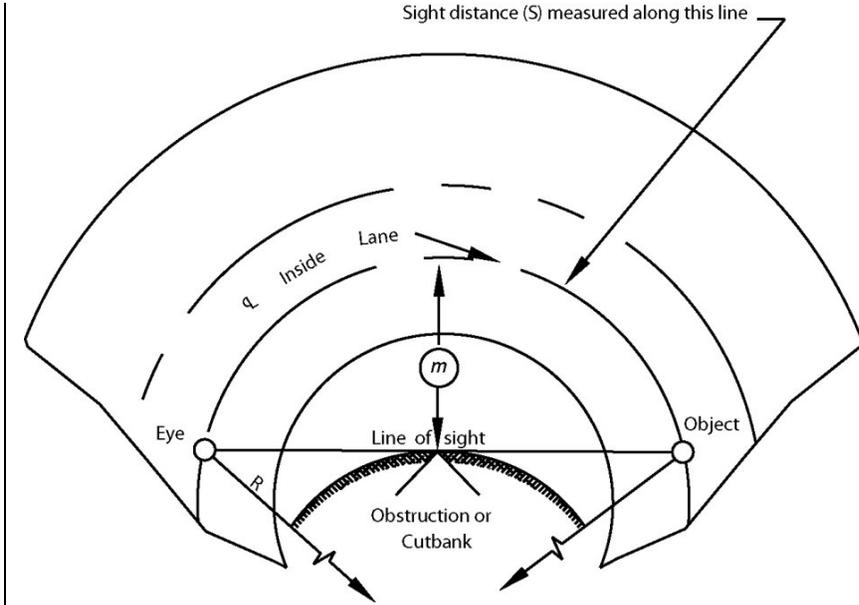
Height of object = ½ foot

A (%)	S = Stopping Sight Distance (ft)												
	70	90	110	125	130	150	170	175	190	210	230	250	270
3													7
4										20	60	100	140
5							20	30	60	100	140	180	220
6		S > L				33	73	83	113	153	193	233	270
7				21	31	71	111	121	151	191	231	273	319
8			20	50	60	100	140	150	180	221	265	313	365
9		2	42	72	82	122	162	172	203	248	298	352	410
10		20	60	90	100	140	181	191	226	276	331	391	456
11		35	75	105	115	155	199	211	248	303	364	430	501
12	7	47	87	117	127	169	217	230	271	331	397	469	547
13	17	57	97	127	137	183	235	249	293	358	430	508	592
14	26	66	106	137	148	197	253	268	316	386	463	547	638
15	33	73	113	146	158	211	271	287	338	413	496	586	683
16	40	80	121	156	169	225	289	306	361	441	529	625	729
17	46	86	129	166	180	239	307	325	384	469	562	664	775

S < L

Figure 1003.1D

Minimum Lateral Clearance (m) on Bicycle Path Horizontal Curves



$S$  = Sight distance in ft.

$R$  = Radius of  $\phi$  of lane in ft.

$m$  = Distance from  $\phi$  of lane in ft.

Refer to Index 1003.1(11) to determine "S" for a given design speed "V".

Angle is expressed in degrees

$$m = R \left[ 1 - \cos \left( \frac{28.65S}{R} \right) \right]$$

$$S = \frac{R}{28.655} \left[ \cos^{-1} \left( \frac{R-m}{R} \right) \right]$$

Formula applies only when  $S$  is equal to or less than length of curve.

Line of sight is 28" above  $\phi$  inside lane at point of obstruction.

Height of bicyclist's eye is 4 1/2 ft.

R (ft)	S = Stopping Sight Distance (ft)										
	60	80	100	120	140	160	180	200	220	240	260
25	15.9										
50	8.7	15.2	23.0	31.9	41.5						
75	5.9	10.4	16.1	22.8	30.4	38.8	47.8	57.4	67.2		
95	4.7	8.3	12.9	18.3	24.7	31.8	39.5	48.0	56.9	66.3	75.9
125		6.3	9.9	14.1	19.1	24.7	31.0	37.9	45.4	53.3	1.76
155		5.1	8.0	11.5	15.5	20.2	25.4	31.2	37.4	44.2	51.4
175		4.6	7.1	10.2	13.8	18.0	22.6	27.8	33.5	39.6	46.1
200		4.0	6.2	8.9	12.1	15.8	19.9	24.5	29.5	34.9	40.8
225			5.5	8.0	10.8	14.1	17.8	21.9	26.4	31.3	36.5
250			5.0	7.2	9.7	12.7	16.0	19.7	23.8	28.3	33.1
275			4.5	6.5	8.9	11.6	14.6	18.0	21.7	25.8	30.2
300			4.2	6.0	8.1	10.6	13.4	16.5	19.9	23.7	27.7
350				5.1	7.0	9.1	11.5	14.2	17.1	20.4	23.9
390				4.6	6.3	8.2	10.3	12.8	15.4	18.3	21.5
500					4.9	6.4	8.1	10.0	12.1	14.3	16.8
565					4.3	5.7	7.2	8.8	10.7	12.7	14.9
600					4.1	5.3	6.7	8.3	10.1	12.0	14.0
700						4.6	5.8	7.1	8.6	10.3	12.0
800						4.0	5.1	6.2	7.6	9.0	10.5
900							4.5	5.6	6.7	8.0	9.4
1000							4.0	5.0	6.0	7.2	8.4

July 1, 2020

provided: (a) the path through the curve should be widened to a minimum paved width of 14 feet; and (b) a yellow center line curve warning sign and advisory speed limit signs should be installed.

(14)*Grades.* Bike path grades must meet DIB 82. The maximum grade rate recommended for bike paths should be 5 percent. Sustained grades should be limited to 2 percent.

(15)*Pavement Structure.* The pavement material and structure of a bike path should be designed in the same manner as a highway, with a recommendation from the District Materials Branch. It is important to construct and maintain a smooth, well drained, all-weather riding surface with skid resistant qualities, free of vegetation growth. Principal loads will normally be from maintenance and emergency vehicles.

(16)*Drainage.* For proper drainage, the surface of a bike path should have a minimum cross slope of 1 percent to reduce ponding and a maximum of 2 percent per DIB 82. Sloping of the traveled way in one direction usually simplifies longitudinal drainage design and surface construction, and accordingly is the preferred practice. **The bike path shoulder shall slope away from the traveled way at 2 percent to 5 percent to reduce ponding and minimize debris from flowing onto the bike path.** Ordinarily, surface drainage from the path will be adequately dissipated as it flows down the gently sloping shoulder. However, when a bike path is constructed on the side of a hill, a drainage ditch of suitable dimensions may be necessary on the uphill side to intercept the hillside drainage. Where necessary, catch basins with drains should be provided to carry intercepted water under the path. Such ditches should be designed in such a way that no undue obstacle is presented to bicyclists.

Culverts or bridges are necessary where a bike path crosses a drainage channel.

(17)*Entry Control for Bicycle Paths.* Obstacle posts and gates are fixed objects and placement within the bicycle path traveled way can cause them to be an obstruction to bicyclists. Obstacles such as posts or gates may be considered only when other measures have failed to stop unauthorized motor vehicle entry. Also, these obstacles may be considered only where safety and other issues posed by actual unauthorized vehicle entry are more serious than the safety and access issues posed to bicyclists, pedestrians and other authorized path users by the obstacles.

The 3-step approach to prevent unauthorized vehicle entry is:

- (a) Post signs identifying the entry as a bicycle path with regulatory signs prohibiting motor vehicle entry where roads and bicycle paths cross and at other path entry points.
- (b) Design the path entry so it does not look like a vehicle access and makes intentional access by unauthorized users more difficult. Dividing a path into two one-way paths prior to the intersection, separated by low plantings or other features not conducive to motor vehicle use, can discourage motorists from entering and reduce driver error.
- (c) Assess whether signing and path entry design prevents or minimizes unauthorized entry to tolerable levels. If there are documented issues caused by unauthorized motor vehicle entry, and other methods have proven ineffective, assess whether the issues posed by unauthorized vehicle entry exceed the crash risks and access issues posed by obstacles.

If the decision is made to add bollards, plantings or similar obstacles, they should be:

- Yielding to minimize injury to bicyclists and pedestrians who may strike them.
- Removable or moveable (such as posts, bollards or gates) for emergency and maintenance access must leave a flush surface when removed.
- Reflectorized for nighttime visibility and painted, coated, or manufactured of material in a bright color to enhanced daytime visibility.
- Illuminated when necessary.
- Spaced to leave a minimum of 5 feet of clearance of paved area between obstacles (measured from face of obstacle to face of adjacent obstacle). Symmetrically about the center line of the path.
- Positioned so an even number of bicycle travel lanes are created, with a minimum of two paths of travel. An odd number of openings increase the risk of head-on collisions if traffic in both directions tries to use the same opening.
- Placed so additional, non-centerline/lane line posts are located a minimum of 2 feet from the edge of pavement
- Delineated as shown in California MUTCD Figure 9C-2.
- Provide special advance warning signs or painted pavement markings if sight distance is limited.
- Placed 10 to 30 feet back from an intersection, and 5 to 10 feet from a bridge, so bicyclists approach the obstacle straight-on and maintenance vehicles can pull off the road.
- Placed beyond the clear zone on the crossing highway, otherwise breakaway.

When physical obstacles are needed to control unauthorized vehicle access, a single non-removable, flexible, post on the path centerline with a separate gate for emergency/maintenance vehicle access next to the path, is preferred. The gate should swing away from the path.

**Fold-down obstacle posts or fold-down bollards shall not be used within the paved area of bicycle paths.** They are often left in the folded down position, which presents a crash hazard to bicyclists and pedestrians. When vehicles drive across fold-down obstacles, they can be broken from their hinges, leaving twisted and jagged obstructions that project a few inches from the path surface.

Obstacle posts or gates must not be used to force bicyclists to slow down, stop or dismount. Treatments used to reduce vehicle speeds may be used where it is desirable to reduce bicycle speeds.

For obstacle post visibility marking, and pavement markings, see the California MUTCD, Section 9C.101(CA).

(18)*Lighting.* Fixed-source lighting raises awareness of conflicts along paths and at intersections. In addition, lighting allows the bicyclist to see the bicycle path direction, surface conditions, and obstacles. Lighting for bicycle paths is important and should be considered where nighttime use is not prohibited, in sag curves (see Index 201.5), at

July 1, 2020

intersections, at locations where nighttime security could be a problem, and where obstacles deter unauthorized vehicle entry to bicycle paths. See Index 1003.1(17). Daytime lighting should also be considered through underpasses or tunnels.

Depending on the location, average maintained horizontal illumination levels of 5 lux to 22 lux should be considered. Where special security problems exist, higher illumination levels may be considered. Light standards (poles) should meet the recommended horizontal and vertical clearances. Luminaires and standards should be at a scale appropriate for a pedestrian or bicycle path. For additional guidance on lighting, consult with the District Traffic Electrical Unit.

### 1003.2 Class II Bikeways (Bike Lanes)

Design guidance that address the safety and mobility needs of bicyclists on Class II bikeways (bike lanes) is distributed throughout this manual where appropriate.

For Class II bikeway signing and lane markings, see the California MUTCD, Section 9C.04.

### 1003.3 Class III Bikeways (Bike Routes)

Class III bikeways (bike routes) are intended to provide continuity to the bikeway system. Bike routes are established along through routes not served by Class I or II bikeways, or to connect discontinuous segments of bikeway (normally bike lanes). Class III facilities are facilities shared with motor vehicles on the street, which may be indicated by placing bike route signs along roadways. Additional enhancement of Class III facilities can be provided by adding shared roadway markings along the route. For application and placement of signs and pavement markings, see the California MUTCD Sections 9B and 9C.

Minimum widths for Class III bikeways are represented, in the minimum standards for highway lanes and shoulder.

Since bicyclists are permitted on all highways (except prohibited freeways), the decision to designate the route as a bikeway should be based on the advisability of encouraging bicycle travel on the route and other factors listed below.

- (1) *On-street Bike Route Criteria.* To be of benefit to bicyclists, bike routes should offer a higher degree of service than alternative streets. Routes should be signed only if some of the following apply:
  - (a) They provide for through and direct travel in bicycle-demand corridors.
  - (b) Connect discontinuous segments of bike lanes.
  - (c) They provide traffic actuated signals for bicycles and appropriate assignment of right of way at intersections to give greater priority to bicyclists, as compared with alternative streets.
  - (d) Street parking has been removed or restricted in areas of critical width to provide improved safety.
  - (e) Surface imperfections or irregularities have been corrected (e.g., utility covers adjusted to grade, potholes filled, etc.).

(f) Maintenance of the route will be at a higher standard than that of other comparable streets (e.g., more frequent street sweeping).

(2) *Sidewalk as Bikeway.* 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.

(3) *Shared Transit and Bikeways.* Transit lanes and bicycles are generally not compatible, and present risks to bicyclists. Therefore sharing exclusive use transit lanes for buses with bicycles is discouraged.

Bus and bicycle lane sharing should be considered only under special circumstances to provide bikeway continuity, such as:

- (a) If bus operating speed is 25 miles per hour or below.
- (b) If the grade of the facility is 5 percent or less.

## 1003.4 Trails

Trails are generally, unpaved multipurpose facilities suitable for recreational use by hikers, pedestrians, equestrians, and off-road bicyclists. While many Class I facilities are named as trails (e.g. Iron Horse Regional Trail, San Gabriel River Trail), trails as defined here do not meet Class I bikeways standards and should not be signed as bicycle paths. Where equestrians are expected, a separate equestrian trail should be provided. See DIB 82 for trail requirements for ADA. See Index 208.7 for equestrian undercrossing guidance.

- Pavement requirements for bicycle travel are not suitable for horses. Horses require softer surfaces to avoid leg injuries.
- Bicyclists may not be aware of the need to go slow or of the separation need when approaching or passing a horse. Horses reacting to perceived danger from predators may behave unpredictably; thus, if a bicyclist appears suddenly within their visual field, especially from behind they may bolt. To help horses not be surprised by a bicyclist, good visibility should be provided at all points on equestrian paths.
- When a corridor includes equestrian paths and Class I bikeways, the widest possible lateral separation should be provided between the two. A physical obstacle, such as an open rail fence, adjacent to the equestrian trail may be beneficial to induce horses to shy away from the bikeway, as long as the obstacle does not block visibility between the equestrian trail and bicycle path.

See FHWA-EP-01-027, *Designing Sidewalks and Trails for Access* and DIB 82 for additional design guidance.

July 1, 2020

## 1003.5 Miscellaneous Criteria

The following are miscellaneous bicycle treatment criteria. Specific application to Class I, and III bikeways are noted. Criteria that are not noted as applying only to bikeways apply to any highway, roadways and shoulders, except freeways where bicycles are prohibited), without regard to whether or not bikeways are established.

Bicycle Paths on Bridges – See Topic 208.

- (1) *Pavement Surface Quality.* The surface to be used by bicyclists should be smooth, free of potholes, and with uniform pavement edges.
- (2) *Drainage Grates, Manhole Covers, and Driveways.* Drainage inlet grates, manhole covers, etc., should be located out of the travel path of bicyclists whenever possible. When such items are in an area that may be used for bicycle travel, they shall be designed and installed in a manner that meets bicycle surface requirements. See Standard Plans. They shall be maintained flush with the surface when resurfacing.

If grate inlets are to be located in roadway or shoulder areas (except freeways where bicycles are prohibited) the inlet design guidance of Index 837.2(2) applies.

Future driveway construction should avoid construction of a vertical lip from the driveway to the gutter, as the lip may create a problem for bicyclists when entering from the edge of the roadway at a flat angle. If a lip is deemed necessary, the height should be limited to ½ inch.

- (3) *At-grade Railroad Crossings and Cattle Guards.* Whenever it is necessary for a Class I bikeway, highway or roadway to cross railroad tracks, special care must be taken to ensure that the safety of users is protected. The crossing must be at least as wide as the traveled way of the facility. Wherever possible, the crossing should be straight and at right angles to the rails. For bikeways or highways that cross tracks and where a skew is unavoidable, the shoulder or bikeway should be widened, to permit bicyclists to cross at right angles (see Figure 1003.5). If this is not possible, special construction and materials should be considered to keep the flangeway depth and width to a minimum.

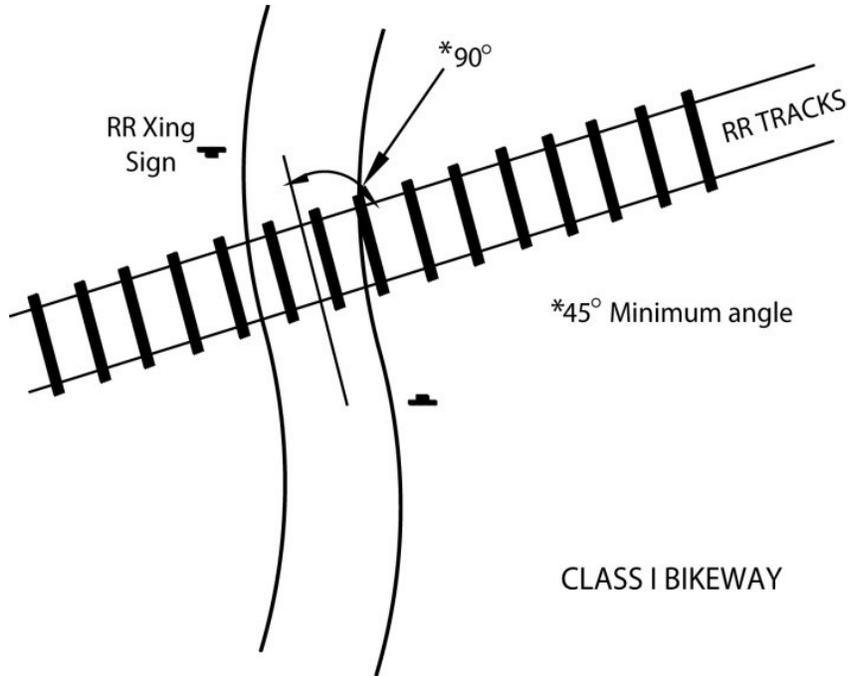
Pavement should be maintained so ridge buildup does not occur next to the rails. In some cases, timber plank crossings can be justified and can provide for a smoother crossing.

All railroad crossings are regulated by the California Public Utilities Commission (CPUC). All new bicycle path railroad crossings must be approved by the CPUC. Necessary railroad protection will be determined based on a joint field review involving the applicant, the railroad company, and the CPUC.

Cattle guards across any roadway are to be clearly marked with adequate advance warning. Cattle guards are only to be used where there is no other alternative to manage livestock.

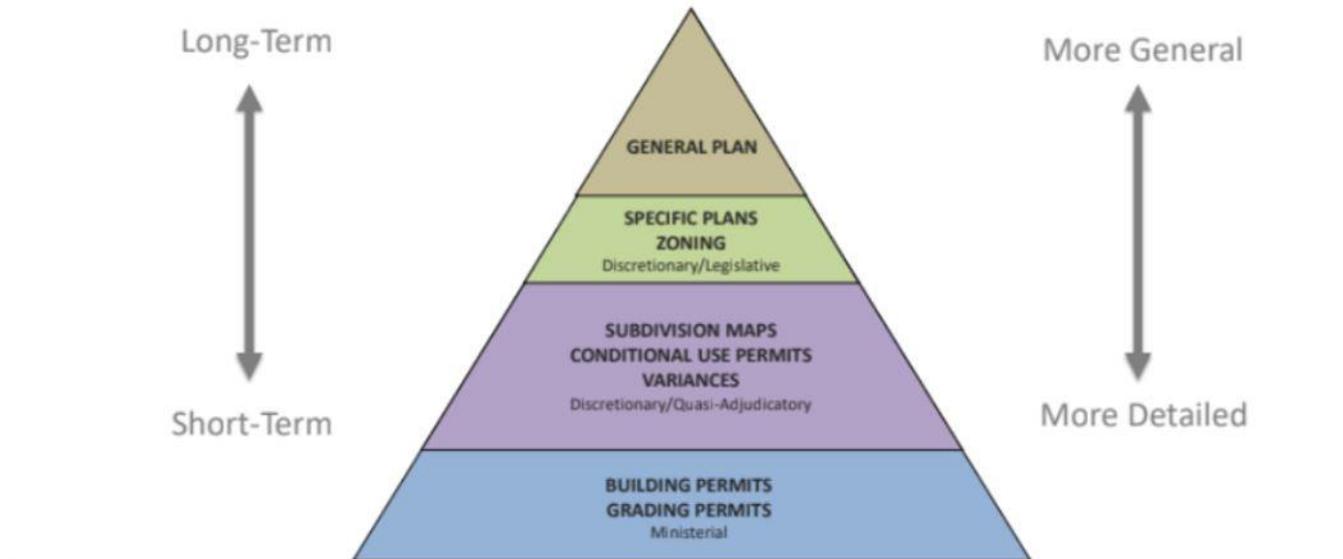
The California MUTCD has specific guidance on Rail and Light Rail crossings. See Part 8 of the California MUTCD.

**Figure 1003.5**  
**Railroad Crossing Class I Bikeway**



NOTE:  
See Index 403.3 Angle of Intersection for Class II and Class III facilities.

## Land Use Planning Hierarchy



Source: The Greenlighting Institute

**General Plan Policies That Support  
Active Transportation**

**Land Use Element Policies**

- 1.1.4 Provide adequate transportation (vehicle, bicycle, and pedestrian) and utility (sewer, water, energy, etc.) infrastructure and public services (police, fire, schools, etc.) to support the needs of the residents and businesses of American Canyon. *(I 1.4, I 1.5, I 1.8- I 1.13, I 1.15, and I 1.17)*
- 1.11.4 Require that land use and site design techniques be employed that achieve an integration of uses and sense of neighborhood and community, avoiding the character of undifferentiated residential tracts, based upon consideration of the following:
- a. establishment of a street pattern based on interconnecting streets that create a pattern of blocks rather than cul-de-sacs, to the extent permitted by topography, property configurations, and policies for environmental resource management and hillside preservation; establishment of a common gathering or activity center within a reasonable walking distance of residential neighborhoods, which may contain services (such as child- or elder-care), recreation, public meeting rooms, recreational facilities, small commercial uses, or similar facilities;
  - f. siting of common facilities around a public park or plaza to encourage a high level of community activity;
  - g. establishment of a continuous network of sidewalks, pedestrian, bicycle, and equestrian trails, and other elements that link all community areas and provide linkages to adjacent neighborhoods and districts;
  - h. consideration of reduced street widths and/or curved streets to reduce automobile speed and achieve more intimate relationships between structures, to the extent feasible to maintain acceptable fire protection and traffic flows;
  - i. incorporation of extensive landscape along peripheral and interior streets, pedestrian, bicycle, and equestrian trails, and at key public places;
  - j. exclusion of walls around the site’s perimeter and primary streets, unless an extensive landscape setback or linear park is provided and walls are aesthetically designed (prohibiting standard slumpstone and concrete block). *(I 1.1, I 1.4-1.8, and I 1.11)*
- 1.11.6 Require that nonresidential structures and sites incorporated in “planned” communities (e.g., recreation facilities, community meeting rooms and auditoriums, neighborhood commercial, services, and religious facilities) be designed to be compatible with and convey the visual and physical scale and character of residential structures. These should be linked by pedestrian walkways, bicycle paths, and other elements. *(I 1.1, I 1.4- I 1.6, I 1.11, and I 1.12)*
- 1.14.3 Require that (commercial) development be designed to convey a local neighborhood, “village” environment in accordance with Policies 1.18.1 to 1.18.5 and the following:

- a. buildings should be low-rise and pedestrian-oriented;
  - b. buildings should be sited on common sidewalks, pedestrian areas, and bicycle paths that are connected with surrounding residential communities;
- 1.18.2 Require that multi-tenant and large scale commercial development be sited and designed to convey a “village” environment in accordance with the following: linkage of individual structures and storefronts by establishing common building “walls” along pedestrian sidewalks, plazas, and other open spaces;
- c. siting of a portion of the buildings along the primary street frontage, with parking partially or fully screened by the buildings;
  - g. provision of pedestrian and bicycle paths to adjacent districts and neighborhoods. (*1.1, 1.4-1.7, 1.11, and 1.14*)
- 1.19.11 Ensure that the Town Center is a sustainable, “green” development through the implementation of such features as:
- d. pedestrian and bicycle circulation system
  - e. mix of land uses which reduce travel
- 1.19.12 Require that the Town Center Core Area provide a pedestrian-oriented, “village” environment, including a plaza or town square as a gathering place for community activities.
- 1.19.13 Require the implementation of public streetscape improvements that uniquely identify the Town Center, including elements such as landscape, street furniture, signage, and lighting; public street sections may vary from citywide standards in order to create this unique identity.
- 1.37.4 Reduce vehicle miles travelled by encouraging future land uses that feature a compact mixed-use urban form connected with pedestrian and bicycle trails.

## Circulation Element Policies

Vision: The core value of this Circulation Element is to provide safe and easy travel within and through the City for pedestrians, bicyclists and motor vehicles correlated with the Land Use Element.

**1.1 Community Priorities.** Safe and convenient access to activities in the community is provided by a well-designed local roadway system. That system serves the community's primary need for mobility and includes a planned hierarchy of roadways to meet that need. The following Community Priorities relate most directly to this Element:

- Encourage and foster a strong sense of community and safety, as well as the "home town" feeling by creation of a town center through land use and circulation planning.
- Improve a hierarchy of roadway networks to achieve and maintain acceptable traffic LOS and provide a Citywide system of bicycle lanes and recreational trails that improve accessibility without the use of an automobile.
- Improve SR 29 so that it serves as a visually attractive gateway into the City while providing access to commercial businesses and serving intra and inter-regional traffic and goods movement.

**1.5 Neighborhood Context.** Support safe, complete and well-connected neighborhood street, bicycle, and pedestrian access and connections that balance circulation needs with the neighborhood context.

**1.7 Complete Streets.** Maintain and update street standards that provide for the design, construction, and maintenance of "Complete Streets." The City's Complete Streets shall enable safe, comfortable, and attractive access for all users: pedestrians, motorists, bicyclists, and transit riders of all ages and abilities, in a form that is compatible with and complementary to adjacent land uses, and promotes connectivity between uses and areas. This policy, and Circulation Element as a whole, is consistent with the City's adopted Resolution 2012-72, "Complete Streets Policy of the City of American Canyon" that set out Principles, Implementation Objectives, and Exemptions to achieving Complete Streets.

**1.19 Complete Streets.** When constructing or modifying transportation facilities, consistent with Resolution 2012-72, "Complete Streets Policy of the City of American Canyon", strive to provide for the movement of vehicles, commercial trucks, alternative and low energy vehicles, transit, bicyclists and pedestrians appropriate for the road classification and adjacent land use.

- Update the Capital Improvement Program annually to incorporate necessary circulation system improvements.
- Evaluate projects to ensure that the safety, comfort, and convenience of pedestrians, bicyclists and transit users are given equal level of consideration to motor vehicle operators.
- Consider ways to increase and improve travel choices when reviewing development or transportation infrastructure projects.
- Consider roundabouts or other innovative designs as alternatives to stop signs and traffic signals when studying intersection configuration options.
- Require sidewalks on all arterial and collector streets. Where feasible, separate sidewalks from streets on arterials and collectors with landscaping including a tree canopy to create shade.
- Improve the existing street network to minimize travel times and improve mobility for transit,

bicycle, and walking trips between new projects and surrounding land uses to reduce vehicle trips.

- Initiate modification of the General Plan Land Use Element to clearly require new development to bear responsibility for their proportional impact on emergency services.

**1.20 Neighborhood Context.** Plan for safe, complete, well connected neighborhood streets.

- Modify the existing street network, where possible, to enable direct physical connections within and between neighborhoods, neighborhood-commercial areas, and commercial-commercial areas, including connections accessible only by pedestrians and bicycles on existing cul-de-sac streets.
- Provide direct connection from residential areas to neighborhood parks and open space.
- Where feasible, provide pedestrian crosswalks on all intersection approaches.
- Implement an ADA Transition Plan that focuses on compliant sidewalk improvements that provide continuous pedestrian and wheelchair access where compatible with the surrounding area.
- Develop and implement a Pedestrian Master Plan (PMP) that indicates which streets in addition to arterials and collectors will install sidewalks and what other pedestrian facilities and amenities (such as 'resting spots') are needed to complete the pedestrian network. Sidewalk widths and shade coverage should also be addressed in the context of the adjacent land use, vehicle volumes, and vehicle speeds.
- Maintain and update the Bikeway Master Plan (BMP) and work to fund and complete the planned bikeway system.
- Maintain and complete implementation of the Safe Routes to School Plan. This effort should complement the ADA Transition Plan, the PMP, and the BMP.

**1.21 Follow adopted City standards.** Build arterials, collector and local streets in accordance with adopted City standards. Improve existing facilities to conform to classification standards where possible. Exceptions to the standards may be allowed by the City Engineer where mitigation is infeasible or would conflict with other community values such as those listed below:

- Impacts on general safety, particularly pedestrian, bicycle, and transit safety;
- The right-of-way needs and the physical impacts on surrounding private or public properties;
- The visual aesthetics of the required improvement and its impact on community identity and character;
- Environmental impacts including air quality and noise impacts; and,
- Impacts on quality of life as perceived by residents.

**1.25 Traffic Calming.** Traffic calming techniques may be employed to mitigate the traffic effects of new development on minor and major collector streets. Use the City adopted Traffic Calming Guidelines for application and design of traffic calming measures.

**1.35 General transit and pedestrian access.** In reviewing designs of proposed developments, ensure that provision is made for access to current and future public transit services. In particular, pedestrian access to arterial and collector streets from subdivisions should not be impeded by continuous segments of sound walls.

## PEDESTRIAN AND BICYCLE ROUTES

The City is ideally situated for recreational trail use, with scenic landscapes a short distance away to the east, west, and north. The City adopted a Bicycle Plan in August 2012. The Bicycle Plan was prepared in accordance with the California Bicycle Transportation Act as part of the Napa Countywide Bicycle Plan and was coordinated with existing City and Regional Plans at the time of its adoption including the 2005 South County SR 29 Corridor Study and the Draft Parks and Community Services Master Plan. The Bicycle Plan adoption is one of several City actions implementing SB 375, the Sustainable Communities Strategy Act.

The goal of this local and regional planning effort is to interconnect the surrounding communities in the County with a seamless bicycle network for recreational and commuter use. The plan includes proposed bicycle and pedestrian trails, as well as on-street bicycle facilities to complete the partial network already in place in the City and County. The plan encourages the use of walking and bicycling and recognizes three classes of bikeways:

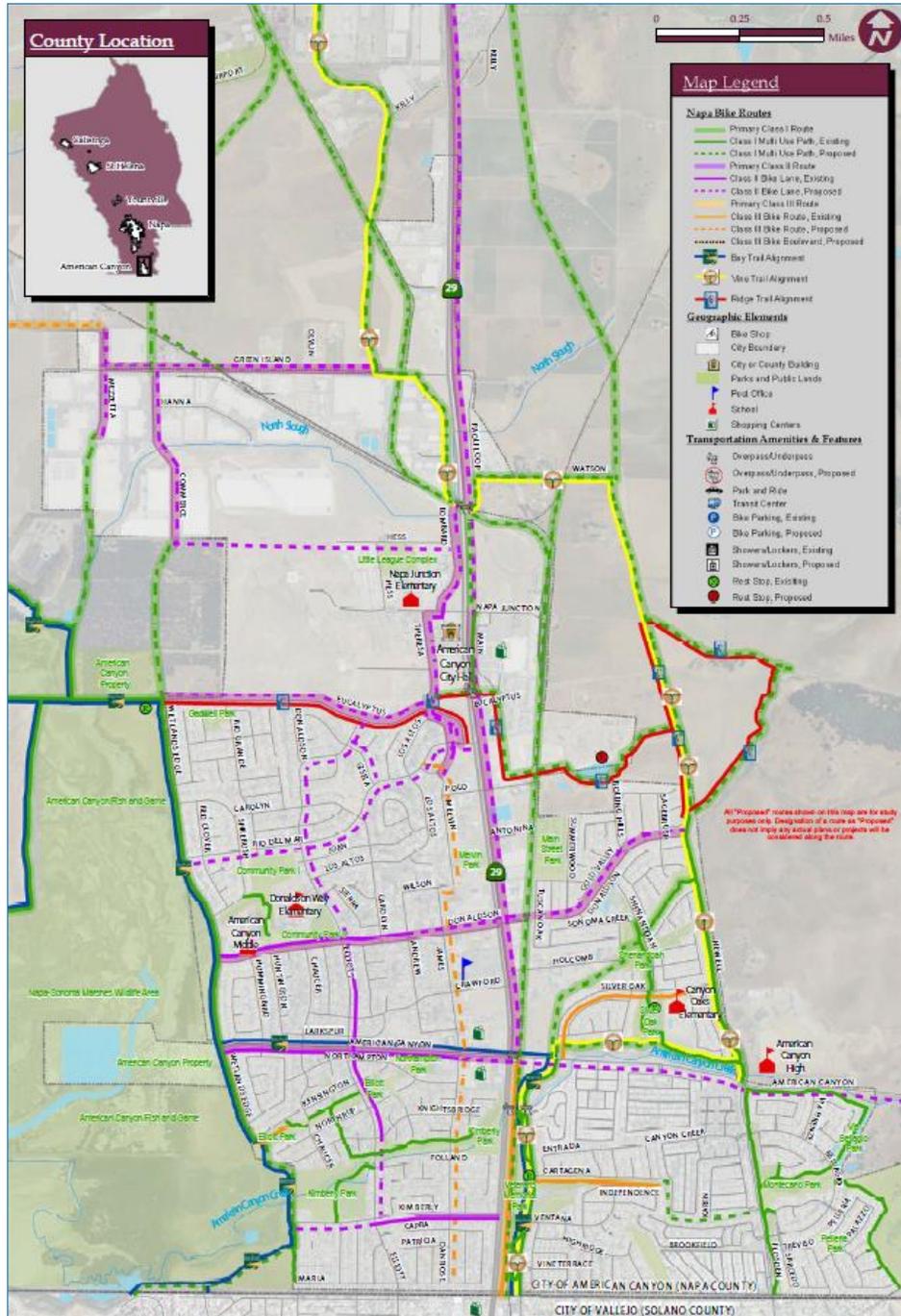
**Class I Multi Use Path.** Typically known as bike paths, Class I facilities are multi-use facilities that provide a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.

**Class II Bike Lane.** Known as bike lanes, Class II facilities provide a striped and signed lane for one-way bicycle travel on each side of a street or highway. The minimum width for bike lanes ranges between four and five feet depending upon the edge of roadway conditions (curbs). Bike lanes are demarcated by a six-inch white stripe, signage and pavement legends.

**Class III Bike Route.** Known as bike routes, Class III facilities provide signs for shared use with motor vehicles within the same travel lane on a street or highway. Bike routes may be enhanced with warning or guide signs and shared lane marking pavement stencils. While Class III routes do not provide measures of separation, they have an important function in providing continuity to the bikeway network.

Currently, facilities separated from vehicular traffic in the City include a discontinuous network of recreational pathways located throughout the community in City parks and on the American Canyon Creek corridor, a north-south Class I facility along Flosden Road and Newell Drive, a pathway on Wetlands Edge Road, and a segment of the Bay Trail which runs north-south on the City's west side. Class II bike lanes are provided on Elliot Drive, Broadway Street, Benton Way, Donaldson Way, American Canyon Road, and Kimberly Drive. The City does not currently have any Class III bike routes designated on City streets. Figure 5 illustrates the City's Bicycle Plan including existing and proposed bike routes.

FIGURE 5:  
AMERICAN CANYON BICYCLE PLAN



## 2. BICYCLE AND PEDESTRIAN POLICIES

### GUIDING POLICIES

- 2.1 Promote walking and bicycling.** Promote walking and bike riding for transportation, recreation, and improvement of public and environmental health.
- 2.2 Meet the needs of all users.** Recognize and meet the mobility needs of persons using wheelchairs and those with other mobility limitations.
- 2.3 Develop a safe and efficient non-motorized circulation system.** Provide safe and direct pedestrian routes and bikeways between places.

### IMPLEMENTING POLICIES

#### *Complete Streets*

- 2.4 Integration of land use planning.** Implement land use policies designed to create a pattern of activity that makes it easy to shop, play, visit friends, and conduct personal business without driving.
- 2.5 Provision of bicycle facilities.** Facilities for bicycle travel (Class I bike/multiuse paths; Class II bike lanes, and Class III bike routes) shall be provided to complete a continuous system of cyclists as shown on Figure 5.

Bike lane width shall follow State standards. In cases where existing right of way constraints limit development of Class II facilities, Class III signage and demarcation may be permitted at the discretion of the City Engineer. Deviations from these standards and from the routing shown on the diagram shall be permitted with the approval of the City Engineer.

- 2.6 Street trees for shade and comfort.** Ensure that planting plans for street trees take into consideration shade and comfort for pedestrians and bicyclists and traffic calming benefits.
- 2.7 Universal design.** Provide pedestrian facilities that are accessible to persons with disabilities and ensure that roadway improvement projects address accessibility by using universal design concepts.

#### *Funding for Improvements*

- 2.8 Funding for bikeways through street construction funds.** Continue to designate a portion of the City's annual street construction and improvement fund for financing bikeway design and construction.
- 2.9 Bicycle Plan.** Ensure that the City Bicycle Plan maintains consistency with the requirements in the Streets and Highways Code in order to be eligible for further funding for improvements from the State, such as the Bicycle Transportation Account funds.
- 2.10 Street trees in Capital Improvement Program (CIP).** Include street trees as part of project design and include in the City's CIP programming and implementation.

- 2.11 Funding for Bicycle Plan through TIF.** Include funding for the City’s Bicycle Plan updates and bikeway improvements consistent with the Bicycle Plan in the City’s TIF recognizing the multi-modal travel needs of the City.

### *Increasing Bicycle Use and Safety*

- 2.12 Bicycle use by City employees.** Establish a program to encourage bicycle use among City employees.

- 2.13 Bicycling access to parks.** Provide safe bicycle access to and parking facilities at all community parks.

- 2.14 Bicycle safety.** Increase the safety of those traveling by bicycle by:

- Sweeping debris from and repairing bicycle paths and lanes;
- Ensuring that bikeways are delineated and signed according to Caltrans or City standards, and that lighting is provided where needed;
- Providing bicycle paths and lanes on bridges and overpasses;
- Ensuring that all new and improved streets have bicycle-safe drainage grates and are free of hazards such as uneven pavement or gravel;
- Providing adequate signage and markings warning vehicular traffic of the existence of merging or crossing bicycle traffic where bike routes and paths make transitions into or across roadways; and
- Work with the Napa Valley Unified School District to promote classes on bicycle safety in the schools.

- 2.15 Demarcation of Class III Bikeways.** In order to increase awareness of bicyclists sharing the roadway with motorized vehicles, demarcate Class III bicycle facilities, where appropriate, by painting “sharrows” on streets. Because of high maintenance costs associated with sharrows, their use should be prioritized on areas with higher frequency of bicycle conflicts or where the bikeway may be obscured by traffic or geometrics. At minimum, Bike Route signage should be provided to identify and guide cyclists in using the City’s bikeway system.

- 2.16 Improved bikeway visibility.** Use visual cues, such as brightly-colored paint on bike lanes or a one-foot painted buffer strip, along bicycle routes to provide a visual signal to drivers to watch out for bicyclists and nurture a “share the lane” ethic. Prioritize using areas of town where automobile-bicycle collisions have occurred in the past, based on data from the Statewide Integrated Traffic Records System maintained by the California Highway Patrol.

### *Pedestrian Access and Comfort*

- 2.17 Pedestrian access to shopping destinations.** Install clearly marked crosswalks at intersections near all commercial uses, as well as clearly marked pedestrian paths within parking areas. Mid-block crossings are discouraged. However, if conditions warrant and are approved by City Engineer, crosswalks and signage indicating pedestrian activity should be installed at mid-block entrances where existing commercial uses are adjacent to other high-intensity uses, such as parks

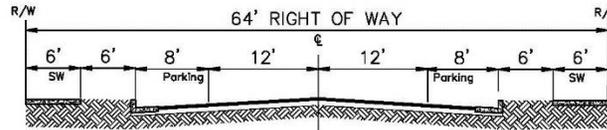
and schools where necessary for safety. Where possible, route pedestrians to grade separated crossings over State Route 29.

**2.18 Pedestrian connections to employment destinations.** Encourage the development of a network of continuous walkways within new commercial, town center, public, and industrial uses to improve workers' ability to walk safely around, to, and from their workplaces. Where possible, route pedestrians to grade separated crossings over State Route 29.

**2.19 Pedestrian connections to schools.** Continue developing the existing network of walkways between schools and residential uses, and encourage the development of new continuous walkways between schools and residential uses. Where possible, route pedestrians to grade separated crossings over State Route 29.

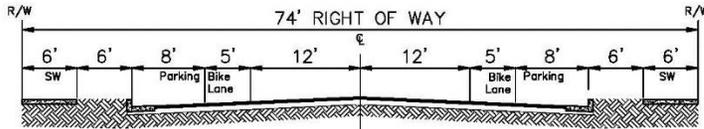
**2.20 Bicycle Master Plan.** The NCTPA Countywide Bicycle Master Plan for the City of American Canyon, as it may be amended from time to time, links all community centers, civic areas, schools, and parks in the City and connects to other neighboring bikeway networks. This plan is hereby incorporated by reference into the City of American Canyon General Plan.

General Plan Circulation Element  
Standard Roadway Cross Sections



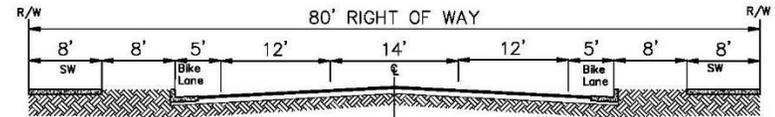
**LOCAL STREET  
(RESIDENTIAL)**

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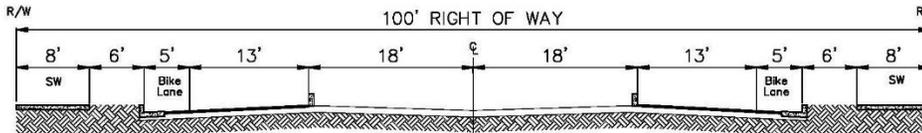
**MINOR COLLECTOR**

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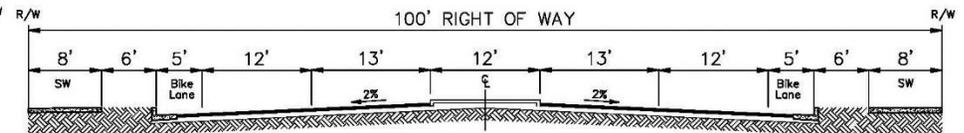
**MAJOR COLLECTOR  
AND INDUSTRIAL  
COLLECTOR**

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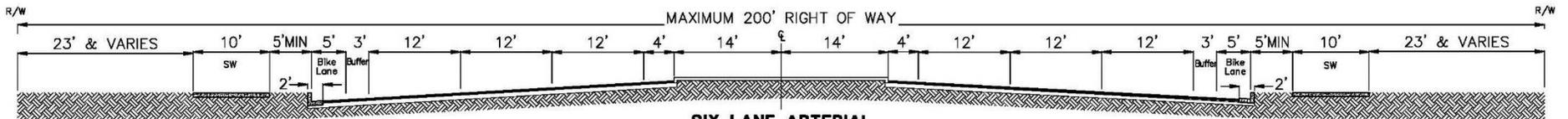
**TWO-LANE ARTERIAL  
(INTERIM)**

NOT TO SCALE



**FOUR-LANE ARTERIAL**

NOT TO SCALE



**SIX LANE ARTERIAL  
(EIGHT LANE ARTERIAL POTENTIAL)**

NOT TO SCALE

# Napa Countywide Bicycle Plan



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# Table of Contents

Acknowledgements .....	2
Chapter 1: Introduction .....	7
County Context .....	7
How was this Plan developed? .....	8
Plan Organization .....	13
Chapter 2: Goals and Policies.....	14
Countywide Vision and Goals .....	14
Serving All Types of Bicyclists.....	15
Level of Traffic Stress (LTS) .....	16
Relationship to Existing Plans and Policies .....	17
Chapter 3: Existing Bicycling Environment .....	19
Context for Bicycling .....	19
Characteristics of Bike Trips.....	20
Collision Trends.....	24
Demographics .....	31
Bicycle Facilities and Network.....	33
Bicycle Programs .....	47
Key Opportunities .....	49
Chapter 4: Proposed Bicycle Network and Programs .....	50
How the Network was Developed .....	50
Proposed Bicycle Network .....	51
Proposed Support Programs and Policies.....	58
Performance Measures.....	59
Chapter 5: Implementation Strategy .....	61
Implementation Methods.....	61
Project Phasing.....	64
Cost Estimation .....	66
Funding Opportunities .....	67

Chapter 6: City of Calistoga Bicycle Plan.....	70
Section 1: Introduction .....	70
Section 2: Goals and Policies.....	72
Section 3: Existing Bicycle Network .....	75
Section 4: Proposed Bicycle Network .....	83
Section 5: Support Programs and Policies .....	85
Section 6: Implementation Plan.....	87
Chapter 7: City of St. Helena Bicycle Plan.....	91
Section 1: Introduction .....	91
Section 2: Goals and Policies.....	93
Section 3: Existing Bicycle Network .....	96
Section 4: Proposed Bicycle Network .....	106
Section 5: Support Programs and Policies .....	108
Section 6: Implementation Plan.....	111
Chapter 8: Town of Yountville Bicycle Plan .....	116
Section 1: Introduction .....	116
Section 2: Goals and Policies.....	118
Section 3: Existing Bicycle Network .....	121
Section 4: Proposed Bicycle Network .....	129
Section 5: Support Programs and Policies .....	131
Section 6: Implementation Plan.....	133
Chapter 9: City of Napa Bicycle Plan .....	136
Section 1: Introduction.....	136
Section 2: Goals and Policies .....	138
Section 3: Existing Bicycle Network.....	142
Section 4: Proposed Bicycle Network .....	157
Section 5: Support Programs And Policies .....	162
Section 6: Implementation Plan.....	165

Chapter 10: City of American Canyon Bicycle Plan.....	171
Section 1: Introduction .....	171
Section 2: Goals and Policies.....	173
Section 3: Existing Bicycle Network .....	176
Section 4: Proposed Bicycle Network .....	185
Section 5: Support Programs and Policies .....	187
Section 6: Implementation Plan.....	189
Chapter 11: Unincorporated Napa County Bicycle Plan .....	193
Section 1: Introduction .....	193
Section 2: Goals and Policies.....	195
Section 3: Existing Bicycle Network .....	197
Section 4: Proposed Bicycle Network .....	217
Section 5: Support Programs and Policies .....	223
Section 6: Implementation Plan.....	225

## Chapter 1: Introduction

The Napa Valley Transportation Authority (NVTA) and the jurisdictions of Napa County are seeking to improve the bicycling environment for all residents and visitors by identifying key infrastructure, programs, and policies in this plan. The first countywide bicycle plan was adopted in 2003, and the most recent update was made in 2012. The 2019 Napa Countywide Bicycle Plan (referred to as the “Plan”) builds upon the bicycle recommendations presented in the 2012 Napa Countywide Bicycle Plan. The field of bicycle planning and design has changed significantly in the last seven years, and this Plan incorporates those current best practices. This Plan approaches the bicycling environment with an eye toward making bicycling possible for a large part of the population, not only those who already ride or are already comfortable riding in most traffic conditions.

New funding sources at the county, regional, and state scale have become available for projects and programs in the last few years. For example, local jurisdictions have a great opportunity for implementing bicycle facilities as part of road resurfacing and rehabilitation projects under Measure T, a local ½ cent sales tax measure for streets and roads rehabilitation, repair and maintenance. The Equivalent Funds (equal to 6.67% of annual Measure T revenue from other non-competitive sources) countywide collective match for shared-use paths (Class I bicycle facilities), provides the opportunity for implementing off-street trails, providing increased safety and connectivity. This Plan can help jurisdiction staff pursue funding and coordinate other planned projects with bicycle infrastructure to efficiently build out the bicycle network.

Bicycling is an important part of the Napa Valley landscape. Residents use bikes to get to destinations throughout the county, whether to work, or to school and shopping. The County’s beautiful rural roads attract recreational bicyclists for group rides and events. Residents and visitors also take advantage of the Vine Trail to enjoy a relaxed, off-street ride for recreation or transportation. When completed, the Vine Trail will form a fully connected north-south active transportation corridor through the Napa Valley, from Calistoga to the Vallejo Ferry Terminal in Solano County. Planning and construction of the Vine Trail brings together staff from jurisdictions throughout the county, private land owners, and dedicated advocates. Partnership is also key in the county’s Safe Routes to School program.

This foundation of cooperation will serve NVTA, jurisdiction staff, and community stakeholders well as they move forward together to implement the recommendations of this Plan. Improving the bicycling environment will help more people choose to bike on the streets and trails of Napa County, ultimately serving NVTA’s goals for countywide transportation: reducing growth in vehicle miles traveled, shifting travel from single occupancy vehicles to other modes, and reducing energy use and GHG emissions and congestion.

## COUNTY CONTEXT

Napa County is located in the northern San Francisco Bay Area. As a world-famous wine-producing region, the County has several million visitors annually and is characterized by numerous wineries and vineyards, restaurants, and other tourist destinations. The primary land use is agricultural and outdoor activities such as hiking, mountain biking, and walking or biking along the Napa Valley Vine Trail are

popular with both residents and visitors. The region’s temperate climate makes these outdoor activities accessible nearly year-round.

Napa County includes six jurisdictions: The City of American Canyon located in the southern portion of the Valley; the City of Napa is the largest jurisdiction and is in central Napa Valley; The Town of Yountville, City of St. Helena, and City of Calistoga in northern Napa Valley. Napa County is predominantly rural, and the unincorporated areas outside of the jurisdictions are managed by the County. The County and local jurisdictions have installed a variety of bicycle facility types; however, the overall bicycle network is primarily comprised of bicycle lanes (Class II) and bicycle routes (Class III).

## HOW WAS THIS PLAN DEVELOPED?

This update to the 2012 Napa Countywide Bicycle Plan began in May 2017 and is the culmination of a year and a half of community engagement paired with a data-driven analysis of existing conditions and needs. The engagement and analysis informed the development of the 2019 goals, policies, network approach, and bicycle facility recommendations.

The process to develop this Plan included many stakeholders. The development of the Plan was initiated and managed by the **Napa Valley Transportation Authority (NVTa)**. Several additional entities provided valuable input into the plan development process including:

- Staff from the **Cities of American Canyon, Napa, St. Helena, and Calistoga, the Town of Yountville, and Napa County** (referred to as the “jurisdictions”) provided strategic guidance on the existing conditions analysis and bicycle network approach and development.
- The **Napa County Bicycle Coalition**, the bicycle advocacy organization for Napa Valley and partner organization for the Napa County Safe Routes to School program, assisted in organizing bicycling field visits in each jurisdiction for the project team. The organization encouraged participation in online tools, participation in outreach events, and provided valuable input on the proposed bicycle network.
- The **Napa Valley Vine Trail Coalition (NVVTC)** is a nonprofit organization focused on raising funds and awareness of a 47-mile active transportation corridor currently under development that will connect the Vallejo Ferry Terminal in Solano County to Calistoga in northern Napa County (see Figure 1.1). NVVTC offered important guidance on the Vine Trail.



Figure 1.1. Bicyclists on the Napa Valley Vine Trail in the City of Napa

- The **NVTA Active Transportation Advisory Committee**, NVTA’s primary committee advising the NVTA Board on active transportation matters was instrumental in providing feedback and review of the Plan throughout the planning process.
- The City of Napa **Bicycle and Trails Advisory Commission**, A group with extensive knowledge of the current bicycle network, programs and policies, provided important review and feedback for the Plan.

### *Public Input Summary*

Throughout the process, NVTA sought ideas from the community on current bicycling conditions and needed improvements. Several common themes and priorities emerged from the community’s feedback, including a desire for:

- Well-maintained bikeways suitable for a wide range of riders
- Connections to schools, parks, trails, and commercial areas
- Recreational bikeways along rural routes
- Effective signal detection for bicycles
- Colored paint for bicycle lanes<sup>1</sup>
- Appropriate bicycle infrastructure on roadways, especially those with high speed and traffic volumes

The community’s input was essential to ensuring the Plan’s recommendations meet the needs of Napa Valley residents. Highlights of the outreach efforts are discussed in this section. Additional information can be found in the individual jurisdiction plans (see Chapters 6-11) and Appendix B: Community Outreach Summary.

### **Online Outreach**

NVTA launched an online interactive map, called a “WikiMap,” to gather input about the existing bicycle network. The WikiMap was available from July to October 2017. Users were asked to identify routes they already ride, where they would like to ride, and any barriers to biking.

The map, shown in Figure 1.2, was created for the entire county, and respondents could zoom to comment on specific jurisdictions. The map was available as a link from the project webpage and participation was encouraged through public outreach events. Community members provided just over 200 map comments, entering valuable input about the state of bicycling in Napa County and specific areas to address in this Plan.

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<sup>1</sup> See Appendix A: Facility Design Toolkit for discussion of using colored paint to denote conflict areas.

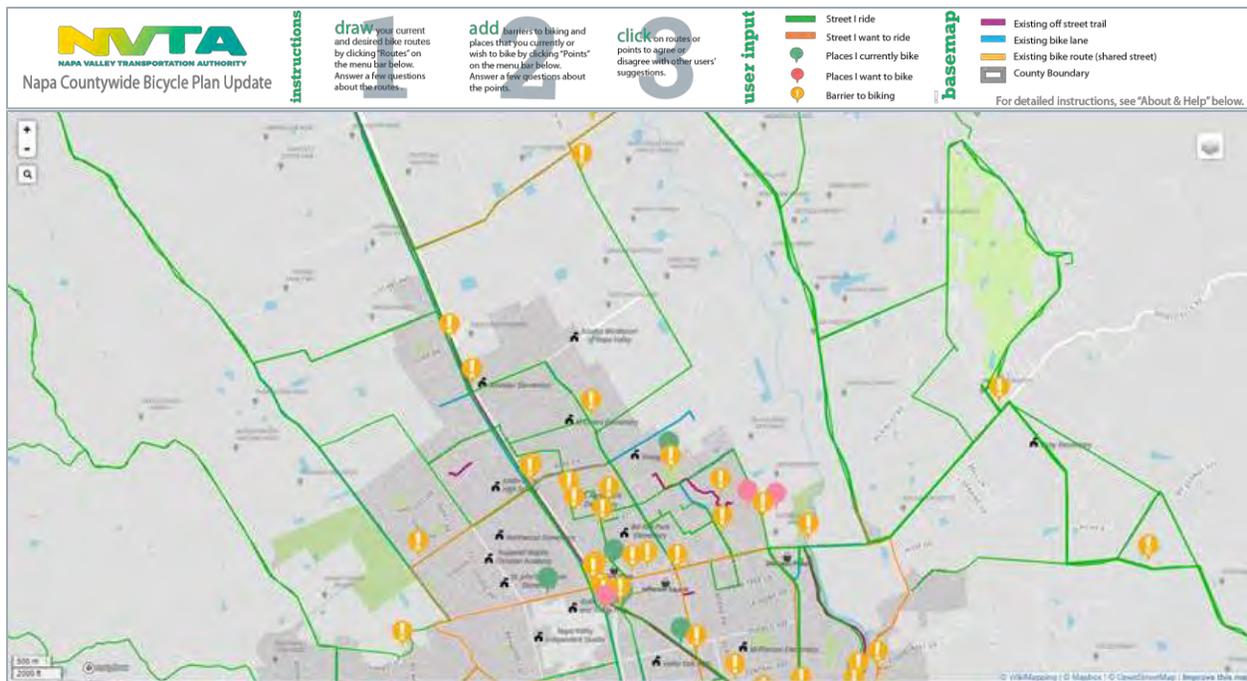


Figure 1.2. Online WikiMap interface

In addition to the initial WikiMap, NVRTA also hosted an online map for residents to review the recommended bicycle network facilities. This map showed draft recommended bike facilities throughout the county and allowed users to agree or disagree that the recommendation was appropriate in that location. Approximately 330 comments were received and reviewed by staff in each jurisdiction for possible changes to the recommended network.

### Community Outreach Events

Several community outreach events were held to solicit input on existing and proposed facilities and share ideas. The first event was held at the **Napa PorchFest** on July 30, 2017, in the City of Napa. Attendees shared feedback on the existing conditions maps and participated in a “What Type of Rider Are You” activity. This activity asked participants to self-identify as one of four types of riders: Interested but Concerned, Enthused and Confident, Strong and Fearless, or Not Interested or Able. This spurred community members to think about their own individual approaches to bicycling and enabled the project team to get a snapshot of the Napa Valley population and its composition with respect to bicycling. Different types of bicyclists, or bicyclists-to-be, require different types of infrastructure to choose bicycling for their trip.

The second event was held as a part of **BikeFest**, an annual event sponsored by the Napa County Bicycle Coalition, on May 5, 2018, at the Oxbow Commons in the City of Napa. During the event, participants were invited to “Build their Own Street” by choosing different foam-board components, such as bike lanes, sidewalks, medians, and roadways (see Figure 1.3). This activity helped participants consider the tradeoffs of dedicating space to different modes or uses and allowed them to express their priorities.



Figure 1.3. A family participating in the “Build Your Own Street” activity at the BikeFest event in the city of Napa.

Through a dot voting exercise, over 70 participants shared their priorities for the bicycle network (see Figure 1.4).

The most important priority was high-quality, high-comfort bikeways; bikeways that connect to schools, parks, and trails and recreational bikeways along rural roads tied as the second most important. Respondents also indicated that bikeways that connect to commercial areas were very important.

Other common themes and interests included:

- Installing bicycle detection at signals
- Installing green paint in conflict areas
- Improving safety
- Installing separated bikeways on high-speed, high-volume streets, especially on or along major thoroughfares, rural streets, and neighborhood streets with speeding issues

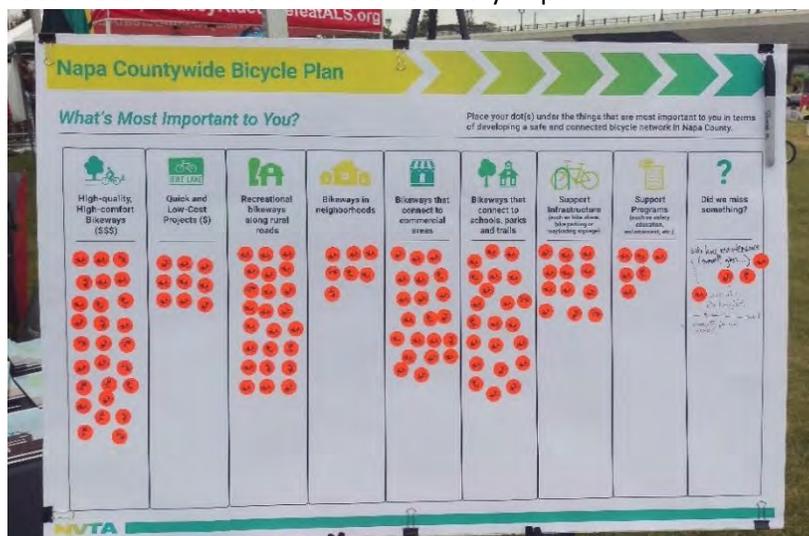


Figure 1.4. Responses to “What’s Most Important to You?”

NVTA staff held an open house event on June 19, 2018 to seek feedback about draft bikeway network recommendations. Attendees reviewed the plan process to date, viewed a presentation of current best practices in bicycle facilities planning (see Figures 1.5 and 1.6), and provided comments on the proposed network.



Figure 1.5 NVTA Bike Plan Open House



Figure 1.6 NVTA Bike Plan Open House

### Committees

Throughout the process, three established NVTA committees provided guidance and feedback on the existing conditions, proposed bicycle network, and proposed support programs. These committees included:

- **Active Transportation Advisory Committee (ATAC)** - Focuses on bicycle and pedestrian issues throughout the county and includes 11 members who live or work within Napa County representing each jurisdiction within the County.
- **Citizens Advisory Committee (CAC)** - Composed of 19 members; six members are appointed by the elected boards of Napa County's jurisdictions: the cities of American Canyon, Calistoga, Napa and St. Helena; the Town of Yountville; and Napa County.
- **Technical Advisory Committee (TAC)** - Includes representatives from the Napa County Public Works Department and staff from each Napa County jurisdiction.

## PLAN ORGANIZATION

This Plan is organized into 11 chapters and nine appendices.

Chapter	Focus
<b>Chapter 1</b>	Introduction to the Plan
<b>Chapter 2</b>	Plan goals and policies and relationship to existing plans
<b>Chapter 3</b>	Existing bicycle environment in Napa County
<b>Chapter 4</b>	Countywide recommendations for bikeways and programs
<b>Chapter 5</b>	Implementation and funding strategy
<b>Chapter 6</b>	City of Calistoga Bicycle Plan
<b>Chapter 7</b>	City of St. Helena Bicycle Plan
<b>Chapter 8</b>	Town of Yountville Bicycle Plan
<b>Chapter 9</b>	City of Napa Bicycle Plan
<b>Chapter 10</b>	City of American Canyon Bicycle Plan
<b>Chapter 11</b>	Unincorporated Napa County Bicycle Plan
Appendix	Focus
<b>Appendix A</b>	Bicycle Facilities Toolkit, a guide for implementing bicycle facilities and improvements
<b>Appendix B</b>	Summary of the public and stakeholder engagement that guided the Plan recommendations
<b>Appendix C</b>	Overview of relevant plans and policies related to bicycling in Napa County
<b>Appendix D</b>	Strategies for developing a bicycle count program
<b>Appendix E</b>	Full list of Proposed Bicycle Network projects
<b>Appendix F</b>	Summary of the Plan’s fulfillment of Caltrans Active Transportation Program (ATP) grant requirements
<b>Appendix G</b>	Facility Cost Estimate Details
<b>Appendix H</b>	Level of Traffic Stress Methodology
<b>Appendix I</b>	Glossary of Terms
<b>Appendix J</b>	Resolution of Adoption of this Plan

# Chapter 2: Goals and Policies

## COUNTYWIDE VISION AND GOALS

The Countywide vision statement, goals, and policies were developed to guide the Plan recommendations and will be used to evaluate progress. These were collaboratively developed by NVTA staff, the NVTA Technical Advisory Committee (TAC), NVTA Active Transportation Advisory Committee (ATAC), City of Napa Bicycle and Trails Advisory Commission and the Napa County Bicycle Coalition.

### Vision Statement

Napa County’s vision is to be a bicycle-friendly community with a world-class bicycling system for all ages and abilities. The comprehensive, connected bicycle system will provide people with safe, convenient and enjoyable access to destinations throughout all Napa County jurisdictions and beyond. Residents and visitors will enjoy bicycling for everyday commuting, non-work trips and recreation. Bicycling contributes to a high quality of life, promotes health and will help achieve a 10 percent mode share in Napa County by 2035.

### Goals and Policies

The goals and policies developed for the 2019 Plan will guide Napa County communities in improving the bicycling environment for residents and visitors.

**Table 2.1. Goals and Policies of the Plan**

Goals		Policies
<b>Connectivity</b>	Develop a well-designed low Level of Traffic Stress (LTS) connected bicycle network	<ul style="list-style-type: none"> <li>• Build and maintain a local and countywide bicycle transportation and recreation network that connects Napa County’s incorporated cities/town and unincorporated communities and provides access to public transportation and community destinations.</li> <li>• Develop and maintain continuous low Level of Traffic Stress (LTS) bicycle facilities of all types to provide accessible intra-city connections that serve as the framework of the Countywide Bikeway System.</li> <li>• Prioritize coordination and completion of regionally significant primary bikeways including the Napa Valley Vine Trail, the Bay Trail and the Ridge Trail, and local connections to those facilities.</li> <li>• Provide secure bicycle parking at public and private destinations throughout Napa County.</li> <li>• Integrate the bicycle network and bicycle facility amenities into land use decisions and developments.</li> </ul>
<b>Equity</b>	Improve bicycle access for disadvantaged and/or underserved communities	<ul style="list-style-type: none"> <li>• Implement projects that improve access for disadvantaged and/or underserved communities, particularly those reliant on walking, biking and transit for transportation.</li> </ul>

Goals		Policies
<b>Safety</b>	Improve safety for all ages and abilities	<ul style="list-style-type: none"> <li>• Work to reduce the number and severity of bicycle collisions.</li> <li>• Work to reduce bicycle fatalities to zero by 2035.</li> <li>• Improve locations that have high incidences of bicycle collisions, and/or impediments or conflicts to bicyclists.</li> <li>• Implement Complete Streets policies that ensure accommodation and enable safe access for users of all ages and abilities.</li> <li>• Implement appropriate, well-designed bicycle facilities using accepted design standards, including intersection and other crossing improvements.</li> </ul>
<b>Education &amp; Encouragement</b>	Increase mode share of bicycling	<ul style="list-style-type: none"> <li>• Encourage education programs for all users of the roadway in all jurisdictions and school districts.</li> <li>• Develop programs and public outreach materials to promote safety and the positive benefits of bicycling.</li> </ul>

## SERVING ALL TYPES OF BICYCLISTS

Many factors contribute to people choosing to ride a bicycle, with a major factor being the rider’s perception of safety. A rider’s perception of an unsafe route can be related to numerous things but is most often related to riding adjacent to high-traffic and high-speed roadways or crossing busy intersections with little or no separation from vehicles. Research has found that a large percentage of the American population is interested in bicycling for transportation but does not currently do so because they believe the routes they would need to travel are unsafe or feel uncomfortable. Many people feel safer and more comfortable riding on low-traffic, low-speed streets or on facilities that provide protection or physical separation from fast-moving traffic.<sup>2</sup> Most people in the U.S. – between 50 and 60 percent – have little tolerance for interacting with motor vehicle traffic unless volumes and speeds are very low (see Figure 2.1).<sup>3</sup> This group of riders is referred to as “Interested but Concerned,” reflecting both their interest in bicycling for transportation as well as concerns about safety and comfort when interacting with motor vehicle traffic.

This framework of rider types was used to assess the existing bicycle network and to select recommended facility types for the 2019 Plan. This rider type has the highest potential for increasing bicycle mode share if facility types that support and encourage biking are available.

<sup>2</sup> Source: Dill, J. McNeil, N. “Revisiting the Four Types of Cyclists: Findings from a National Survey” Transportation Research Board 95<sup>th</sup> Annual Meeting, 2016.

<sup>3</sup> Studies, such as the one referenced above, show that approximately one third of the adult population is not currently interested in bicycling or able to bicycle.

## LEVEL OF TRAFFIC STRESS (LTS)

Bicycle planners and designers use Level of Traffic Stress (LTS) as the measure of a street’s suitability for Interested but Concerned riders and potential riders. LTS measures how people feel when they are bicycling. The proximity, volume and speed of traffic can impact how people feel while riding which means specific types of bicycle facilities are more appropriate to specific types of roads than others. For instance, a standard bike lane may have a low level of traffic stress for most riders when it’s on a 30mph street with fewer than 6,000 vehicles per day. That same bike lane on a 40mph street with more traffic volume will not be comfortable for many riders. When someone considers riding a bike for their trip, they may not choose to do so if part of their trip is on a “high-stress” street.

High-stress intersections can also prevent people from choosing to ride a bike. These are locations where a small street crosses a large one without traffic control for the major street. These locations interrupt an otherwise low-stress, comfortable ride by causing a rider to need to wait for a gap in traffic, gauge the speed of passing vehicles, and cross a longer distance while traffic is still proceeding, or perhaps detour a longer distance from their desired destination. Signalized intersections can also be stressful when bike lanes stop in advance of the intersection, or when they are located inappropriately to the right of a right turn lane.

To learn more about the Level of Traffic Stress Methodology and how LTS impacts connectivity, see Appendix H. This appendix includes a memo outlining how LTS is conducted, what assumptions were made for analysis in Napa County, and results from the low-stress connectivity analysis.

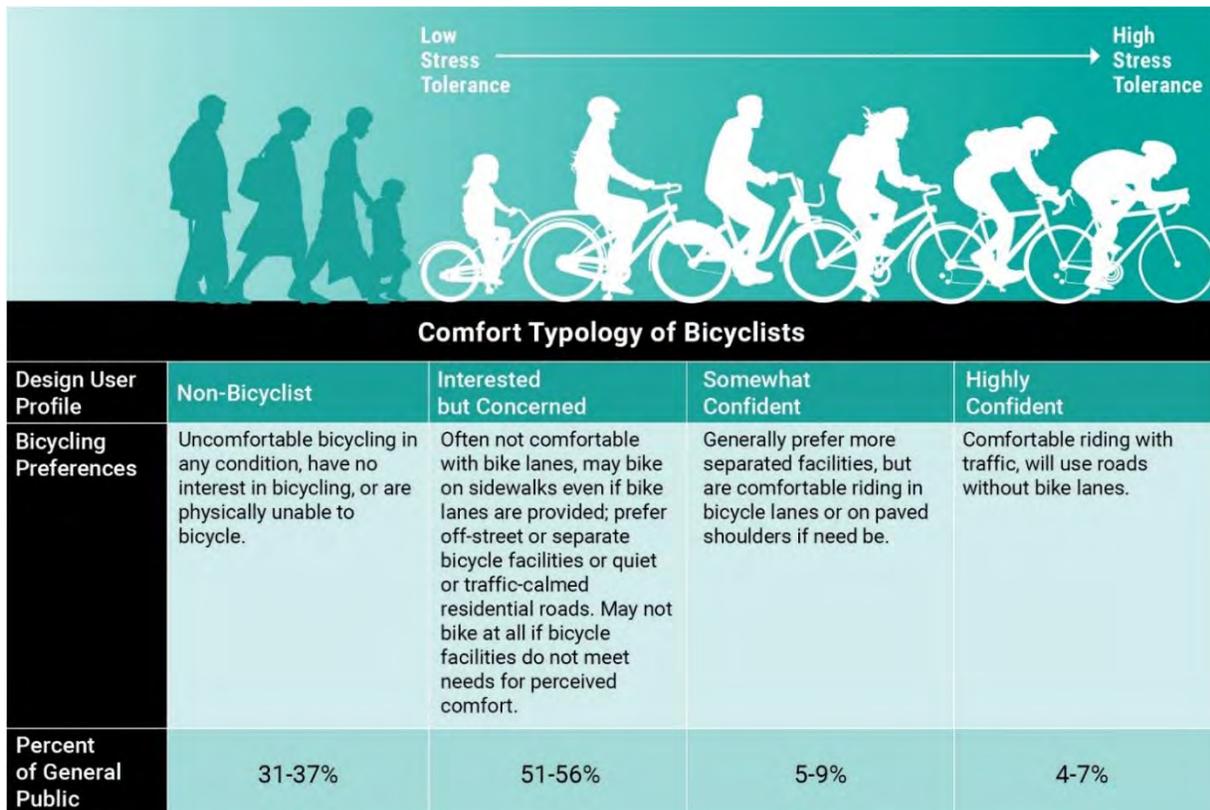


Figure 2.1 Types of Bicyclists and Level of Stress Tolerance

## RELATIONSHIP TO EXISTING PLANS AND POLICIES

Napa County and its jurisdictions have a host of adopted plans and policies that affect the County’s and jurisdictions’ bicycle projects, investments, and priorities. This section briefly summarizes key plans and policies. A full review of plans and policies and their relationship to this Plan can be found in Appendix C: Plans and Policies Review.

### *NVTA Countywide Transportation Plan (2014)*

The *Napa Countywide Transportation Plan – Vision 2040: Moving Napa Forward* is a long-range transportation plan that sets goals, strategies, and investments for all modes of transportation for the next 25 years. The Plan identifies a constrained transportation project list for the county, which includes 17 projects that specifically aim to improve bicycling in the county. The Plan also identifies linkages between expanding the bicycle network and programs (e.g., Safe Routes to School, Complete Streets, bikeshare, separating pedestrians and bicyclists from the roadway) and the broader economic development, transportation demand management, environmental, health, and placemaking goals for the county.

### *SR 29 Gateway Corridor Implementation Plan (2014)*

In 2014, NVTA created a vision and implementation plan for the southern section of State Route 29 (SR 29). This 17-mile segment of SR 29 is a “gateway” to Napa Valley as well as a regional corridor for pass-through traffic. The Plan includes options for increasing active transportation facilities within the SR 29 corridor. Currently, the corridor provides paved shoulders for bicycling in some sections. The Plan recommends bicycle facility improvements as shown in Table 2.2.

**Table 2.2. Bicycle Recommendations in the 2014 SR 29 Gateway Corridor Implementation Plan**

SR 29 Gateway Corridor Segment	Proposed Improvement
SR 37 to American Canyon Road	Shared-Use Path - Class Is, separated from automobile travel lanes by a landscape strip
Napa Junction Road to South Kelly Road	Shared-Use Path - Class Is, separated from automobile travel lanes by a landscape strip
American Canyon Road to Napa Junction Road	Two Options: 1. Bike Lane - Class IIs along the local access lanes 2. Modified boulevard concept that would continue the Class I paths
South of SR 37	Cycling access to Downtown Vallejo and the ferry terminal along Sonoma Blvd (facilities are specified in the Sonoma Blvd Specific Plan)
Between the Ferry Terminal and the SR 29/SR 37 intersection	Class I facilities along SR 37 and Harbor Drive
North of South Kelly Road	Improving to an 8’ shoulder (striped to Class II) in addition to improved access to the Vine Trail via Airport Blvd

### *Caltrans District 4 Bicycle Plan (2018)*

The 2018 Caltrans District 4 Bicycle Plan is a strategic planning document that identifies and prioritizes bicycle investments on State-owned transportation infrastructure. It is part of the statewide *Toward an*

*Active California* effort (see below), which seeks to improve multimodal access, improve health outcomes, and reduce traffic congestion, among other goals. In Napa County, projects are identified at intersections with and along state-owned roadways including SR 29, SR 12, SR121, SR 128, and SR 221.

### *Toward an Active California: State Bicycle + Pedestrian Plan (2017)*

*Toward an Active California: State Bicycle + Pedestrian Plan* offers a visionary and comprehensive policy to support active modes of transportation throughout the state. The Plan’s vision states that “by 2040, people in California of all ages, abilities, and incomes can safely, conveniently, and comfortably walk and bicycle for their transportation needs.” The plan focused on four areas of policy and recommendations:

- Safety: Reduce the number, rate, and severity of bicycle and pedestrian involved collisions
- Mobility: Increase walking and bicycling in California
- Preservation: Maintain a high-quality active transportation system
- Social Equity: Invest resources in communities that are most dependent on active transportation and transit

The Plan was released concurrently with major new funding from SB1 (Road Repair and Accountability Act of 2017), which provides an additional \$1 billion for investments over the next ten years.

## Chapter 3: Existing Bicycling Environment

This chapter provides an overview of bicycling conditions throughout Napa County, as well as localized efforts to support bicycling through policies and programs. This Plan’s recommendations for the bicycle network and support programs are drawn from the information analyzed and presented in this chapter.

### CONTEXT FOR BICYCLING

Napa County is predominantly rural, and the five cities and town of Napa County – American Canyon, Napa, Yountville, St. Helena, and Calistoga – hug the western area of the county and are located along State Routes 29 (SR 29) and 128 (SR 128) (See Figure 3.1 Jurisdictions of Napa County).

The City of Napa is the county seat and the largest city, with a population of approximately 80,000. As one of the older communities in the area, Napa has a traditional, dense downtown retail core with a grid of relatively narrow two-lane streets, and older neighborhoods nearby downtown with similar street patterns. It also has established suburban areas somewhat farther from downtown, which are characterized by low-density, residential land uses served by larger arterial-style streets.

The City of American Canyon is the second largest city in Napa County. The population is approximately 20,000, and most of its growth has occurred in the last 25 years, after the city’s incorporation in 1992. It is composed primarily of low-density single-family neighborhoods connected with wide multi-lane arterials.

American Canyon serves as a commuter community along SR 29, with some residents traveling to the larger employment centers of the central Bay Area for work. SR 29 bisects the City of American Canyon and creates barriers to permeability between the west and east sides of the roadway, especially for people walking and biking. While American Canyon currently lacks a traditional downtown, new developments along SR 29 are creating retail and entertainment destinations for the community, some with integrated residential development. Most of this new development housing is on the east side of SR 29, and older neighborhoods and industrial development are on the west side of the corridor.

The majority of the local workforce live in the cities of Napa and American Canyon and commute to the “Upper Valley” communities of Yountville, St. Helena, and Calistoga. The 2014 Napa Valley Travel

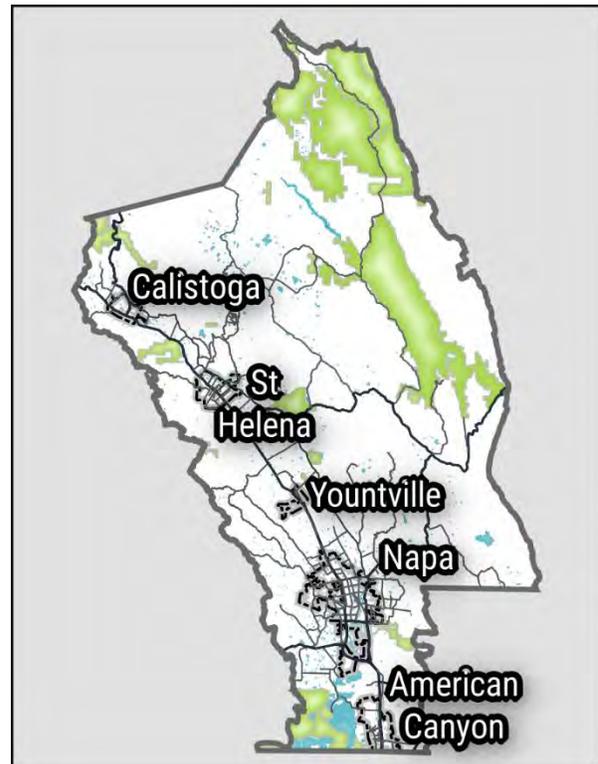


Figure 3.1. Jurisdictions of Napa County.

Behavior Study found that 55 percent of the study’s sample traveled within the county (both their origins and destinations were within Napa County).<sup>4</sup>

The Cities of Napa and American Canyon also have Napa County’s two Priority Development Areas (PDAs). PDAs are areas throughout the Bay Area region that were identified in Plan Bay Area<sup>5</sup> as candidates for sustainable residential and jobs growth, infill development, and investment. The PDA in the City of Napa is located in downtown and along Soscol Avenue between Imola Avenue and First Street, and the PDA in the City of American Canyon is located along State Route 29 between Green Island Road and the Solano County line.<sup>6</sup>

The Town of Yountville is home to 3,000 people (approximately 1,200 residents live at the Veterans Home of California in western Yountville), and is located five miles north of Napa off SR 29. It has a series of low-volume, low-speed streets connecting its residential areas to the commercial core along Washington Street.

The City of St. Helena is located 15 miles north of Napa in the heart of Napa Valley. It is a small city with a population of approximately 6,000. It is served by a network of low-volume local streets as well as SR 128/29, which is the main street through its downtown. St. Helena is predominantly residential, except for the areas immediately adjacent to SR 128/29, including a small industrial/office park at the southeast end of the city.

The City of Calistoga, at the north end of Napa Valley is a community of 5,000 people. Its small, traditional downtown is located on Lincoln Avenue (SR 29). Similar to St. Helena, the highway is the city’s main street. Narrow residential streets connect the city’s neighborhoods, though the Napa River creates a barrier between the north and south ends of town.

The unincorporated areas of Napa County are largely rural and agricultural with a few small communities, including Angwin and Pope Valley. Many narrow roads with low traffic volumes are located throughout the unincorporated areas. Due to the efforts of farmers and Napa County residents, much of the land in these rural areas is designated as agricultural preserve, and the Land Trust of Napa County is actively securing easements and using other tools to preserve the natural landscape.

## CHARACTERISTICS OF BIKE TRIPS

Understanding the reasons that people bike in Napa County is fundamental to creating a network that existing users can continue to use and people new to bicycling can begin to experience. Existing bicycle network usage will inform the Plan recommendations.

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<sup>4</sup> Napa County Travel Behavior Study, 2014. Available online at:

<http://www.nvta.ca.gov/sites/default/files/Napa%20County%20Travel%20Behavior%20Study.pdf>

<sup>5</sup> Plan Bay Area is the long-range regional plan for transportation and land use in the Bay Area’s nine counties.

<sup>6</sup> For more information about Priority Development Areas and the locations in Napa County, and throughout the Bay Area, visit: <http://gis.abag.ca.gov/website/PDAShowcase/>

## Trip Purpose

Bicycle trips can be broken down into two main categories: transportation and recreation. The former are trips taken by people bound for a destination, the latter simply for enjoyment or exercise. Currently, better data is available about transportation trips than recreation, and this information is presented below.

### Transportation Trips

Generally, a drive of less than 10 minutes equates to a bike ride of less than 30 minutes and is considered “bikeable.” Per the 2016 U.S. Census American Community Survey 5-year Summary, all cities except for American Canyon have over 20 percent of workers with commutes less than 10 minutes (not including those who work from home). Viewed through that lens, the county’s commute trends show an impressive potential for bike commuting. Some residents within the cities and Napa County (approximately 0.8 percent) choose to bicycle to work, and data is readily available regarding residents’ commuting mode choice from the U.S. Census’ American Community Survey (ACS). However, work-related trips only comprise 10 to 15 percent of all household trips; the remaining 85 to 90 percent of trips are made to visit friends and family or for errands, entertainment, outings, and recreation.<sup>7</sup> While data is not readily available, it is safe to assume that Napa County residents are more likely to bike for non-work trips because non-work destinations, such as a retail shop or a friend’s house, are likely to be located closer to home.

Only the cities of Calistoga and Napa have bicycle commute percentages over one percent, and the overwhelming majority of residents drive to work (see Table 3.1). However, current commuting patterns do indicate opportunities for mode shift.

Table 3.1. Commute Characteristics in Napa County<sup>8</sup>

	Automobile /Motorcycle	Public Transportation	Bicycle	Walk	Work from Home	Commute <10 minutes
<b>American Canyon</b>	93.9%	1.5%	0.4%	0.7%	3.3%	9%
<b>Calistoga</b>	76.7%	0.0%	1.6%	14.6%	5.2%	31%
<b>City of Napa</b>	90.8%	1.8%	1.1%	2.1%	3.5%	20%
<b>St. Helena</b>	82.2%	1.3%	0.3%	7.2%	8.0%	34%
<b>Yountville</b>	88.3%	0.9%	0.7%	3.3%	6.8%	22%
<b>Napa County Total</b>	87.7%	1.4%	0.8%	4.1%	5.1%	21%

<sup>7</sup> Range references the National Household Travel Survey (15 percent) and California Household Travel Survey (9.9 percent).

<sup>8</sup> 2016 U.S. Census American Community Survey 5-year summary.

Some bicycle trips in the county are also related to school travel. In 2012, a parent survey was conducted as a part of the Napa County Safe Routes to School program. Of the respondents, four percent of students bike to and from school. However, the majority of school trips were made via the family vehicle (68 percent). Data on modal splits related to school travel has not been collected since this 2012 survey but will be a part of the new Safe Routes to School program led by the Napa County Office of Education and the Napa County Bicycle Coalition.

### **Tourism and Recreation Trips**

While bicycling for transportation is an important element to plan for in Napa County, recreational bicycling likely accounts for a larger portion of trips. Recreational trips are not captured in available data about mode split. However, people on bikes can readily be seen throughout Napa County, especially on weekends. These recreational riders include:

- Confident recreational road bicyclists who typically take longer rides along rural roads and are comfortable riding near higher-speed and/or higher-volume traffic,
- Mountain bikers/gravel riders who ride on the unpaved trails in the county, and
- Neighborhood and shared-use path riders, including individuals, groups, or families who ride for enjoyment and exercise but are not comfortable riding near higher-speed, higher-volume traffic.

Today, many of these recreational riders drive to the start of their rides. Some riders may be traveling from nearby counties, or if they are Napa County residents, their ride's starting location may be further than a bikeable distance from home. Others may not be comfortable bicycling on the roads between home and the trailhead.

Tourism is a major industry for the county and must be accounted for in bicycle planning and implementation efforts. Napa County receives 3.5 million visitors annually; 80 percent of visitors are from the United States, and 20 percent are international. Just over a third of the visitors stayed overnight within Napa County on their trip; the rest visited Napa County as a day trip.

In 2016, Visit Napa Valley, the official tourism marketing organization, conducted a visitor survey to better understand the types of visitors that come to the area, where they visit within the county, and what they do during their visit.<sup>9</sup> Four percent of the respondents reported that they were planning to bike, or had already biked, on their trip. This equates to nearly 150,000 visitors annually biking within the county who may be unfamiliar with the area and its bike network, or with biking in general.

### ***How Many People Bike Today?***

Some work has been done in the past few years by multiple parties to understand how many people are bicycling in Napa County, but there is currently no comprehensive program for counting bicyclists in the county. The Vine Trail Coalition maintains continuous counters at three locations along the trail to

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<sup>9</sup> Visit Napa Valley (2017). 2016 Napa Valley Visitor Industry Economic Impact. Viewed at <https://www.visitnapavalley.com/articles/post/visit-napa-valley-releases-the-2016-napa-valley-visitor-industry-economic-impact-visitor-profile/> on April 2, 2018.

monitor trail usage. Between January 2018 and December 2018, counters recorded the following approximate average daily counts<sup>10</sup>:

- 240 bicyclists daily north of Imola Avenue in Napa (near South Napa Century Center)
- 150 bicyclists daily at Salvador Avenue in Napa
- 180 bicyclists daily at north end of trail in Yountville

Peak usage days reached high counts of approximately 470, 360, and 600 bicyclists at the above locations, respectively. The Vine Trail counters also indicate that seven in ten users are locals, and weekend days have much higher ridership, accounting for nearly 40 percent of weekly ridership.

Additionally, NVRTA has periodically conducted manual counts at select locations throughout the county. The most recent bicycle and pedestrian counts are from September 2015 and were taken at 21 locations in the Napa County municipalities and unincorporated areas. Appendix D contains recommendations for an ongoing NVRTA count program.

### *Considerations for the Bicycle Plan*

**Work-related trips:** The Plan must acknowledge that many commute trips for Napa residents are longer than a bikeable distance and so should focus on connections to transit services that serve employment centers.

**Nonwork-related trips:** Many trips are not work-related and are for purposes of running errands, visiting friends or family, entertainment, outings, and recreation. These trips have a large potential for mode shift since they tend to be shorter.

**School-related trips:** Development of a student or parent survey to understand travel choices can be part of a Safe Routes to School program.

**Bicycle tourism:** A complete bicycle network for Napa County will need a strong emphasis on wayfinding, amenities and facilities for a broad spectrum of riding abilities to account for visitors' needs.

**Bicycle ridership data:** Development of an ongoing data collection strategy can help the county's jurisdictions and agencies better understand changing ridership over time, help interpret collision data by estimating exposure, and potentially help quantify mode shift when paired with other data.

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<sup>10</sup> Counts are extrapolated from total average daily users multiplied by 0.6, the approximate percentage of users who are bicyclists (as opposed to pedestrians).

## COLLISION TRENDS

One of the goals of this Plan is to improve safety for bicyclists, including a commitment to eliminating bicycle fatalities by 2035, and decreasing the overall number and severity of collisions. Understanding the current safety conditions and locations of high-injury corridors and intersections can support decisions on the location and type of infrastructure improvements to construct and how to prioritize the allocation of funding resources.

The data used in this analysis includes all reported crashes in Napa County involving at least one bicycle that resulted in an injury between 2006 and 2013.<sup>11</sup> It is important to note that bicycle crashes are known to be under-reported. For example, single-bicycle crashes not involving a motor vehicle are not captured in public crash databases, even though they can be severe. Additionally, instances where both parties do not report the crash are not included. The number of unreported crashes in Napa County is unknown; a study conducted by the Federal Highway Administration found that 33 to 57.5 percent of all bicycle crashes potentially go unreported.<sup>12</sup>

As shown in Table 3.2, between 34 and 60 bicycle crashes occurred in Napa County each year from 2006 through 2013, or around thirty-five crashes annually per 100,000 residents. Of these crashes, six resulted in fatalities. Bicycle crashes accounted for an average of approximately five percent of all Napa County injuries and just under seven percent of its traffic fatalities and overall collisions.

**Table 3.2. Crash totals and severity in Napa County, 2006-2013 (Source: TIMS)**

Year	Number of Crashes	Number of Bicyclist Injuries				Fatal
		Severe	Other Visible	Complaint of Pain	Total <sup>13</sup>	
2006	56	10	31	14	59	1
2007	54	6	31	17	55	0
2008	60	7	33	20	64	0
2009	34	5	14	14	36	1
2010	45	7	23	14	46	1
2011	41	7	25	9	43	0
2012	49	7	24	16	50	2
2013	51	8	29	13	52	1

<sup>11</sup> The data used in this analysis is from the Transportation Injury Mapping System (TIMS) database, produced by SafeTREC at University of California, Berkeley. This database compiles collision data from the California Highway Patrol's Statewide Integrated Traffic Records System for all injury crashes, excluding those reported as property damage only.

<sup>12</sup> Federal Highway Administration. Injury to Pedestrians and Bicyclists: An Analysis based on Hospital Emergency Department Data. FHWARD-99-078. 1999.

<sup>13</sup> Total crashes may not equal the sum of the injury type reported because only one "injury severity" is reported per crash; however, more than one bicyclist may be involved in a crash.

## Location

Most (58 percent) of the bicycle crashes in Napa County occur in the City of Napa. Table 2.3 shows the number of reported bicycle crashes in each individual jurisdiction over the 2006 to 2013 time period. Figures 3.2-6 shows an overview of crash locations which indicates a clear clustering of crashes in those areas with higher ridership: within the cities and along known recreational riding routes in the unincorporated areas of the county. A closer look at each jurisdictions' crash history is presented in the individual jurisdiction plans. Those plans identify high-crash streets where a larger number of crashes have occurred, indicating that people are riding bicycles in these locations, and that safety issues may exist.

**Table 3.3. Number and Location of Reported Bicycle Crashes in Napa County, 2006-2013 (Source: TIMS)**

Location	Number
American Canyon	18
Calistoga	16
Napa	227
St. Helena	20
Yountville	1
Unincorporated Areas	108
<b>Napa County (total)</b>	<b>390</b>

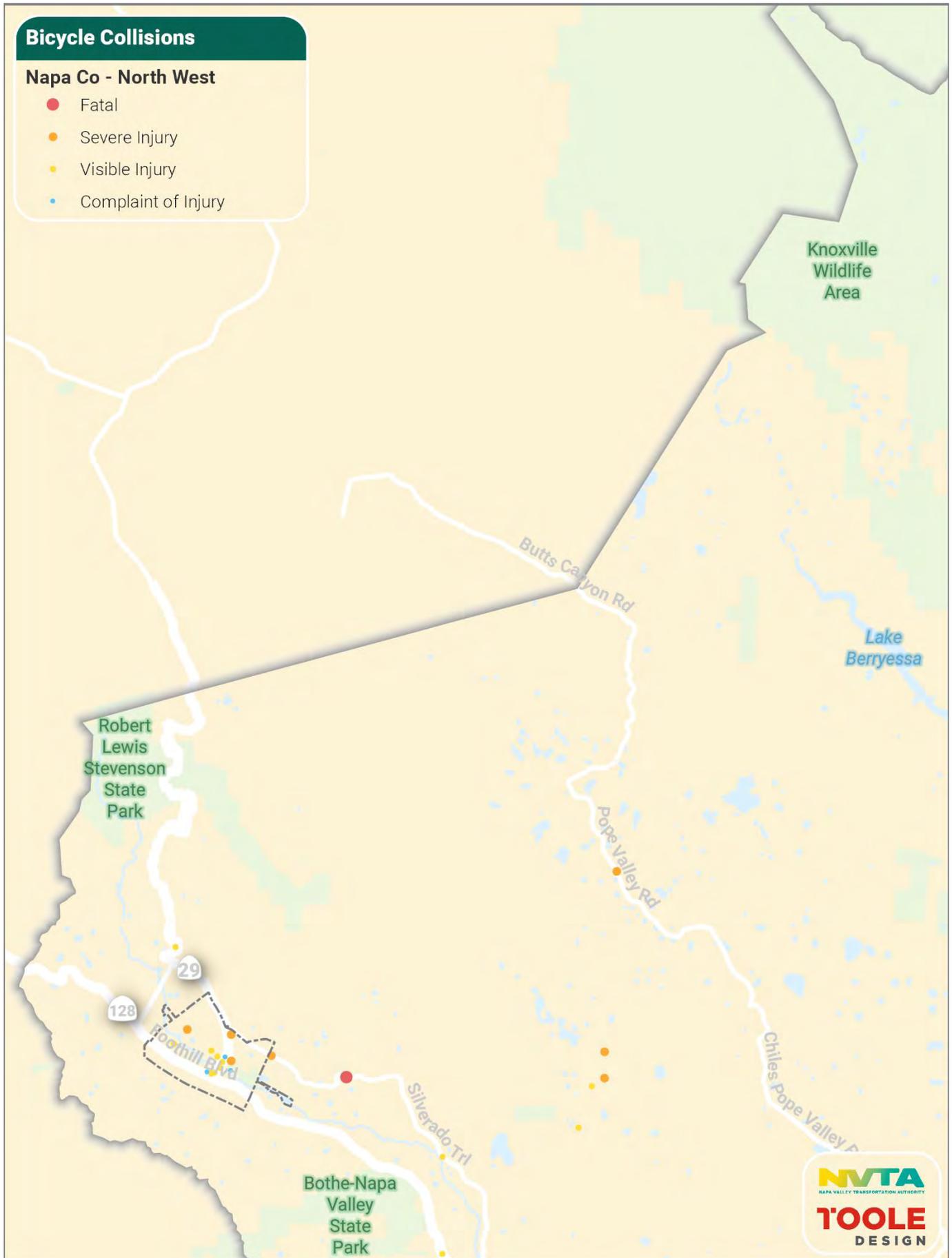


Figure 3.2. Locations of Bicycle Crashes in Napa County, 2006-2013 – Northwest (Source: TIMS)



Figure 3.3. Locations of Bicycle Crashes in Napa County, 2006-2013 – Northeast (Source: TIMS)

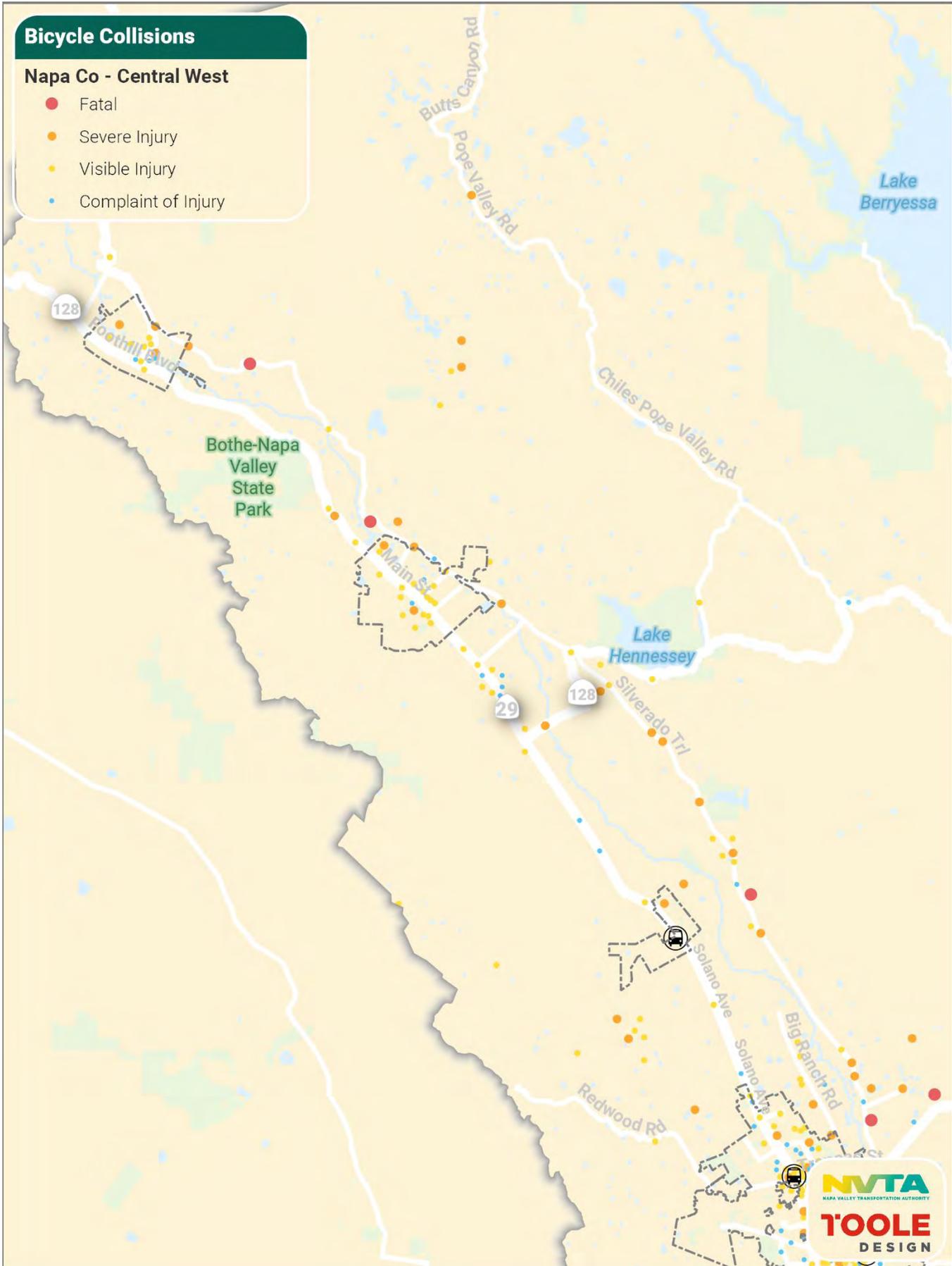


Figure 3.4. Locations of Bicycle Crashes in Napa County, 2006-2013 – Central West (Source: TIMS)



Figure 3.5. Locations of Bicycle Crashes in Napa County, 2006-2013 – Central East (Source: TIMS)

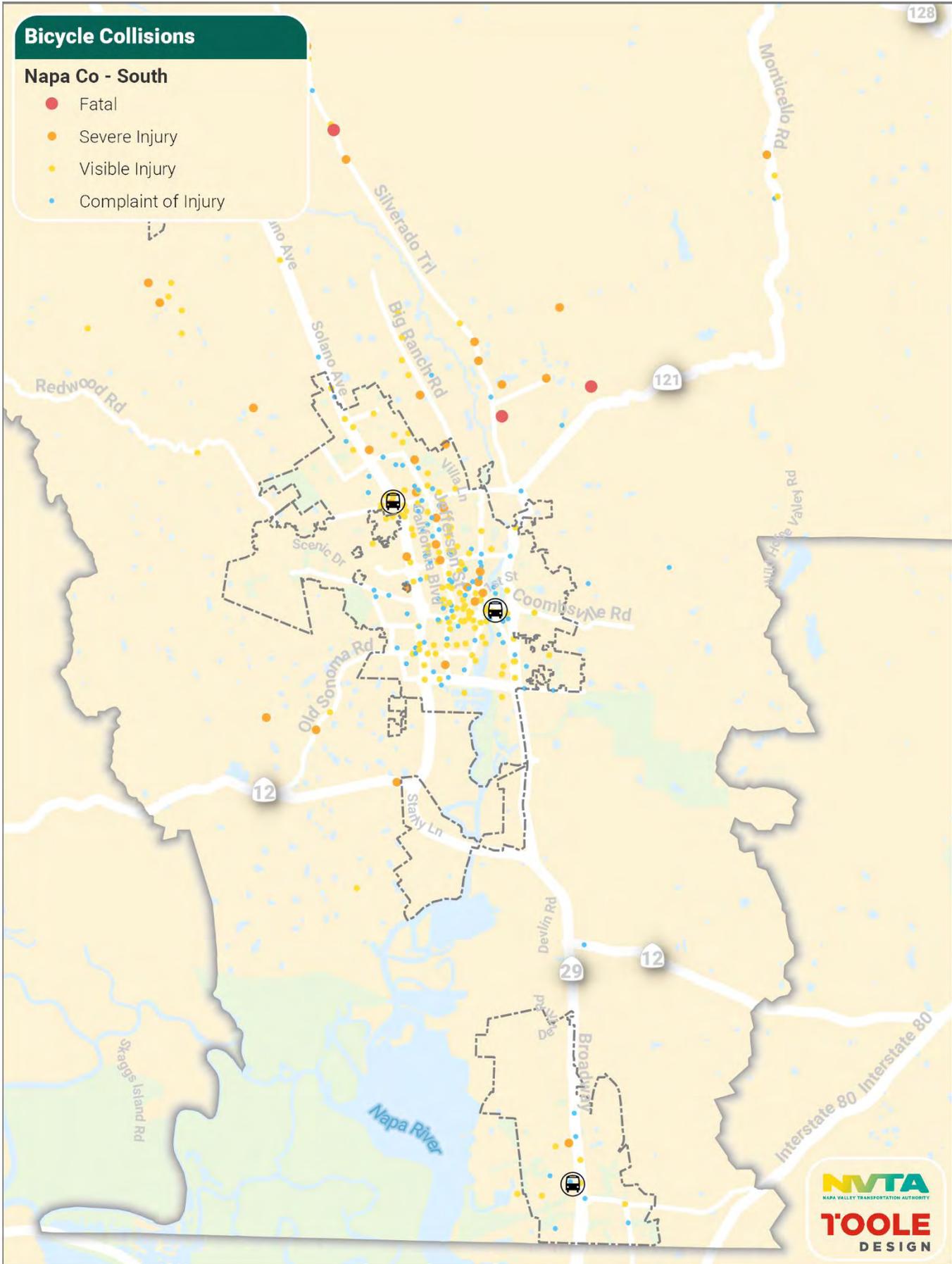


Figure 3.6. Locations of Bicycle Crashes in Napa County, 2006-2013 – South (Source: TIMS)

## DEMOGRAPHICS

In Napa County, children under 18 years of age comprise a significant number (26 percent) of those injured in bicycle crashes, as shown in Figure 3.7. In general, children are especially vulnerable road users due to their size (and therefore, driver difficulty in seeing them) and limited ability to judge speed and risk. A much smaller percentage of injury crashes in the unincorporated areas involved children than in the cities. This finding matches expectations since most of the riding in unincorporated areas is done by adult riders on longer recreational trips, whereas child bicyclists commonly ride in their neighborhoods.

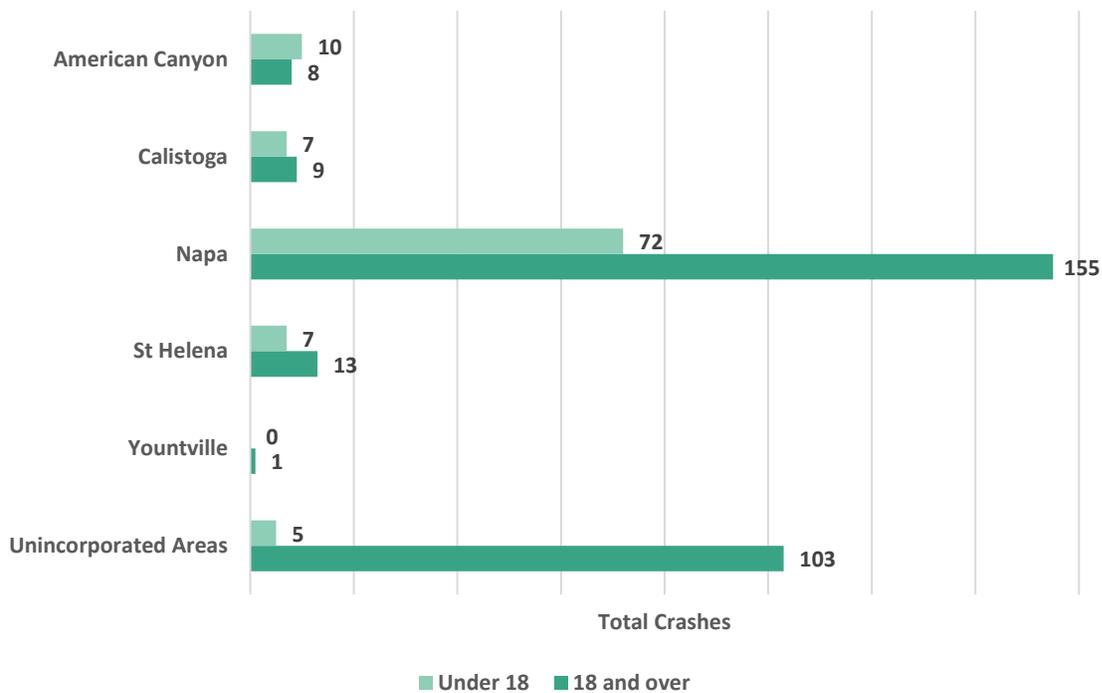


Figure 3.7. Number of Bicycle Crashes by Age in Napa County, 2006-2013 (Source: TIMS)

### Daily and Seasonal Trends

Bicycle collisions in Napa County are most common on Fridays, but otherwise occur with consistent frequency throughout the week. Most crashes (86 percent) occurred during daylight hours. Regarding seasonal trends, crashes are more common in the summer months and less common in the winter, consistent with the prevalence of bicycling throughout the year. May and October have the highest crash frequency.

### Primary Collision Factors

Table 3.4 indicates the most common primary collision factors for bicycle crashes in Napa County. The bicyclist being on the “Wrong Side of Road” resulted in the most injuries. This usually implies that the bicyclist was traveling in the opposite direction of traffic, often on a sidewalk and was struck while in a pedestrian crossing or driveway. While the responsibility for this type of crash is assigned to the

bicyclist, bicyclists in this situation are often trying to get to a location that cannot be accessed with bike facilities. As a result, they use other modal facilities or existing bike facilities in the wrong direction. Some bicyclists may also not be fully informed about their rights and responsibilities as a road user and understand that they are required to ride in the same direction as other vehicle traffic.

“Improper Turning” led to nearly all the reported fatalities. “Automobile Right of Way” (bicyclist not yielding) and unsafe speeds were also common reasons for collisions. Unfortunately, making infrastructure or programmatic recommendations is difficult for the primary collision factors labeled “Unknown,” “Other Hazardous Conditions,” and “Other Than Driver” because descriptions are not provided.

Table 3.4. Primary Collision Factors for Reported Bicycle Crashes in Napa County, 2006-2013 (Source: TIMS)

Primary Collision Factor	Injury	Killed	Total
Bicyclist on Wrong Side of Road	93	0	93
Improper Turning	73	5	78
Automobile Right of Way (bicyclist not yielding)	71	1	72
Unsafe Speed (of vehicles)	45	0	45
Unknown	24	0	24
Traffic Signals and Signs (disregarded)	22	0	22
Other Hazardous Violation	20	0	20
Other Than Driver (or Pedestrian)	16	0	16
Driving or Bicycling Under the Influence of Alcohol or Drug	10	0	10

### Considerations for the Bicycle Plan

**Prioritize investments for high-crash locations:** Streets with a large number of bicycle crashes indicate where people are already riding and investments could improve safety. These streets will be included in the bicycle network for improvements and could be prioritized for implementation.

**Bikeway facility selection and education based on collision factors:** Each of the high-frequency collision factors points to a need for both infrastructure and education. Suitable infrastructure can help make bicyclists’ movements more predictable and keep them separated from automobile traffic. Education can help all parties understand rules and responsibilities, as well as proper use of infrastructure to help avoid collisions.

**Vision Zero:** Numerous communities within the Bay Area have adopted Vision Zero policies and are developing action plans. These policies set communities on a path toward safer roadways for all users and may be a beneficial framework for reducing fatal and severe bicycle crashes.

**Safe routes to school:** The high percentage of children involved in crashes in the incorporated areas indicates a need for both infrastructure and education. Education recommendations can be aimed at child bicyclists, parents, and drivers.

*Vision Zero is a strategy to eliminate all traffic fatalities and serious injuries, while increasing safe, healthy equitable mobility for all. Though people walking and biking are generally most severely impacted by traffic crashes, Vision Zero applies to all modes.*

## BICYCLE FACILITIES AND NETWORK

Investments in Napa County’s bicycle network over several decades has resulted in a continually expanding system. Napa County’s bicycle network includes shared routes, bike lanes and shared-use paths. Table 3.5 details the total mileage of each facility type within the cities, town, and unincorporated areas of Napa County.

**Table 3.5. Bicycle Network Mileage**

Jurisdiction	Facility Type	Existing Mileage	Total Mileage
<b>City of American Canyon</b>	Vine Trail (Class I)	2.4	13.1
	Shared-Use Paths (Class I)	7.3	
	Bike Lanes (Class II)	1.6	
	Bike Routes (Class III)	1.8	
<b>City of Calistoga</b>	Vine Trail (Class I)	1.0	6.0
	Shared-Use Paths (Class I)	0.4	
	Bike Lanes (Class II)	1.0	
	Bike Routes (Class III)	3.6	
<b>City of Napa</b>	Vine Trail (Class I)	7.0	49.0
	Shared-Use Paths (Class I)	7.9	
	Bike Lanes (Class II)	28.5	
	Bike Routes (Class III)	5.6	
<b>City of St. Helena</b>	Vine Trail (Class I)	-	2.5
	Shared-Use Paths (Class I)	1.0	
	Bike Lanes (Class II)	1.3	
	Bike Routes (Class III)	0.2	
<b>Town of Yountville</b>	Vine Trail (Class I)	1.3	4.1
	Shared-Use Paths (Class I)	1.2	
	Bike Lanes (Class II)	1.2	
	Bike Routes (Class III)	0.5	

Jurisdiction	Facility Type	Existing Mileage	Total Mileage
<b>Unincorporated Napa County</b>	Vine Trail (Class I)	3.8	67.5
	Shared-Use Paths (Class I)	7.7	
	Bike Lanes (Class II)	54.3	
	Bike Routes (Class III)	1.7	
<b>Countywide</b>		<b>TOTAL</b>	<b>142.2</b>

Napa County also contains 18 miles of the existing Bay Trail. The San Francisco Bay Trail is a planned 500-mile walking and cycling path around the entire San Francisco Bay running through all nine Bay Area Counties and 47 cities. The mission of the Bay Trail Project is a fully separated, paved pathway as close to the shoreline as possible. The trail currently varies between natural and paved surfaces. The Bay Trail Project has funded ten trail or bike lane projects in Napa County, and anticipates a new program and call projects in the near future. Table 3.6 contains existing and planned Bay Trail mileage in Napa County.

**Table 3.6. Bay Trail Mileage in Napa County**

Facility Type	Existing Mileage
<b>Paved Trails*</b>	10.5
<b>Natural surface</b>	7.5
<b>TOTAL</b>	<b>18</b>

\*The mileage for paved trails is also included in Table 3.5 under the “Shared-Use Paths (Class I)” category.

A map of the existing network in Napa County shown in Figures 3.8-12. Subsequently, the most common types of bicycle facilities are reviewed, focusing on their potential application within Napa County. Many facility types already exist within the county, but some have not yet been implemented and will be part of this Plan’s recommendations.

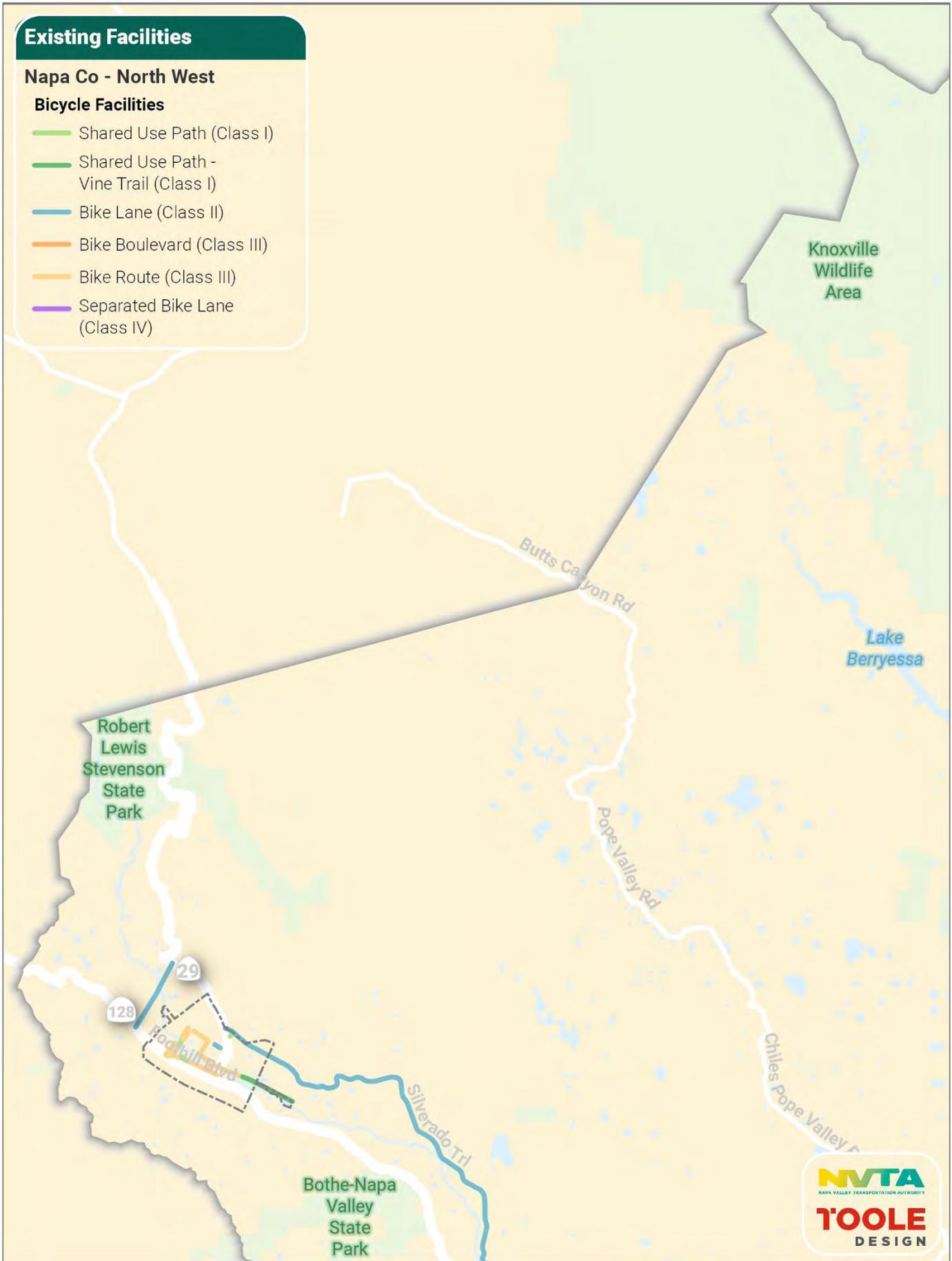


Figure 3.8. Existing Bicycle Facilities in Napa County – Northwest

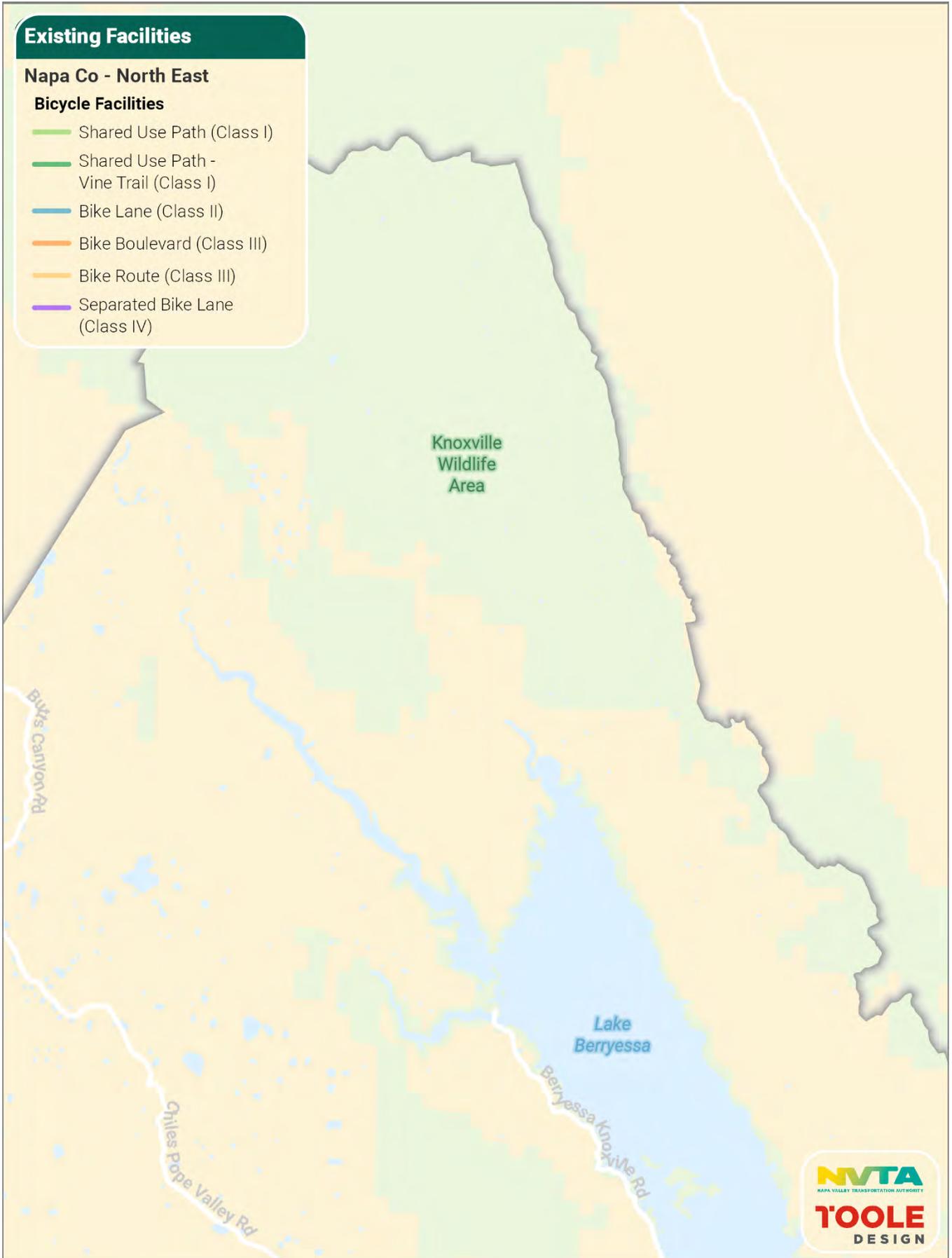


Figure 3.9. Existing Bicycle Facilities in Napa County – Northeast

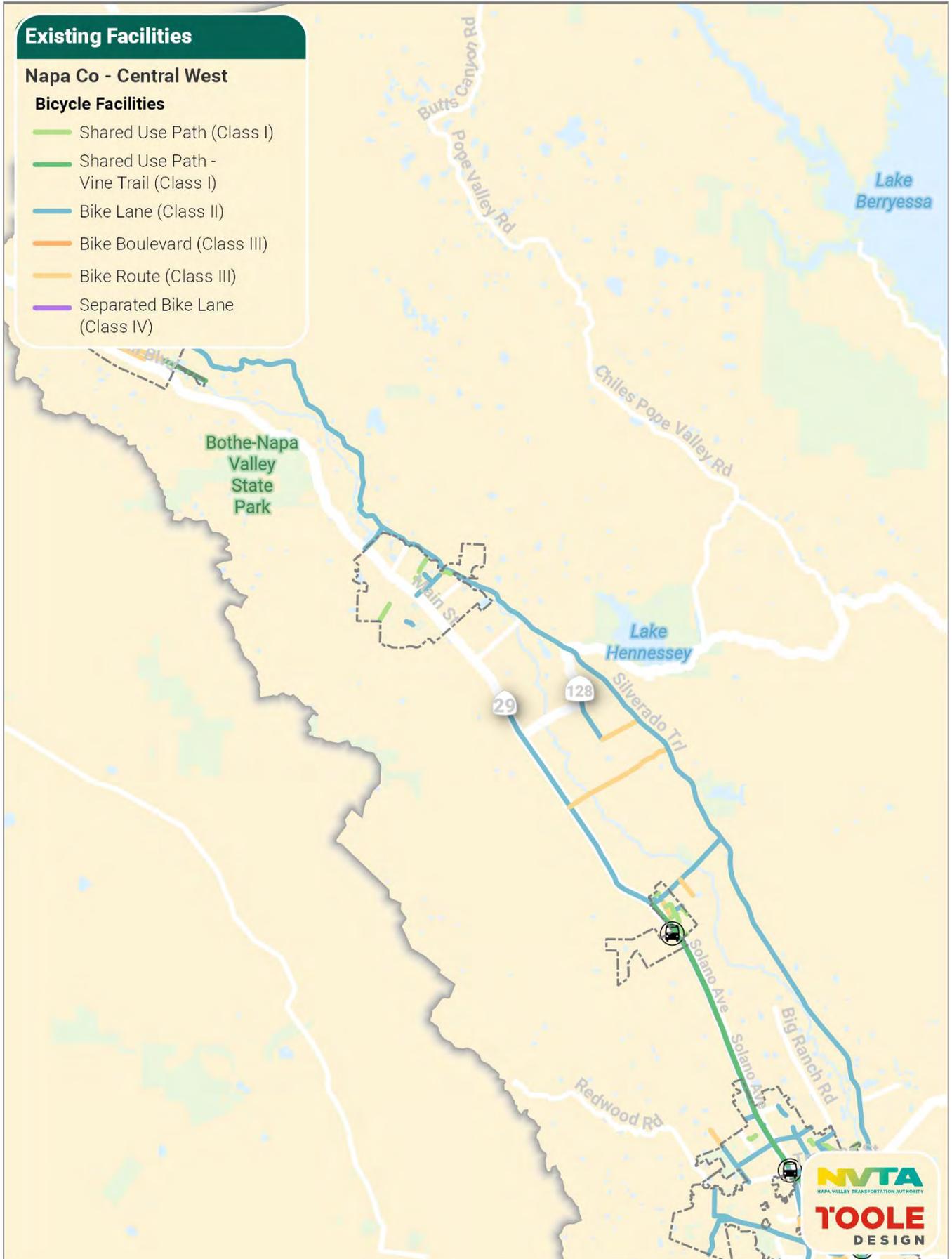


Figure 3.10. Existing Bicycle Facilities in Napa County – Central West

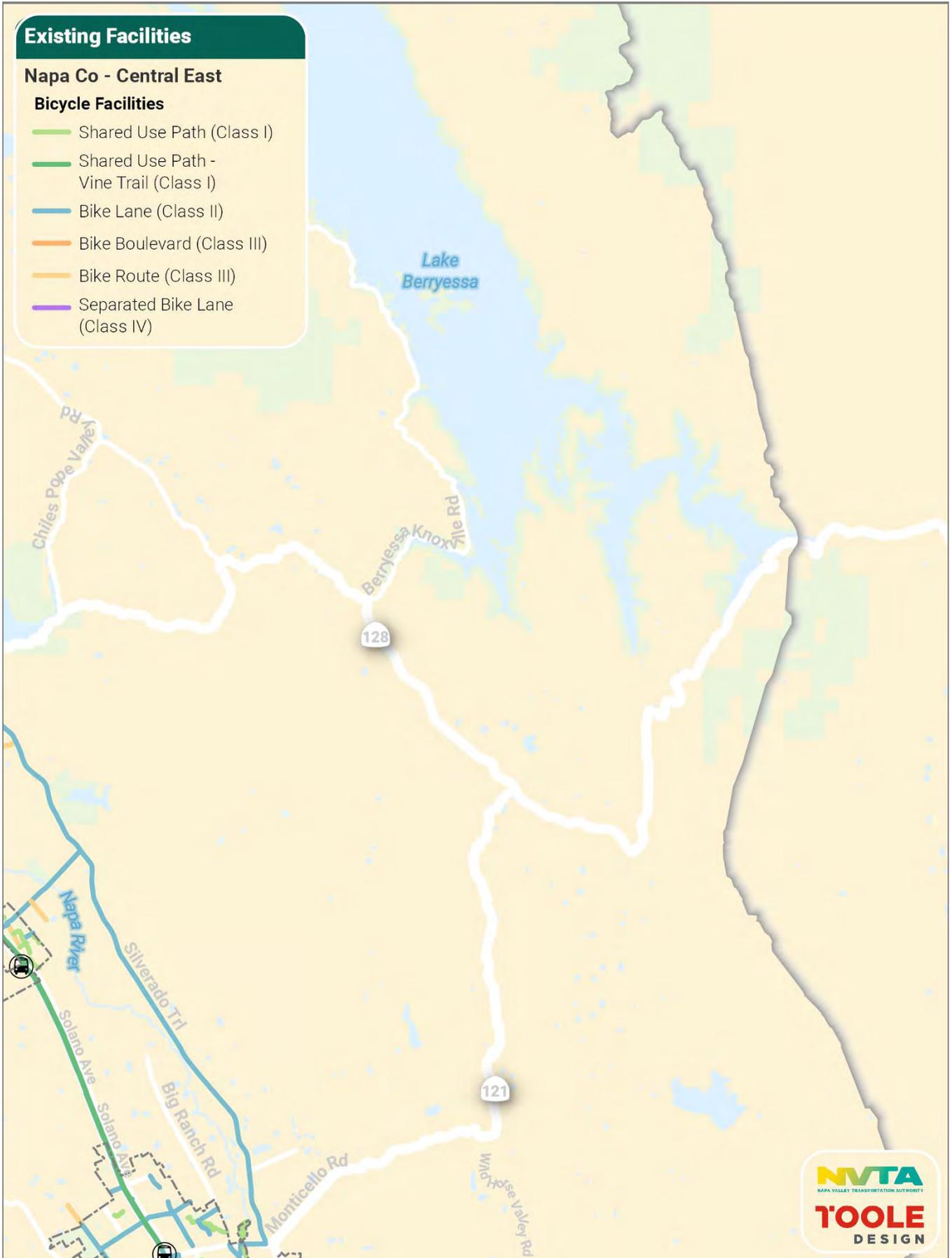


Figure 3.11. Existing Bicycle Facilities in Napa County – Central East

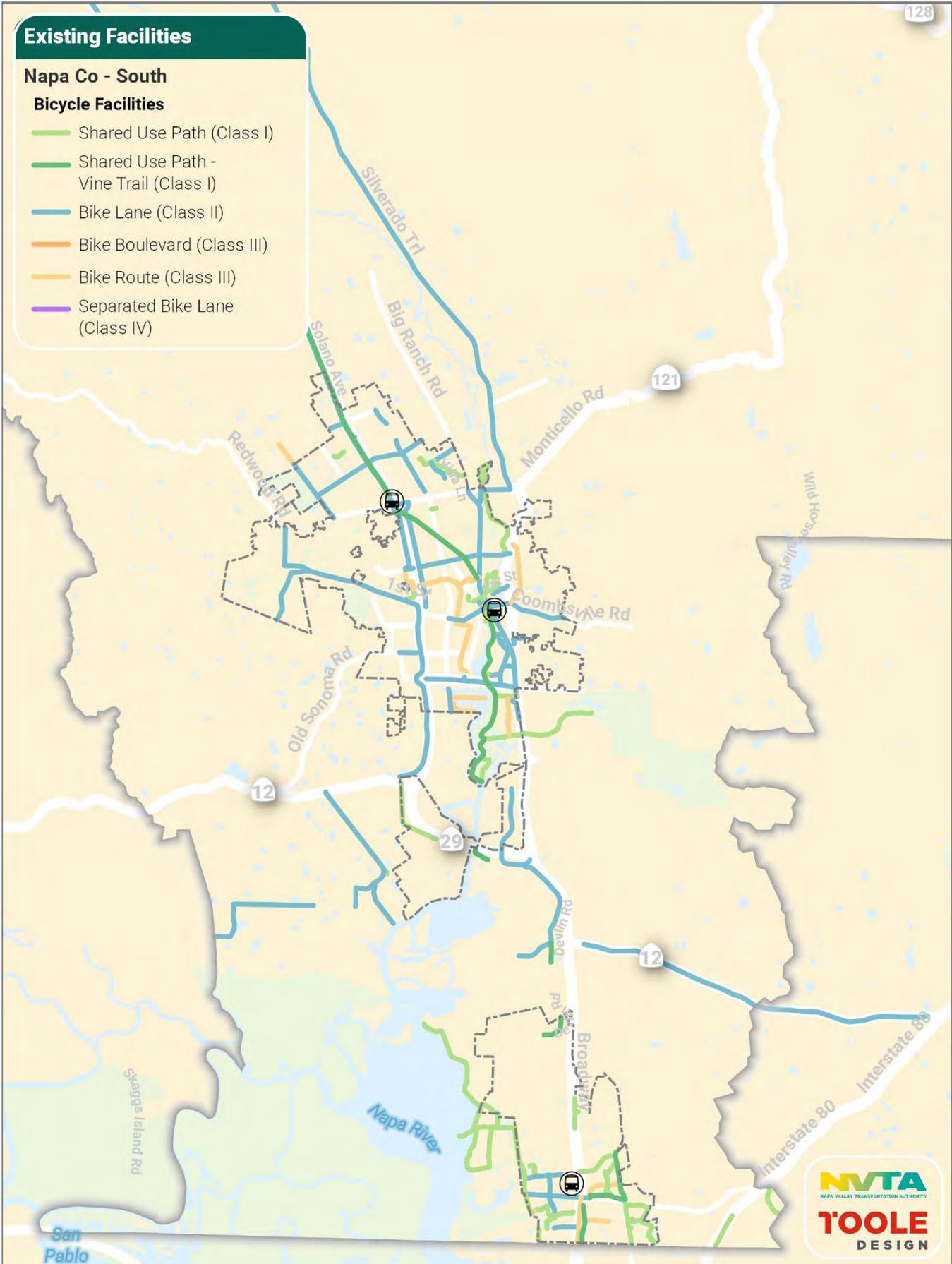


Figure 3.12. Existing Bicycle Facilities in Napa County – South

## Facility Types

This section includes an overview of bicycle facility types and their application in Napa County.

**Shared-Use Path (Class I)** are two-way paved facilities, physically separated from motor vehicle traffic and used by bicyclists, pedestrians, and other non-motorized users. Shared-use paths are often located in an independent alignment, such as a greenway, though sometimes they are located adjacent to roadway. Shared-use paths provide low-stress facilities for bicyclists.

Some trails in Napa County, although technically not standard shared-use paths provide connections within neighborhoods or as cut-throughs to destinations (see Figure 3.13) and are identified in this plan. Although some of these shared-use paths are substandard in width compared to best practices for Class I design, they are separated from automobile traffic and provide important desired connections within the bicycle network.<sup>14</sup>



Figure 3.13. Neighborhood connection in Calistoga

The Vine Trail is a key shared-use path that is becoming the backbone of Napa County's low-stress bicycle network. The largest completed segment currently connects the Town of Yountville to Kennedy Park at the south end of Napa. Additional small segments have been built elsewhere, and the completed Vine Trail will connect all Napa County jurisdictions as part of a 47-mile active transportation corridor between the Vallejo Ferry Terminal and Calistoga. The Napa Valley Vine Trail Coalition and NVTCA are actively working on planning, design, and construction of trail segments throughout the county.

Many of Napa County's existing shared-use paths connect to the existing and future Vine Trail and natural areas. In addition to providing connectivity to the Vine Trail, these paths connect comfortable neighborhood streets together.

### Examples of Shared-Use Path (Class I) in Napa County:

- Vine Trail (approximately 12 miles over all segments)
- Wetlands Edge Road Trail (1.37 miles), part of the Bay Trail (18 miles in Napa County)
- Connector path between Fairway Vista Ct. and Denise Dr. in Calistoga (0.10 miles)

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<sup>14</sup> Eight feet is the typical recommended minimum for any shared-use path. Some small connector paths in the county are as narrow as four feet.

**Bike Lanes (Class II)** provide an exclusive space for bicyclists in the roadway and are established by painting lines and symbols on the roadway surface. Bike lanes are for one-way travel and are typically provided in both directions on two-way streets and/or on one side of a one-way street (see Figure 3.14).

Bike lanes are the most common facility type in Napa County. Most bike lanes are located on major connector routes, such as Silverado Trail, or on major arterials within Napa County jurisdictions, such as Soscol Avenue in Napa and American Canyon Road in American Canyon.



Figure 3.14. Bike Lane - Class II in St. Helena

Bike lanes create a lower-stress riding environment on streets with a maximum posted speed limit of 30 miles per hour and traffic volumes between 3,000 and 6,000 vehicles per day. Many of the bicycle lanes in Napa County are on roadways with higher speeds which can result in a stressful bicycling environment for many bicyclists, including Interested but Concerned bicyclists. Some of these facilities are well used, however, by the many Napa County residents and visitors who are more comfortable with bicycling in high-speed environments.

Bike lanes may also be painted for greater visibility to drivers and bicyclists. One of two painted bike lanes in Napa County is located on Valley View Street in St. Helena (see Figure 3.15). Another painted bike lane is located on SR 29 at Whitehall Lane; the bicycle lane crosses skewed railroad tracks at this location, and the painted bike lane provides an easily understandable route for bicyclists to cross the tracks at a safer angle (see Figure 3.16). This facility was implemented by Caltrans.



Figure 3.15. Painted bike lane on Valley View St in St. Helena

### Examples of Bike Lane - Class IIs in Napa County:

- Grant Street in Calistoga (0.3 miles)
- Silverado Trail from Calistoga to Napa (approximately 26 miles)
- Pope Street in St. Helena (0.85 miles)

**Buffered Bike Lanes (Class II)** are implemented by painting or otherwise creating a flush buffer zone between a bicycle lane and the adjacent travel lane (see Figure 3.17). While buffers are typically used between bike lanes and motor vehicle travel lanes to increase bicyclists' comfort, they can also be installed between bicycle lanes and parking lanes to reduce conflicts with opening car doors. When located on streets with moderate traffic volumes and speeds, buffered bike lanes provide a lower-stress riding environment for bicyclists. No buffered bike lanes exist today in Napa County.

**Bike Routes and Bicycle Boulevards** are two types of **Class III** facilities in Napa County. This Plan Update will include Class III Rural Routes and Class III Bicycle Boulevards as facility types, but this section describes the existing conditions in the county where bike routes are applied more broadly than in rural areas.

Bike routes are designated with pavement markings or signage to indicate a shared lane environment between bicyclists and drivers. While signage and markings support wayfinding and indicate bicyclist positioning on shared streets, bicycle routes do not provide any protection or separation between people driving and people bicycling. When located on streets that have high traffic speeds and/or volumes, bike routes are uncomfortable and most people will choose not to ride on them.

Currently, bike routes are located on a range of roadway types from local, urban streets (see Figure 3.18) to low-volume rural roads (see Figure 3.19). These routes connect to destinations such



Figure 3.16. Painted bike lane on SR 29



Figure 3.17. Buffered bike lane in Seattle, WA



Figure 3.18. Bike route in St. Helena

as shopping, schools, parks, or other bicycle facilities. Most bicycle routes in Napa County are in the City of Napa, where they comprise much of its downtown network. The City of Calistoga also has a network of bicycle routes that connect to existing trails and bicycle lanes throughout the city.

Bicycle boulevards are also indicated with pavement markings and signage, but are specifically located on low-speed, low-volume streets, often in residential neighborhoods. Bicycle boulevards are designed to prioritize bicycle through-travel, while reducing motor vehicle through traffic volumes and maintaining relatively low speeds. When paired with intersection treatments that help riders cross major intersections, bicycle boulevards are an attractive, low-stress facility (see Figure 3.20).

Bicycle boulevards are located on a limited number of streets in Napa County and do not include traffic calming or traffic diversion to lower speeds and volumes. These bicycle boulevards also do not cross major roadways and do not have treatments to facilitate bicyclists' movement through large, unsignalized intersections.

#### Examples of Class III Bicycle facilities in Napa County:

- North Oak Street in Calistoga (Bike route, 0.31 miles)
- Oakville Cross Road in the unincorporated area of Napa County (Bike route, 1.5 miles)
- Franklin Street in Napa (Bicycle boulevard, 0.77 miles)



Figure 3.19. Bike route along rural Silverado Trail



Figure 3.20. Crossing island help reduce stress for bicyclists when crossing intersections. Example in Portland, OR.

**Separated Bike Lanes (Class IV)** are an exclusive bikeway facility type that combines the user experience of a shared-use path with the on-street elements of a conventional bike lane (see Figure 3.21). They are recommended for roadways with speeds higher than 30 miles per hour and motor vehicle volumes over approximately 6,500 vehicles per day. Separated bike lanes are physically separated from motor vehicle traffic with a vertical element and are distinct from the sidewalk. They can be located at street level within the curbs, at an intermediate level, or at sidewalk level, see Figure 3.22 below. Numerous options are available for creating separation between modes, ranging from low-cost paint and plastic flexpost installations, to more robust curb-separated lanes. Separated bike lanes provide a low-stress riding environment to all bicyclists. No separated bike lanes currently exist in Napa County.



Figure 3.21. Separated bike lane in Berkeley, CA

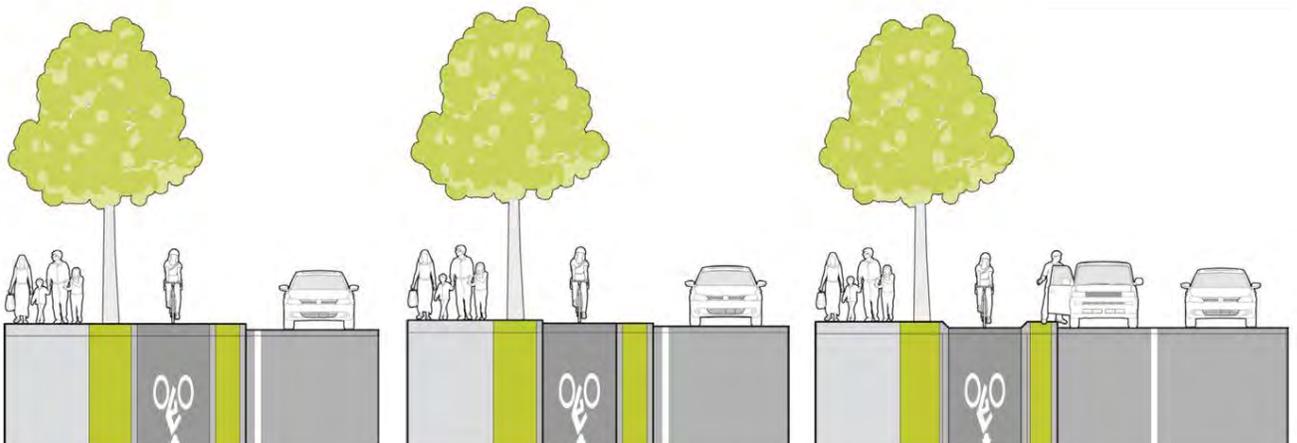


Figure 3.22 Sidewalk level, intermediate level, and street level separated bike lanes, left to right.

## Network Connectivity

The purpose of a bicycle network is to safely connect people to places. This is done through having facilities that feel comfortable to ride, that also connect to one another, and to important destinations. To work toward meeting this Plan's goal of shifting trips to bicycling, a safe, connected network must be in place that serves a wide range of riders.

A brief overview of each community's connectivity is provided below, and greater detail is available in the jurisdictional plans (see Chapter 6-11).

- **Calistoga's** bike network mostly consists of bike routes, which offer shared street experiences for drivers and bicyclists. These routes are along local and collector streets in the city and provide connections to trails and recreational routes. Bike lanes exist along the city's portion of the Silverado Trail and a small section of Grant Street. Some community-created wayfinding exists to help route bicyclists to facilities, but it does not feature destination or distance information (see Figure 3.23). The low-speed, low-volume nature of most of Calistoga's streets means that connectivity to destinations is generally good.
- **St. Helena** has limited bike facilities. In addition to some short trail and bike route connections, the city has bike lanes along Silverado Trail, Pope Street, and a short segment of Valley View Street. Green painted bike lanes were installed on Valley View Street near St. Helena Primary School. These green bike lanes were implemented because of the poor sight line where the road curves on Valley View Street. Overall, many local streets in the city are already comfortable for riding, but they are not signed or marked as bicycle facilities and may not be considered to be part of the network. Additionally, connections to local schools and St. Helena's Main Street destinations could be improved.
- Most of **Yountville's** bike facilities are shared-use paths. The Vine Trail is located along the western edge of the town and has one connection to downtown and residential neighborhoods, in addition to the north and south end points in town. Other trails connect streets in residential areas but are fairly narrow. Bike lanes are marked on Finnell Road and Yountville Cross Road to provide access to the regional Silverado Trail bike facilities. Yountville's commercial areas and the local school could be better served by the bikeway network.



Figure 3.23. Bicycle route wayfinding in Calistoga

- **Napa** has the most developed bicycle network in the county and includes bicycle lanes along major roads such as Browns Valley Road, Soscol Avenue, and Lincoln Avenue. In the downtown area, a small network of bike routes/boulevards serves local destinations. Three main segments of the Vine Trail are within city limits. The cross-town commuter path, a portion of the Vine Trail from Redwood Road to near Soscol Avenue, provides cross-town access in the northern part of the City. A separate segment along the east bank of the Napa River at the southern end of the city connects downtown and neighborhoods to the commercial development in South Napa and on to Kennedy Park and Napa Valley College. Additionally, the Vine Trail connects north from Napa at the Redwood Park and Ride to Yountville. Many existing bike lanes are located on roads that connect to destinations, such as shopping centers at major intersections; however, a number of these streets present stressful riding environments with high-volume, higher-speed traffic.
- **American Canyon's** bicycle network consists mostly of shared-use paths bordering and within green spaces and parks, such as the Wetlands Edge Road Trail, part of the Bay Trail. These trails also connect schools and neighborhoods. There are bike lanes on West American Canyon Road, Benton Way, and Elliot Drive to connect the central area of the city to paths along the perimeter. While Benton Way and Elliot Drive are comfortable bicycle facilities for a range of riders, the bike lanes on American Canyon Road, especially near/crossing SR 29, are a high-stress facility due to high traffic volumes and speeds.
- **Unincorporated Napa County** has concentrated bicycle infrastructure that connects the towns from north to south. The Bay Trail also has significant existing and planned mileage within unincorporated areas of Napa County. A few bike routes exist north of Yountville to help connect users to Silverado Trail. Silverado Trail has a bike lane for the majority of its length with a narrow shoulder in some constrained locations. Some sections feature raised dots along the edge line to alert drivers while allowing bicyclists to ride in the full width of the bike lane without impedence from a rumble strip. Most other bike routes in the unincorporated areas have signage, but no roadway markings.

### *Considerations for the Bicycle Plan*

**Facility choice:** The Plan should provide guidance on appropriate facility choice for roadways that will create a low-stress riding environment that attracts riders of all abilities and comfort levels.

**Connectivity:** The recommended network must consider locations important to community members, such as schools, shopping centers, libraries and parks and transit hubs.

## BICYCLE PROGRAMS

Napa County has several bike programs. These programs have diverse audiences, ranging from bike safety education for students to bike rental opportunities for tourists.

### *Safe Routes to School*

Napa County established its Safe Routes to School program in 2010. Like its national counterpart, Napa County's program is designed to create safe, convenient, and fun opportunities for children to walk and bike to and from school. The goal of the program is to increase students' walking and bicycling rates to school in order to combat childhood obesity, improve air quality and reduce vehicle congestion around schools, and provide students with a mode of transportation that fosters self-reliance and independence.



Figure 3.24. Napa County Safe Routes to School Training

The Safe Routes to School program is promoted through educational events, student prizes, and safety projects with school staff and volunteers, police departments, public health staff, and City traffic managers (see Figure 3.24). In previous years, the program was managed jointly between NVTA and the Napa County Office of Education (NCOE). For the 2018-2020 school years, the program is operated jointly by the Napa County Bicycle Coalition (NCBC) and NCOE with funding and management support of NVTA. As part of the current program, NCBC is conducting infrastructure reviews for walking and bicycling at all Napa County schools, with in-depth reviews at 13 high-need schools that will make recommendations for improving the safety of children walking and biking to school.

### Safety Education

The Napa County Bicycle Coalition, a bicycling advocacy organization in Napa County, works to identify issues affecting bicyclists and find solutions by promoting bicycle infrastructure and safety throughout the county. The Coalition also organizes bike-related events, such as BikeFest, an annual community event in celebration of all things bike-related, which includes bike safety demonstrations, skills workshops/bike rodeo and an on-street ride for kids known as KIDical Mass (see Figure 3.25).

### Bike Rental

Napa County is home to many hotels and bed and breakfasts catering to tourists. Many of these lodgings supply their guests with hourly or daily bike rentals.

In addition, the county has numerous bike shops and bike tour companies that rent out bikes to those looking to explore the area on two wheels. Napa Valley Bike Tours has installed nine bike rental “pods” throughout the county; all are located on private property and are available to the public. Several are located on resort and hotel properties in Napa County that cater to tourists looking for additional flexibility in where and when to rent a bike (see Figure 3.26).

### Considerations for the Bicycle Plan

**Program responsibilities:** The Plan must address the various roles of NVTA, jurisdictions, and community partners in execution of bicycle programs.

**Program content:** Safety education is an important base for bicycle-related education, but the plan must build on existing themes to include messaging to all road users and education about infrastructure.



Figure 3.25. KIDical Mass Bike Tour and Safety Education during BikeFest



Figure 3.26. Napa Valley Bike Tours Self-Serve Spinway Bike Rental Station in Napa

## KEY OPPORTUNITIES

Napa County is well on its way in working toward the goals of this Plan: connectivity, equity, safety, and education and encouragement. Work done by agencies, community governments, residents, advocates, and business leaders sets the stage for the recommendations that follow in this Plan. Those recommendations will focus on the following key opportunity areas:

**Connect the existing network:** The Vine Trail, Bay Trail, and other shared-use paths, bike lanes on streets with moderate speeds and volumes, and bike routes on local streets are the foundation for a countywide low-stress network. Bicycle network recommendations will connect these existing facilities.

**Upgrade high-stress facilities:** Communities have implemented bicycle facilities where people want to ride already, but some are high-stress. Bike network recommendations will highlight where high-stress bike facilities can be upgraded to provide low-stress bicycling that will attract more people to ride.

**Focus on safety:** Network prioritization will include consideration of bicycle crash history, and facility recommendations, both along roads and at intersections, will address crash causes.

## Chapter 4: Proposed Bicycle Network and Programs

This Plan's proposed bicycle network represents the desirable and appropriate facility for each of the streets within the study network. Construction of the entire proposed network will take place over time, often occurring as part of other resurfacing, reconstruction or development projects, though some recommendations will require standalone capital projects. Considerations of ease of implementation, anticipated prioritization, or timeline are addressed in Chapter 5: Implementation Strategy.

The proposed Bicycle Network was developed based on a data-driven analysis, best practices in planning for a safe, connected bicycle network, and jurisdictional staff and community input. This chapter provides an overview of how the proposed network was developed. The proposed network for each jurisdiction is discussed in the individual jurisdiction plans (see Chapters 6-11).

### HOW THE NETWORK WAS DEVELOPED

#### *Street Selection*

The streets in the proposed bicycle network were selected as a part of a data-driven process. Streets considered for bicycle facilities were included based on data from several sources:

- All existing bicycle facilities
- The 2012 Plan network, including Class I paths
- Comments received on the WikiMap
- Review of Strava heat map data for rural recreational routes<sup>15</sup>
- Review of bicycle collision data
- Consideration of access to destinations such as schools, retail, transit hubs and parks

This network was reviewed and edited by NVTA and jurisdiction staff to ensure streets and paths were appropriate and consistent with other plans. This “study network” was reviewed in further detail following the steps below.

#### *Facility Selection*

Each street included in the proposed network was assessed based on best practice understanding of bicycle planning and design. The determination of whether a particular facility type is suitable for a given roadway was based on the following criteria:

1. The network should be usable by bicyclists of all ages and abilities, and the types of infrastructure should be targeted toward the expected user group (e.g., lower-stress facilities within urban/suburban areas where less experienced riders may make short trips vs. higher-stress facilities in rural areas frequented by confident recreational bicyclists).
2. Facility type should match with roadway and traffic characteristics, to allow the safest (real and perceived) facility for the road type, considering limitations such as road width.

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<sup>15</sup> Strava is an app used primarily by recreational bicyclists to track their rides. Approximate volumes of rides on a given road are shown on a heat map available at <https://www.strava.com/heatmap>.

- Consistent facility types should be provided for a given route where feasible, and where roadway types warrant similar facilities.

Facility selection was based on roadway and traffic characteristics, including: posted speed, number of travel lanes, available roadway width, and field observations. Additional input from jurisdiction staff was also considered.

Generally, recommendations adhered to guidance in the draft Bicycle Facilities Toolkit for this Plan, including Figure 4.1.<sup>16</sup> This facility selection guidance is based upon the comfort level of an Interested but Concerned rider, representing the largest segment of the population.

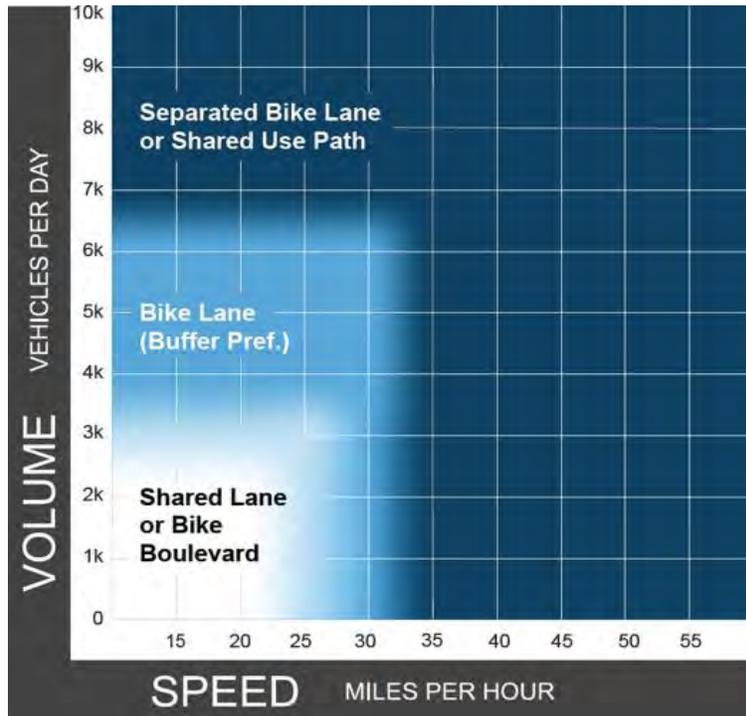


Figure 4.1. Facility selection guidance based on speed and volume

Recommendations that are exceptions to this selection guidance include most of the rural roads in Unincorporated Napa County where it is assumed that people bicycling will be more experienced and have a higher tolerance for proximity to fast-moving traffic. There are a limited number of other project recommendations that may not result in a low-stress riding experience, but nearly all of the recommended facilities would contribute to building a low-stress bicycle network throughout Napa County.

## PROPOSED BICYCLE NETWORK

A bicycle network in Napa County will accommodate the largest number of people if it provides facilities that serve Interested but Concerned riders. Given the right bicycle facilities, education, and encouragement, these residents and visitors may choose to ride a bicycle for transportation and recreation. Facilities that serve this group will also serve more confident bicyclists.

The proposed bicycle network includes over 450 miles of new facilities, as detailed in Table 4.1. Maps of the recommended network are provided in each of the individual jurisdiction plans in Chapter 6-11.

<sup>16</sup> The chart in Figure 4.1 will be included in the AASHTO *Guide for the Development of Bicycle Facilities* which is currently under development.

**Table 4.1. Proposed Bicycle Network**

Facility Type	Proposed Mileage	Existing Mileage	Total Future Mileage
Vine Trail (Shared-Use Path Class I)	27.4	15.5	42.9
Shared-Use Paths (Class I, excluding Vine Trail)	52.0	25.4	77.4
Bike Lanes (Class II)	86.8	87.8	174.7
Bike Boulevards (Class III)	37.4	-	37.4
Bike Routes (Class III)	243.4	13.5	256.9
Separated Bike Lanes (Class IV)	0.9	-	0.9
Corridor Study (not included in total) <sup>17</sup>	13.2	-	13.2
<b>Total Network</b>	<b>459.3</b>	<b>142.2</b>	<b>602.4</b>

The construction of these proposed facilities will create a safe, connected, and comfortable bicycle system to link to community destinations, such as schools, transit, trails, and retail areas. There are an additional 79 miles of proposed shared-use path (Class I) in this plan that will provide short- and long-distance off-street connections in Napa County communities. This Class I mileage includes planned segments of the Bay Trail in the southern portion of Napa County as well as other shared-use path projects throughout the rest of the county.

The proposed bicycle network also provides connections in unincorporated areas and to adjacent jurisdictions through rural bike routes (Class III). Typically, these facilities serve more confident bicyclists since they are on high-speed roads with little to no separation between bicyclists and automobiles. Recommendations about the process for implementing these facilities are included in Chapter 5.

### *Proposed Regional Trails*

In addition to the proposed network of this plan, two major regional trail efforts exist that pass through Napa County: the Bay Trail and the Bay Area Ridge Trail. Each of these long-distance recreational trails has their own planning effort that works in collaboration with jurisdictions throughout the Bay Area. Portions will be implemented as Class I facilities and in some instances overlap with the Vine Trail, and portions may continue to be unpaved trails. Their mileages are not included in the table above unless a designated portion of one of these trails was already included in the 2012 Bicycle Plan as a Class I recommendation.

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<sup>17</sup> Some streets in the City of Napa are recommended for corridor studies to determine the appropriate bicycle facility type and means of implementation because their current configuration and operations are too complex for a determination to be made within the course of this Plan Update.



Figure 4.2. Proposed Regional Trails in Napa County – Northwest



Figure 4.3. Proposed Regional Trails in Napa County – Northeast

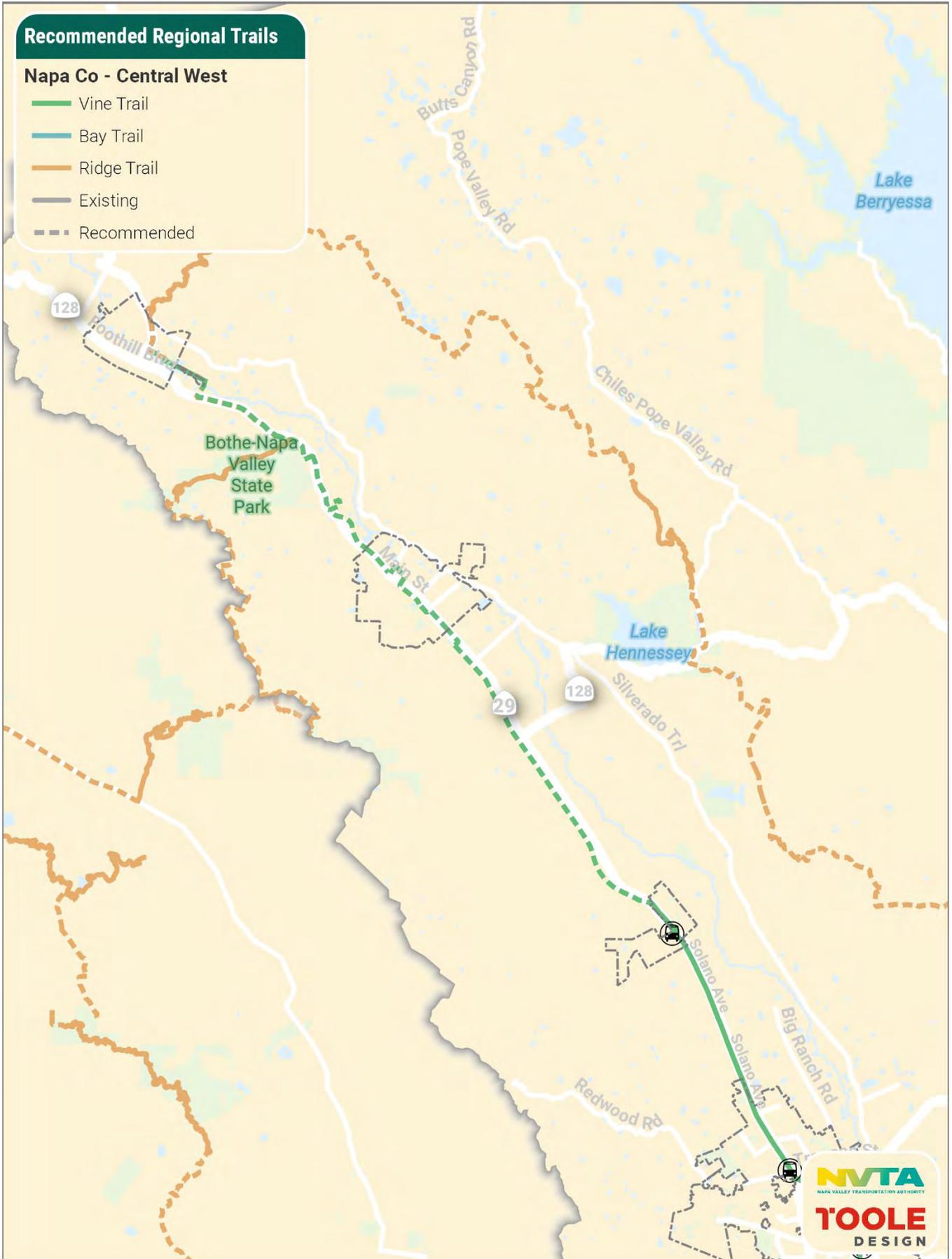


Figure 4.4. Proposed Regional Trails in Napa County – Central West



Figure 4.5. Proposed Regional Trails in Napa County – Central East

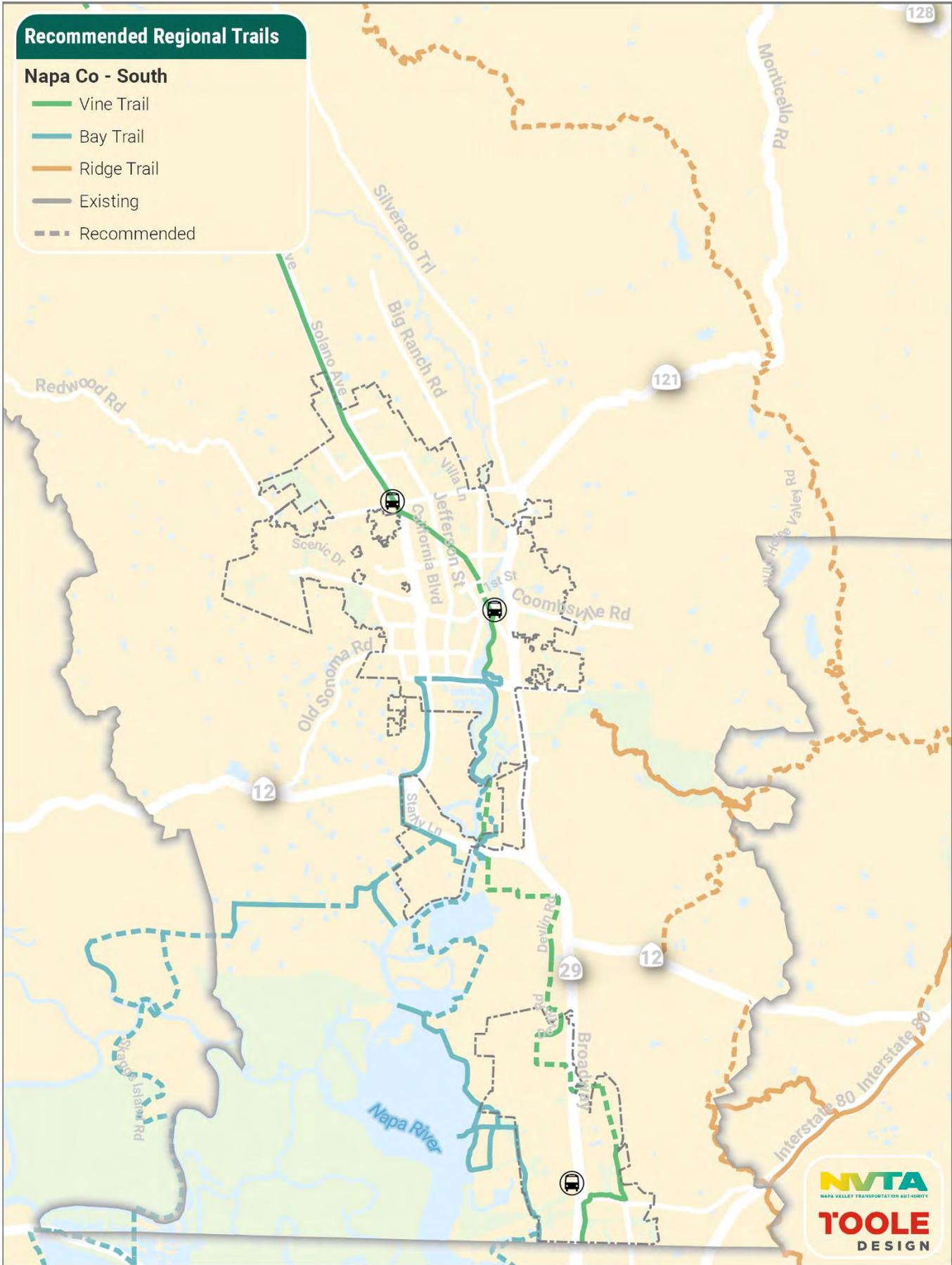


Figure 4.6. Proposed Regional Trails in Napa County – South  
Page 57

## PROPOSED SUPPORT PROGRAMS AND POLICIES

Policies and support programs are key components of a welcoming, bicycle-friendly community. Along with bike network investments, programs and policies will help Napa County communities realize the Plan’s goals of connectivity, equity, safety, and education and encouragement. Generally, policies are set by local or state government, while programs are led by or executed in partnership with external organizations or agencies such as advocacy organizations or school districts.

The programs and policies presented in Table 4.2 are proposed to be implemented by NVTAs. Proposed programs and policies for each jurisdiction are outlined in the jurisdictional plans (Chapters 6-11).

The League of American Bicyclists categorizes the five aspects of a Bicycle Community as follows:

**Engineering:** Creating safe and convenient places to ride and park

**Encouragement:** Creates a strong bike culture that welcomes and celebrates bicycling

**Education:** Gives people of all ages and ability levels the skills and confidence to ride

**Enforcement:** Ensures safe roads for all users

**Evaluation and Planning:** Plans for bicycling as a safe and viable transportation option

**Table 4.2. Recommended NVTAs Support Policies and Programs**

Support Policies/Program	Description	Plan Goals
Vision Zero Policy	Adopt a countywide Vision Zero policy and develop an action plan for implementing Vision Zero. Identify opportunities for funding for Vision Zero efforts, such as developing a Countywide database to inventory collision data and environmental factors, undertaking a comprehensive analysis to understand collision patterns, and facilitating an outreach process to identify community safety priorities and determine where to focus safety investments and improvements.	Safety
Existing Bikeways Policy	Develop a policy which specifies that existing bikeways should not be removed, unless an improved bikeway is being installed.	Connectivity; Safety
Bicycle Voucher Program (Bucks for Bikes)	Provides up to \$100 voucher for new bicycle purchased for commuting	Education & Encouragement
Bicycle Parking Program	Develop a bike parking program in which businesses, or others as appropriate, may apply for funds from NVTAs for the purchase of bicycle racks and/or lockers.	Education & Encouragement
Bike Share Program	Pursue opportunities for creating a Bike Share program designed to encourage making short distance trips by bicycle and to provide a transportation alternative for zero vehicle households	Education & Encouragement /Equity
Wayfinding	Create and install countywide bicycle wayfinding to help bicyclists navigate the roadway network with confidence and find their way past barriers, such as complex intersections or high-stress streets. Coordinate wayfinding across County jurisdictions.	Education & Encouragement

Support Policies/Program	Description	Plan Goals
Bicycle Friendly Community Status	Create a coordinated countywide effort towards applying for, and achieving, Bicycle Friendly Community status from the League of American Bicyclists. (The City of Calistoga became a Silver Bicycle Friendly Community in 2013, and the City of Napa became a Bronze Bicycle Friendly Community in 2016.)	Education & Encouragement
Bicycle Count Program	Develop bicycle count strategies that are implementable in the short-term and assist NVTA as it measures progress towards achieving the goal of 10 percent mode shift by 2035. See Appendix D for bicycle count program recommendations.	Safety; Education & Encouragement
Data Sharing Program	Maintain a comprehensive database of bikeways throughout Napa County and, to track progress, develop a process for jurisdictions to share updated project implementation/data with NVTA once projects are completed.	Connectivity
Dedicated Bicycle Staff	Identify a staff member at NVTA who is responsible for bicycle planning and the implementation of bicycle facilities and dedicate a percentage of their time to these efforts.	All
Dedicated Safe Routes to School funding	Pursue coordination of sources to ensure consistent funding for Safe Routes to School programming throughout the County's school districts.	Safety; Education & Encouragement
Bikeway Maintenance	Prioritize maintenance of roadways and removal of debris where bicycle facilities are present	Safety & Encouragement

## PERFORMANCE MEASURES

NVTA intends to monitor progress on the implementation of this Plan over time. Performance measures will be used to evaluate how implementation is progressing, whether policies are being established and implemented as planned, and whether plan goals are being achieved. Performance measures for the proposed bicycle network are presented in Table 4.3. Due to varying constraints, some targets may be more difficult to meet than others.

**Table 4.3. Performance Measures**

Plan Goal	Performance Measure	Performance Reporting
<b>Connectivity</b>	Number of bicycle facility projects constructed per year	Establish a construction pace of one bicycle capital project per year per smaller jurisdictions, two per year in American Canyon, and three per year in the City of Napa and Napa County. (Includes projects implemented with Measure T repaving/rehabilitation)
	Development of practice to review Bicycle Plan for all projects	Establish a formal practice of reviewing Bicycle Plan for all street resurfacing or construction projects, and development review applications
	Level of stress for bicyclists	By 2035 increase by 20% the mileage of roadways that have low levels of stress for bicyclists

Plan Goal	Performance Measure	Performance Reporting
<b>Equity</b>	Projects located in or serving Communities of Concern, other known areas of non-automobile ownership, or areas with historically less bicycle infrastructure	All projects are evaluated for location relative to equity areas, and at least one implemented each year within Napa County.
	Education and encouragement materials/programs created for underserved groups	Creation of programming and materials in partnership or reviewed by community groups that serve underserved populations; Creation of programming and materials in languages other than English
<b>Safety</b>	Number of reported bicycle collisions	Reduce the number of reported bicycle collisions by 50% from 2013-2016 average by 2029
	Number of serious injury and fatal bicycle collisions	Reduce the number of serious injury and fatal bicycle collisions to zero by 2035
<b>Education &amp; Encouragement</b>	Number of bicycle commuters	Increase bicycle mode share to 10% by 2035
	Number of Bicycle Friendly Community applications	All Napa County communities have applied for Bicycle Friendly Community status by 2024
	Number of students reached by SRTS programming	All K-8 schools within Napa County participate in SRTS programming by 2024

NVTA should devote staff time to creating an annual report that provides an update on the measures listed above and on progress toward implementation of plan infrastructure, policy, and program recommendations. Coordination will be necessary with the various jurisdictions to track several of these measures, and coordination will be necessary with the NCBC and NCOE regarding the Safe Routes to School reporting. This annual report will keep NVTA and its jurisdiction partners accountable for implementation of these Plan recommendations and continued improvement to the bicycling environment within Napa County.

## Chapter 5: Implementation Strategy

The infrastructure recommendations of this Plan will be implemented over time by the various jurisdictions within Napa County. Many on-street projects will be implemented as part of other resurfacing or construction projects. Generally, shared-use paths will be stand-alone projects, sometimes completed in coordination with new development in an area, and sometimes completed over a long period of time in segments as funding is available for these higher-cost facilities. Physical and environmental constraints can also impact the choice of implementation method and influence project phasing.

### IMPLEMENTATION METHODS

The means by which bicycle infrastructure is implemented vary depending on the facility type. This section discusses typical methods by which individual Napa County jurisdictions will grow their bicycle networks. The network recommendations of this plan are suited to the streets where they are located, but specific recommendations as to how each facility should be implemented will be determined by implementing agencies. Jurisdiction staff can consult this overview and the Facility Toolkit in Appendix A for further guidance.

#### *Resurfacing and Restriping*

One of the best opportunities Napa County jurisdictions have for implementing on-street bike facilities is the Measure T resurfacing and rehabilitation program. Resurfacing and rehabilitation entails paving some or all of an existing street section. In these cases, the addition of bike facilities may be accomplished simply through striping. Restriping also works within the existing street section width, but projects of this type can involve removing and replacing existing roadway striping to reconfigure the street for a bike facility.

Both methods allow for the reconfiguration of existing roadway space, which can take the form of narrowing travel lanes, or reallocating travel lanes or parking lanes to accommodate bike lanes or Class IV separated bike lane facilities. Each individual street will need to be studied at the time of implementation, and a community discussion about reallocation of space may be needed. Class III bicycle boulevard markings, shared lane markings, vertical traffic calming, and bikeable shoulders can also be implemented in conjunction with resurfacing and restriping.

#### *Reconstruction*

Street reconstruction projects also provide an opportunity to implement bike facilities. Reconstruction projects address a greater depth of the roadway, often fixing more significant maintenance and quality issues than what can be addressed through resurfacing. For bike facility implementation, the key difference is that some reconstruction projects can involve moving curbs to accommodate bike facilities or to implement traffic calming measures such as chicanes, curb extensions, or tighter curb radii. Reallocation of roadway space, as addressed above, and construction of vertical traffic calming elements is also possible with reconstruction projects. Most on-street recommendations in this plan can be implemented without acquisition of additional right-of-way, but where that is required, a project will require reconstruction rather than resurfacing.

In some cases, reconstruction offers the opportunity to reconfigure intersections so they work better for bicyclists. For example, removal of slip lanes can benefit bicyclists by removing a point of potential conflict with automobiles. Class IV separated bike lanes and shared-use paths can also be implemented in reconstruction projects where the roadway edge is being addressed.

### *Construction*

In this Plan context, “construction” refers to standalone projects. These are Shared-Use Path - Class I projects outside the right-of-way, or those that, while in the right-of-way, can be implemented outside the existing street. Construction projects can also include new bridges and underpasses intended for bicyclist and pedestrian travel, such as the planned SR 29 Bicycle and Pedestrian Undercrossing project in the City of Napa.

Minor construction may include roadway widening to accommodate bike lanes or shoulders along a roadway. This can occur along the entire length of the facility or at select locations with poor sightlines, where spot widening would provide dedicated space for bicyclists, helping lower the chance of collisions.

### *Approaches for Specific Facility Types*

#### **Bicycle Boulevards (Class III)**

Bicycle boulevards are intended to provide a continuous low-speed, low-volume riding experience for bicyclists. Streets in this Plan that are recommended for bike boulevards are, in many cases, already comfortable places to ride a bike for most people. However, where these streets cross major streets without signals or all-way stop signs, additional treatments may be needed to provide a seamless bicycling experience. When implementing bike boulevards, jurisdictions should focus first on these intersections. Without additional accommodation, bicyclists need to wait for a gap in high-volume, higher-speed traffic to cross these streets. Such challenging crossings present a barrier that may keep someone from making a trip by bike. Crossing improvements for bicyclists can take the form of bike crossing warning signage, rectangular rapid flashing beacons, pedestrian hybrid beacons, curb extensions, and median islands.

Offset crossings are also a key issue along bike boulevard routes. In cases where the route jogs along a major street, jurisdictions should note the location of existing traffic control and consider design treatments that allow riders to cross at that location. One technique used in bike boulevard design is a two-way bike facility on one side of the street between the offset streets (see Figure 5.1).



Figure 5.1. Two-way bike facility in Fort Collins, Colorado

Additional measures to be considered when designing for bike boulevard implementation are:

- Wayfinding to direct riders along local street routes with numerous turns
- Diversion of through traffic at intersections to maintain low traffic volumes

Information on these implementation tools is provided in Appendix A.

### Rural Bike Routes (Class III)

Rural bike routes in this Plan are largely intended for the “Somewhat Confident” and “Highly Confident” rider types. As such, they do not provide a great deal of separation from traffic, but there are a few key implementation approaches that can improve the riding environment, even on high-speed streets.

Jurisdictions should begin improving rural bike routes by identifying locations where sightlines are challenging. These most often occur at the crests of hills or on tight curves. Installation of warning signage indicating bicyclists on the roadway is recommended as a first step toward improving bicyclist safety at these locations (see Figure 5.2). Beyond that, spot widenings for bikeable (minimum three-foot) shoulders should be considered in these locations. Many of Napa County’s rural roads will have topography challenges at the roadway edge which may limit the ability to widen shoulders.



Figure 5.2. MUTCD W11-1 Bicycle Warning Sign

Where rural bike routes are adjacent to city and town boundaries or they enter or exit more developed areas, such as near Angwin, or, application of shared lane markings should be considered as well. Some of these rural bike routes may also warrant temporary signage during known recreational riding events to alert drivers to the presence of a significant number of bicyclists.

### Improving Existing Bike Lanes (Class II)

There are numerous existing bike lanes in Napa County that could be improved with recommended treatments from the Facility Toolbox, especially near intersections. When resurfacing streets with existing bike lanes, jurisdictions should consider application of treatments such as appropriate placement of bike lanes with respect to turn lanes, highlighted marking of conflict areas, and continuation of bike lanes through intersections to indicate riders' path of travel.

## PROJECT PHASING

All jurisdictions within Napa County have limited funding for implementing the facilities recommended in the bicycle network of this Plan. While the 6.67 percent (collective) Equivalent Funds requirement for Class I under the Measure T ordinance is a known current source of funding<sup>18</sup>, this Plan recognizes that availability of other needed funds is uncertain at this time. In light of this, jurisdictions should bear several implementation approaches and priorities in mind when phasing projects.

Individual projects in this Plan consist of a network recommendation that is defined by the following criteria:

- Within one jurisdiction
- Consisting of one facility type
- Located on one street

Each project may be implemented one at a time, though implementing adjacent bicycle boulevard projects along a single route would be advantageous for bicycle connectivity.

### *Immediate-Term*

Every jurisdiction's Measure T five-year repaving plan has been reviewed against the recommended bicycle network, and overlaps are indicated in the individual jurisdiction plans. These on-street bicycle facility recommendations should be reviewed immediately for potential integration into striping plans.

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<sup>18</sup> In order for Project Sponsors to receive Measure T revenues, jurisdictions collectively must demonstrate that at least 6.67% of the amount (referred to as "Equivalent Funds") of Measure T revenues received each year is being committed to Class I facilities identified in the adopted Countywide Bicycle Plan/Active Transportation Plan, using funds not derived from the Measure T Ordinance.

### *Short- and Medium-Term*

All other planned street resurfacing and reconstruction projects should be reviewed against the recommended bike network. Another early step in the implementation of the bicycle plan should be to answer the following questions about each project:

- Does a facility consist only of striping and signage that can be added at any time?
- Does a facility necessitate further community dialog regarding reallocation of street space?
- Does a project need significant funding that must be obtained through a competitive process (i.e., grant)?
- Does a project necessitate acquiring additional right-of-way?
- Are there any environmental concerns about a project location?

These questions can help direct staff to understand which projects are more readily implementable.

Additionally, public input received over the course of this Plan process indicates greater interest in connecting to certain destinations including: schools, parks, trailheads, and community centers. The locations of these destinations, as well as other known bicycle traffic generators such as hotels with bike rental schemes should be considered when selecting projects for earlier implementation.

### *Long-Term*

Some projects, such as many Class I shared-use paths, will necessarily require a more sustained effort to come to fruition. While it may take a longer time to implement these projects, jurisdictions should begin to consider the steps toward construction of these projects so they are prepared for grant applications or inserting funding into capital improvement plans, including the 6.67 percent Equivalent Funds commitment submitted every other year with the 5-year Measure T paving program.

### *Connectivity Improvements from Phased Implementation*

As stated, the planned bicycle facilities for Napa County are intended to create the most low-stress network that conditions allow. Implementation of on-street facilities such as bike boulevards (Class III) and bike lanes (Class II) will significantly improve the connectivity of the bicycle network for riders of all ages and abilities. Focusing first on intersection treatments at locations where these facilities cross high-speed, high-volume streets without a traffic signal will most quickly improve connectivity.

While shared-use paths (Class I facilities) provide a low-stress riding environment for all types of bicyclists, their implementation requires more investment and often more planning than on-street facilities. The connectivity improvements provided by these higher-cost, higher-effort facilities supplement improvements from on-street facilities, but it is understood that these improvements are more likely to be long-term projects.

## COST ESTIMATION

Planning-level cost estimates were developed for the projects recommended in this Plan to help jurisdictions plan for budgeting and to provide information for grant applications. As noted, each of the facility types recommended can be implemented in several different ways. High- and low-end cost estimates are provided for Class II and Class IV facilities based on differing means of implementation.

There will also be variations in the actual facilities themselves: for instance, different rural bike route sections may have two spot shoulder widenings per mile or none. Similarly, a Class I path may be anywhere from eight to twelve feet depending upon available space and projected volumes, and a bike boulevard may include intersection improvements ranging from low-cost wayfinding signage to more expensive construction of a median island and installation of rectangular rapid flashing beacons. The cost estimates provided assume an average level of treatment and will need more refinement when projects move to design.

Further detail about assumptions included in the per-mile estimates in Table 5.1 are included in Appendix G.

**Table 5.1 Planning Level Cost Estimates for Bicycle Facilities<sup>19</sup>**

Facility Types	High/Low	Cost per Mile
Shared-Use Path – Class I		\$ 1,170,000.00
Bicycle Lanes - Without Buffer – Class II	Low	\$ 60,000.00
Bicycle Lanes - Without Buffer – Class II	High	\$ 190,000.00
Bicycle Lanes - With Buffer – Class II	Low	\$ 90,000.00
Bicycle Lanes - With Buffer – Class II	High	\$ 230,000.00
Bike Boulevards (Shared Lanes) – Class III		\$ 120,000.00
Rural Routes (Shared Lanes) – Class III		\$ 40,000.00
Separated Bike Lanes – Buffer + Posts – Class IV		\$ 110,000.00
Separated Bike Lanes - Concrete Curb – Class IV		\$ 750,000.00

<sup>19</sup> Planning level cost estimates do not include the cost of right-of-way acquisition which can significantly increase the per-mile cost of facility implementation.

## FUNDING OPPORTUNITIES

Grants present an opportunity to secure funding for implementing the Proposed Bicycle Network, and the jurisdiction’s General and Capital Improvement Program (CIP) funds can be used to leverage regional, state, and federal funding. See Table 5.2 for a summary of available grants.

Table 5.2. Potential funding sources for bicycle programs and projects

Funding Sources	Administering Agency	Availability of Funding	Notes	Eligible Improvements	Eligible for Measure T Equivalent Funds	Weblink
<b>Countywide Funding Sources</b>						
<b>One Bay Area Grant (OBAG) 2 Program</b>	Napa Valley Transportation Authority	OBAG current round of funding funds projects from 2017/18 - 2021/22	Infrastructure projects that reduce vehicle trips, including pedestrian and bicycle facilities. Funded by the federal Surface Transportation Program and Congestion Mitigation and Air Quality Improvement (CMAQ) Program.	Bikeways and crossing improvements.	Yes	<a href="https://mtc.ca.gov/our-work/fund-invest/federal-funding/obag-2">https://mtc.ca.gov/our-work/fund-invest/federal-funding/obag-2</a>
<b>Measure T Equivalent Funds</b>	Napa Valley Transportation Authority	Varies-Other non-Measure T funds (Gas tax, general funds etc.) from non-competitive sources	Supplementing Measure T, jurisdictions (collectively) are required to commit funds from other sources equivalent to 6.67% of the annual Measure T revenue collected	Funds the construction or maintenance of Class I facilities	N/A	<a href="http://www.nvta.ca.gov/measure-t">http://www.nvta.ca.gov/measure-t</a>
<b>Measure T</b>	Napa Valley Transportation Authority	Funding allocated to municipal and county governments in Napa County	Funded through a half-cent sales tax	Measure T funds local street and road rehabilitation and supporting infrastructure. Jurisdictions are subject to complete streets requirements so when upgrades are appropriate, Class 2 and 4 facilities can be funded with Measure T.	N/A	<a href="http://www.nvta.ca.gov/measure-t">http://www.nvta.ca.gov/measure-t</a>
<b>Transportation Development Act Article 3</b>	Metropolitan Planning Commission/ Napa Valley Transportation Authority	Annual/Allocation -NVTA programs funds for three years. Current program is FY 2018-19 through 2020-21	Funds plans (once every 5-years per jurisdiction), safety education (not more than 5% of total annual allocation), and design and construction of capital projects. Each county coordinates a consolidated annual request for projects to be funded in the county.	Bikeways, crossing improvements and safety/education/training programs for school children and the general population.	Yes	<a href="https://mtc.ca.gov/our-work/fund-invest/investme nt-strategies-commitments/tr ansit-21st-century/funding-sales-tax-and-0">https://mtc.ca.gov/our-work/fund-invest/investme nt-strategies-commitments/tr ansit-21st-century/funding-sales-tax-and-0</a>

Funding Sources	Administering Agency	Availability of Funding	Notes	Eligible Improvements	Eligible for Measure T Equivalent Funds	Weblink
<b>Transportation Fund for Clean Air (TFCA)</b> Program Manager Funds (40%)	Bay Area Air Quality Management District/NVTA	Annual-NVTA now programs funds for three years- Funds are currently programmed for FY2019-20 through 2021-22	Funds projects that improve air quality. Must meet cost-effectiveness requirements	Bicycle and pedestrian projects-capital projects only	Yes	<a href="http://www.baaqmd.gov/grant-funding/public-agencies/regional-fund">http://www.baaqmd.gov/grant-funding/public-agencies/regional-fund</a>
<b>Regional Funding Sources</b>						
<b>Regional Active Transportation Program</b>	Metropolitan Transportation Commission	Varies; the last "Cycle" of projects (Cycle 3.5) was accepted in August 2017	Consolidation of several older grant programs, including State SR2S and Bicycle Transportation Account. Funds a wide range of capital and non-capital projects. Both programs give some preference to projects in disadvantaged communities. The state program is competitive among jurisdictions statewide; the regional program is competitive among Bay Area jurisdictions.	Bikeways, crossing improvements and most programmatic activities.	No	<a href="http://www.mtc.ca.gov/funding/ATP">www.mtc.ca.gov/funding/ATP</a>
<b>Transportation Fund for Clean Air Regional Fund (60%)</b>	Bay Area Air Quality Management District	Annually (last submittals were due in April 2017)	Funds bicycle facilities, including paths, lanes, routes, lockers and racks. The Regional Fund is competitive among Bay Area jurisdictions	Bikeways and bicycle crossing improvements.	No	<a href="http://www.baaqmd.gov/grant-funding/publicagencies/regional-fund">www.baaqmd.gov/grant-funding/publicagencies/regional-fund</a>
<b>Bicycle Rack Voucher Program</b>	Bay Area Air Quality Management District	Ongoing; last cycle closed in June 2016	Vouchers for up to \$60 per bicycle parking space created (up to \$15,000 per applicant per year. Racks must be installed within one-tenth of a mile of at least one major activity center and maintained in service for at least three years. Available only to public agencies.	Bicycle parking racks	No	<a href="http://www.baaqmd.gov/grant-funding/public-agencies/brvp">http://www.baaqmd.gov/grant-funding/public-agencies/brvp</a>
<b>State Funding Sources</b>						
<b>State Active Transportation Program</b>	Caltrans	Varies; next call for projects will be in Spring 2020.	Consolidation of several older grant programs, including State Safe Routes to School and Bicycle Transportation Account. Funds a wide range of capital and non-capital projects. Both programs give some	Bikeways, crossing improvements and most programmatic activities.	No	<a href="http://www.dot.ca.gov/hq/LocalPrograms/atp">www.dot.ca.gov/hq/LocalPrograms/atp</a>

Funding Sources	Administering Agency	Availability of Funding	Notes	Eligible Improvements	Eligible for Measure T Equivalent Funds	Weblink
			preference to projects in disadvantaged communities. The state program is competitive among jurisdictions statewide; the regional program is competitive among Bay Area jurisdictions.			
<b>California Office of Traffic Safety grants</b>	California OTS	Annually	For traffic-safety education, awareness and enforcement programs aimed at drivers, pedestrians and cyclists.	Certain activities under the SR2S, safety/education and enforcement programs.	No	<a href="http://www.ots.ca.gov/Grants/default.asp">www.ots.ca.gov/Grants/default.asp</a>
<b>California State Parks Recreational Trails Program (RTP)</b>	California Department of Parks and Recreation and Caltrans Active Transportation Program	Next cycle is scheduled for 2019.	Applicants are required to provide a 12 percent match.	Recreational trails and trail-related projects, including Class I bicycle paths	No	<a href="https://www.parks.ca.gov/?page_id=24324">https://www.parks.ca.gov/?page_id=24324</a>
<b>Highway Safety Improvement Program</b>	Caltrans	Varies; most recent call for projects was in spring 2018 with projects selected in November 2018	For projects and programs that reduce traffic fatalities and serious injuries by correcting or improving a specific problem. Highly competitive at the state level.	Safety-related pedestrian, bikeway and crossing projects. Certain activities under the SR2S, safety/education and enforcement programs; also, certain spot improvements.	No	<a href="http://www.dot.ca.gov/hq/LocalPrograms/hsip.html">www.dot.ca.gov/hq/LocalPrograms/hsip.html</a>
<b>Affordable Housing and Sustainable Communities Program</b>	California Strategic Growth Council	Annually; last call for projects will close February 2019	Projects that facilitate compact development, including bicycle infrastructure and amenities, with neighborhood scale impacts. Available to government agencies and institutions (including local government, transit agencies and school districts), developers and non-profit organizations.	Bikeways and crossing improvements, particularly those in the area covered in specific plans	No	<a href="http://www.sgc.ca.gov/Grant-Programs/AHSCPogram.html">www.sgc.ca.gov/Grant-Programs/AHSCPogram.html</a>

# Chapter 10: City of American Canyon Bicycle Plan

## SECTION 1: INTRODUCTION

### *Plan Introduction*

The American Canyon Bicycle Plan is intended to guide development of infrastructure, programs, and policies that improve the bicycling environment for all residents and visitors in this Napa Valley community. American Canyon’s Plan will help the City work towards the adopted goals for bicycling in Napa County: connectivity, equity, safety, and education and encouragement. Planning and design for bicycling has evolved since adoption of the American Canyon Bicycle Plan in 2012, and this Plan update brings the latest best practices to bear on recommendations for implementation by City staff.

### *Area Overview*

The City of American Canyon is located at the southern end of Napa County, approximately 35 miles northeast of San Francisco. Incorporated in 1992, American Canyon is the youngest community in Napa County. One of the two Priority Development Areas (PDA) in Napa County is in American Canyon along the SR 29 corridor. The Napa County Airport adjoins the City on the north, and the City of Vallejo in Solano County shares a contiguous border with American Canyon on the south. State Route (SR) 29, which runs north-south, bisects American Canyon. American Canyon Creek, a tributary of the Napa River, runs through the City.

The City of American Canyon has a population of approximately 20,000 residents. It has a compact land use pattern, with relatively low-volume streets and a well-developed network of sidewalks and pathways. The community’s small land area and mostly flat topography create many opportunities for residents to bicycle (see Figure AC.1). Residential housing, commercial, and industrial uses are the predominant land use types in American Canyon.



**Figure AC.1. Bicyclist on Benton Way adjacent to Community Park 2.**

Many people who work in Upper Napa Valley live in American Canyon or Vallejo, and SR 29 through American Canyon has a high volume of daily traffic with people commuting to and from work. Due to the high traffic volumes and lack of alternatives routes, bicycling between American Canyon and Napa, or crossing SR 29 from east to west, is uncomfortable for any but the most intrepid bicyclists.

American Canyon’s location within Napa Valley and local attractions make it a popular destination for tourists. Popular activities in the area include winery tours, exploring the Napa River and Bay Trail on foot or bike, birdwatching in San Pablo Bay, and golfing.

American Canyon is a part of the Napa Valley Unified School District which also serves the City of Napa and Town of Yountville. The city is home to five public schools: Donaldson Way Elementary School (grades K-5), Canyon Oaks Elementary School (grades K-5), Napa Junction Magnet Elementary School (grades K-5), American Canyon Middle School (grades 6-8), and American Canyon High School (grades 9-12). Donaldson Way Elementary, Canyon Oaks Elementary, Napa Junction Magnet Elementary, and American Canyon High School are located on Donaldson Way, Silver Oak Trail, Napa Junction Road, and Newell Drive, respectively, all of which have no bicycle infrastructure. American Canyon Middle School is located on Benton Way, which has bike lanes (Class II). Currently, bicycling to school can be difficult for students, and SR 29 creates an additional barrier.

### *Relationship to Existing Plans*

This 2019 Bicycle Plan is an update to the 2012 American Canyon Bicycle Plan and builds upon the recommendations on bikeways, policies, programs, and design standards detailed in the Broadway District Specific Plan (in progress), the SR 29 Gateway Corridor Improvement Plan (2014), and the General Plan (1994). In addition, this 2019 Plan incorporates applicable recommendations from the 2016 Napa Countywide Pedestrian Plan and establishes an implementation plan to encourage more walking trips throughout Napa County and improve safety for all users.

For more information about these plans, see Appendix D of the 2019 Napa Countywide Bicycle Plan.

## SECTION 2: GOALS AND POLICIES

### Countywide Vision and Goals

The Countywide vision statement, goals, and policies were developed to guide recommendations in both the Countywide Plan and the jurisdiction plans, including the American Canyon Bicycle Plan. The vision statement, goals, and policies will be used to evaluate progress of Plan implementation.

#### Vision Statement

Napa County’s vision is to be a bicycle-friendly community with a world-class bicycling system for all ages and abilities. The comprehensive, connected bicycle system will provide people with safe, convenient and enjoyable access to destinations throughout all Napa County jurisdictions and beyond. Residents and visitors will enjoy bicycling for everyday commuting, non-work trips and recreation. Bicycling contributes to a high quality of life, promotes health and will help achieve a 10 percent mode shift in Napa County by 2035.

#### Goals and Policies

The goals and policies developed for the 2019 Plan will guide American Canyon and other Napa County communities in improving the bicycling environment for residents and visitors.

**Table AC.1. Goals and Policies of the Plan**

Goals		Policies
<b>Connectivity</b>	Develop a well-designed low Level of Traffic Stress (LTS) connected bicycle network	<ul style="list-style-type: none"> <li>• Build and maintain a local and countywide bicycle transportation and recreation network that connects Napa County’s incorporated cities/town and unincorporated communities and provides access to public transportation and community destinations.</li> <li>• Develop and maintain continuous low Level of Traffic Stress (LTS) bicycle facilities of all types to provide accessible intra-city connections that serve as the framework of the Countywide Bikeway System.</li> <li>• Prioritize coordination and completion of regionally significant primary bikeways including the Napa Valley Vine Trail, the Bay Trail and the Ridge Trail, and local connections to those facilities.</li> <li>• Provide secure bicycle parking at public and private destinations throughout Napa County.</li> <li>• Integrate the bicycle network and bicycle facility amenities into land use decisions and developments.</li> </ul>
<b>Equity</b>	Improve bicycle access for disadvantaged and/or underserved communities	<ul style="list-style-type: none"> <li>• Implement projects that improve access for disadvantaged and/or underserved communities, particularly those reliant on walking, biking and transit for transportation.</li> </ul>

Goals		Policies
<b>Safety</b>	Improve safety for all ages and abilities	<ul style="list-style-type: none"> <li>• Work to reduce the number and severity of bicycle collisions.</li> <li>• Work to reduce bicycle fatalities to zero by 2035.</li> <li>• Improve locations that have high incidences of bicycle collisions, and/or impediments or conflicts to bicyclists.</li> <li>• Implement Complete Streets policies that ensure accommodation and enable safe access for users of all ages and abilities.</li> <li>• Implement appropriate, well-designed bicycle facilities using accepted design standards, including intersection and other crossing improvements.</li> </ul>
<b>Education &amp; Encouragement</b>	Increase mode share of bicycling	<ul style="list-style-type: none"> <li>• Encourage education programs for all users of the roadway in all jurisdictions and school districts.</li> <li>• Develop programs and public outreach materials to promote safety and the positive benefits of bicycling.</li> </ul>

### *Serving All Types of Bicyclists*

Many factors contribute to people choosing to ride a bicycle, with a major factor being the rider’s perception of safety. A rider’s perception of an unsafe route can be related to numerous things but is most often related to riding adjacent to high-traffic and high-speed roadways or crossing busy intersections with little or no separation from vehicles. Research has found that a large percentage of the American population is interested in bicycling for transportation but does not currently do so because they believe the routes they would need to travel are unsafe or feel uncomfortable. Many people feel safer and more comfortable riding on low-traffic, low-speed streets or on facilities that provide protection or physical separation from fast-moving traffic.<sup>36</sup> Most people in the U.S. – between 50 and 60 percent – have little tolerance for interacting with motor vehicle traffic unless volumes and speeds are very low (see Figure 2.1).<sup>37</sup> This group of riders is referred to as “Interested but Concerned,” reflecting both their interest in bicycling for transportation as well as concerns about safety and comfort when interacting with motor vehicle traffic.

This framework of rider types was used to assess the existing bicycle network and to select recommended facility types for the 2019 Plan. This rider type has the highest potential for increasing bicycle mode share if facility types that support and encourage biking are available.

<sup>36</sup> Source: Dill, J. McNeil, N. “Revisiting the Four Types of Cyclists: Findings from a National Survey” Transportation Research Board 95<sup>th</sup> Annual Meeting, 2016.

<sup>37</sup> Studies, such as the one referenced above, show that approximately one third of the adult population is not currently interested in bicycling or able to bicycle.

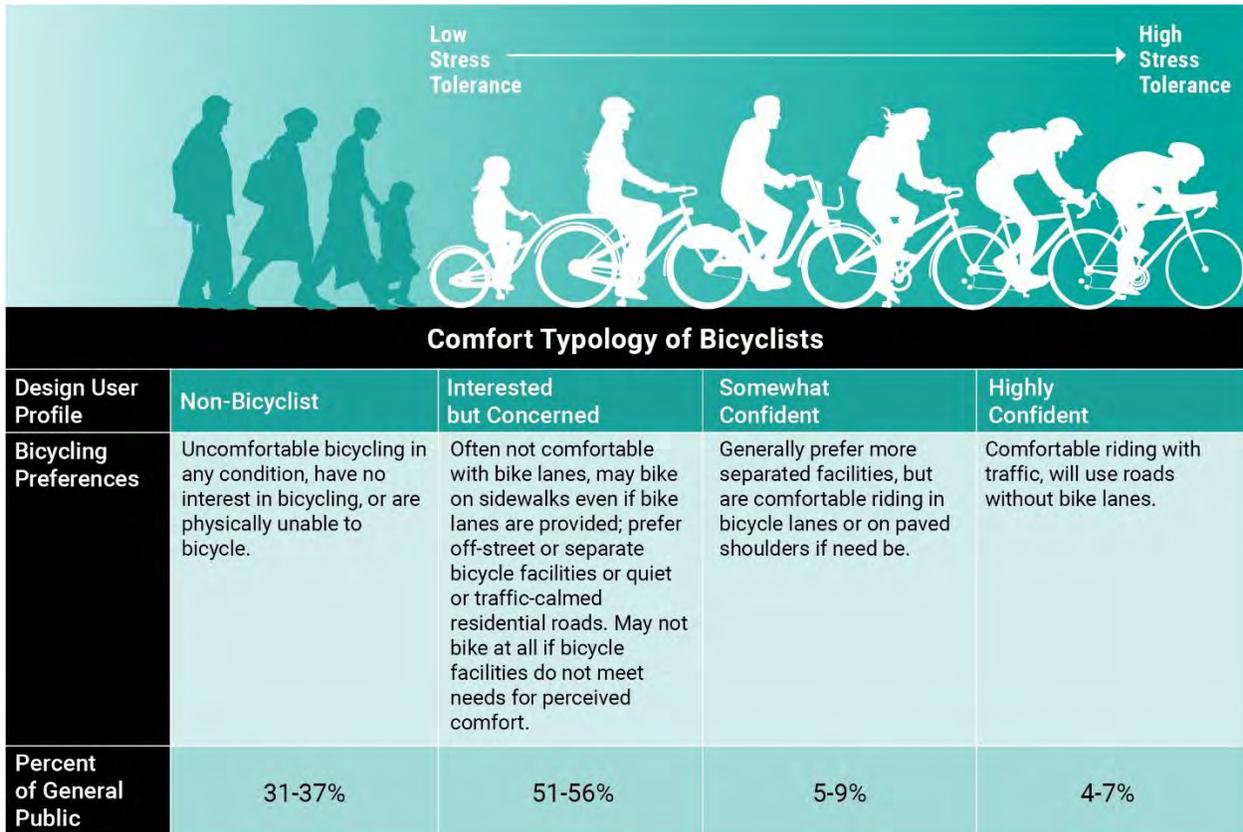


Figure AC.2. Level of Traffic Stress and Bicycle Riders

## SECTION 3: EXISTING BICYCLE NETWORK

### *Overview: Issues and Opportunities*

Currently, American Canyon’s bicycle network consists Class I shared-use paths, for example a segment of the Bay Trail adjacent to Wetlands Edge Road (see Figure AC.2), and Class II bike lanes, for example, along American Canyon Road.

American Canyon has limited on-street bike facilities. Bike lanes (Class II) exist on only several of the city’s roadways, and existing bike lanes are typically disconnected from one another, do not provide citywide connectivity or access to major destinations, and are striped in short segments less than one mile in

length. Generally, due to the low traffic volumes and speeds, many local streets are comfortable for bicycling, even without bicycle facilities or signage. Connections to destinations, such as businesses located on SR 29 and schools, could be improved to provide more connectivity. Figure AC.3 illustrates the existing bicycle network, and Table AC.2 provides an overview of the existing bikeway mileage in American Canyon.



Figure AC.3. Bay Trail along Wetlands Edge Road

Table AC.2. Existing Bicycle Network Mileage

Facility Type	Existing Mileage
Vine Trail (Class I)	2.4
Shared-Use Path (Class I)	7.3
Bike Lane (Class II)	1.6
Bike Route (Class III)	1.8
<b>TOTAL</b>	<b>13.1</b>

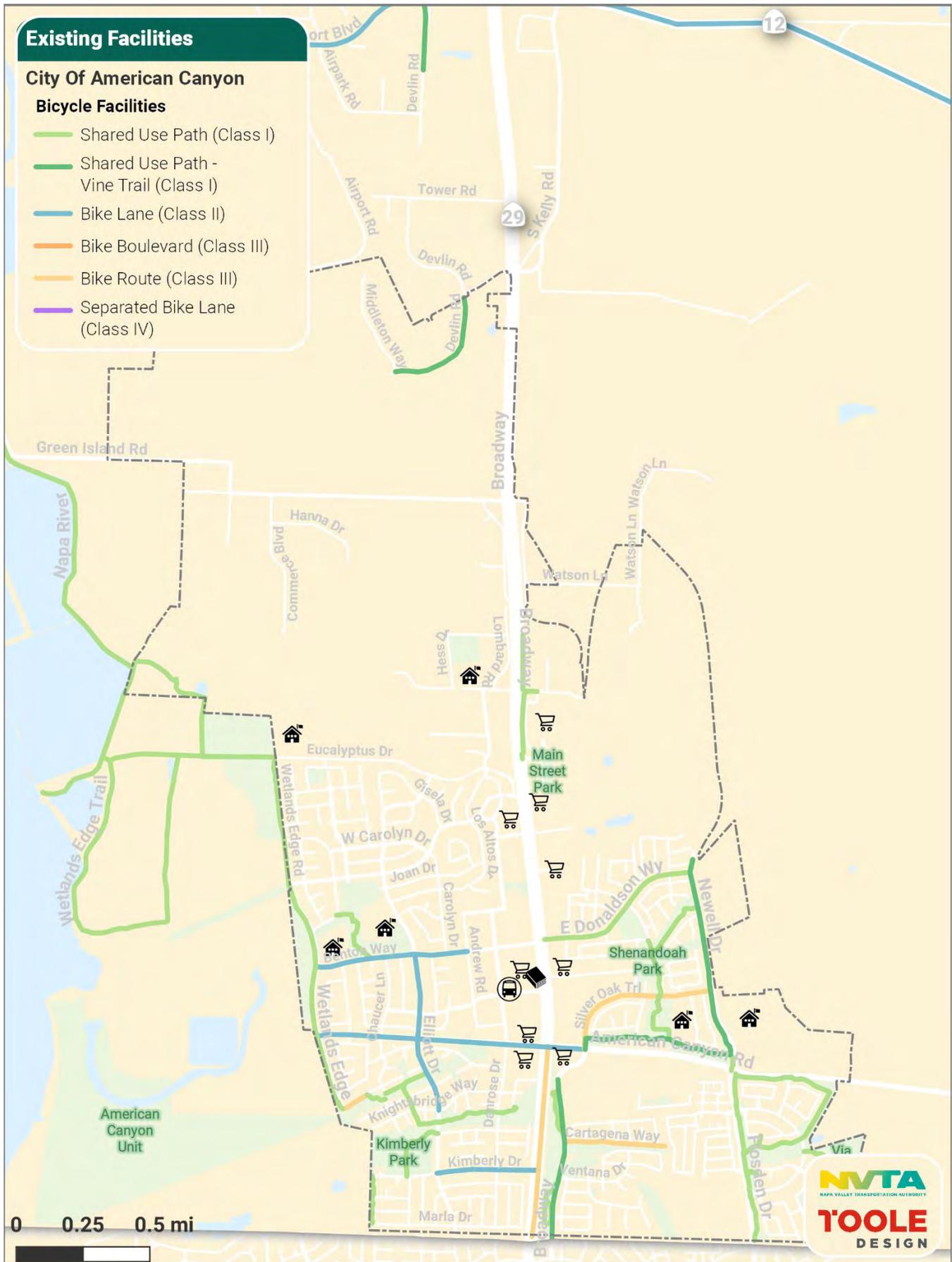


Figure AC.4. Existing Bicycle Facilities in American Canyon

## Components of the Bicycle Network

Multiple bicycle facility types comprise a complete bicycle network, and each facility type has a different classification to distinguish the facilities. The classifications are based on the degree of physical separation from vehicle traffic. The following facility types reflect the existing bikeways as well as new ones identified in this Plan.

### Shared-Use Paths

Shared-Use Path (Class I) are two-way paved facilities, physically separated from motor vehicle traffic and used by bicyclists, pedestrians, and other non-motorized users. Shared-use paths are often located in an independent alignment, such as a greenway, though sometimes they are located adjacent to roadway. Shared-use paths provide low-stress facilities for bicyclists. Examples of shared-use paths in American Canyon include:

- Segments of the Vine Trail - The Vine Trail is a 47-mile active transportation corridor that is under development and will connect the Vallejo Ferry Terminal in southern Solano County to Calistoga in northern Napa County.
- Wetlands Edge Road Trail, part of the Bay Trail (see Figure AC.4) - Parking and trailheads are available at the Wetlands Edge Viewing Area which offer trail options for recreational biking and hiking.
- Several shared-use paths in parks and utility rights-of-way.



Figure AC.5. Wetlands Edge Trail, part of the Bay Trail, in American Canyon

Shared-use paths (Class I) in American Canyon are generally narrow, with width ranging from eight to 10 feet. Although some of these shared-use paths are substandard in width compared to best practices for Class I design, they provide neighborhood connections or cut-throughs to destinations. These segments are identified in this Plan since they are separated from automobile traffic and provide important desired connections within the bicycle network.<sup>38</sup>

The Vine Trail is a key active transportation corridor that is becoming the backbone of Napa County's low-stress bicycle network. The completed Vine Trail will connect all Napa County jurisdictions as part of a 47-mile shared-use trail between the Vallejo Ferry Terminal and Calistoga. The Napa Valley Vine Trail Coalition and NVTa are actively working on planning, design, and construction of trail segments throughout the county.

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<sup>38</sup> Eight feet is the typical recommended minimum for any shared-use path. Some small connector paths in the county are as narrow as four feet.

## Bike Lanes

Bike Lane (Class II) provide an exclusive space for bicyclists in the roadway and are established by painting lines and symbols on the roadway surface. Bike lanes are for one-way travel and are typically provided in both directions on two-way streets and/or on one side of a one-way street (see Figure AC.5). Examples of bike lanes in American Canyon include American Canyon Road, Elliott Drive, and Benton Way.

Bike lanes create a lower-stress riding environment on streets with a maximum posted speed limit of 30 miles per hour and traffic volumes between 3,000 and 8,000 vehicles per day. Many of the bicycle lanes in Napa County are on roadways with higher speeds, such as American Canyon Road, which can result in a stressful bicycling environment for many bicyclists, including Interested but Concerned bicyclists. Some of these facilities are well used, however, by the many Napa County residents and visitors who are more comfortable with bicycling in high-speed environments.

Buffered Bike Lanes (Class II) are implemented by painting or otherwise creating a flush buffer zone between a bicycle lane and the adjacent travel lane (see Figure AC.6). While buffers are typically used between bike lanes and motor vehicle travel lanes to increase bicyclists' comfort, they can also be installed between bicycle lanes and parking lanes to reduce conflicts with opening car doors. When located on streets with moderate traffic volumes and speeds, buffered bike lanes provide a lower-stress riding environment for bicyclists. No buffered bike lanes exist today in American Canyon or elsewhere in Napa County.



Figure AC.6. Bike lane on Benton Way in American Canyon



Figure AC.7. Buffered bike lane in Seattle, WA

## *Bike Routes and Bicycle Boulevards*

Bike Routes and Bicycle Boulevards are two types of Class III facilities in Napa County.

Bike routes are designated with pavement markings or signage to indicate a shared lane environment between bicyclists and drivers (see Figure AC.7, an example in nearby St. Helena). Examples of bike routes in American Canyon include American Canyon Road, Benton Way, Kimberly Drive, Elliot Drive, and Broadway Street (also SR 29).

While signage and markings support wayfinding and indicate bicyclist positioning on shared streets, bicycle routes do not provide any protection or separation between people driving and people bicycling. When located on streets that have high traffic speeds and/or volumes, bike routes are uncomfortable and most people will choose not to ride on them.

Bicycle boulevards are also indicated with pavement markings and signage, but are specifically located on low-speed, low-volume streets, often in residential neighborhoods. Bicycle boulevards are designed to prioritize bicycle through-travel, while reducing motor vehicle through traffic volumes and maintaining relatively low speeds. When paired with intersection treatments that help bicyclists cross major intersections, bicycle boulevards are an attractive, low-stress facility. Currently, there are no bicycle boulevards in American Canyon.



Figure AC.8. Bike route in nearby St. Helena

## **Separated Bike Lanes**

Separated Bike Lanes (Class IV) are an exclusive bikeway facility type that combines the user experience of a shared-use path with the on-street elements of a conventional bike lane (see Figure AC.8). They are recommended for roadways with speeds higher than 30 miles per hour and motor vehicle volumes over approximately 6,500 vehicles per day. Separated bike lanes are physically separated from motor vehicle traffic with a vertical element and are distinct from the sidewalk. They can be located at street level within the curbs, at an



Figure AC.9. Separated bike lane in Berkeley, CA

intermediate level, or at sidewalk level, see Figure AC.9 below. Numerous options are available for creating separation between modes, ranging from low-cost paint and plastic flexpost installations, to more robust curb-separated lanes. Separated bike lanes provide a low-stress riding environment to all bicyclists. No separated bike lanes currently exist in American Canyon or elsewhere in Napa County.

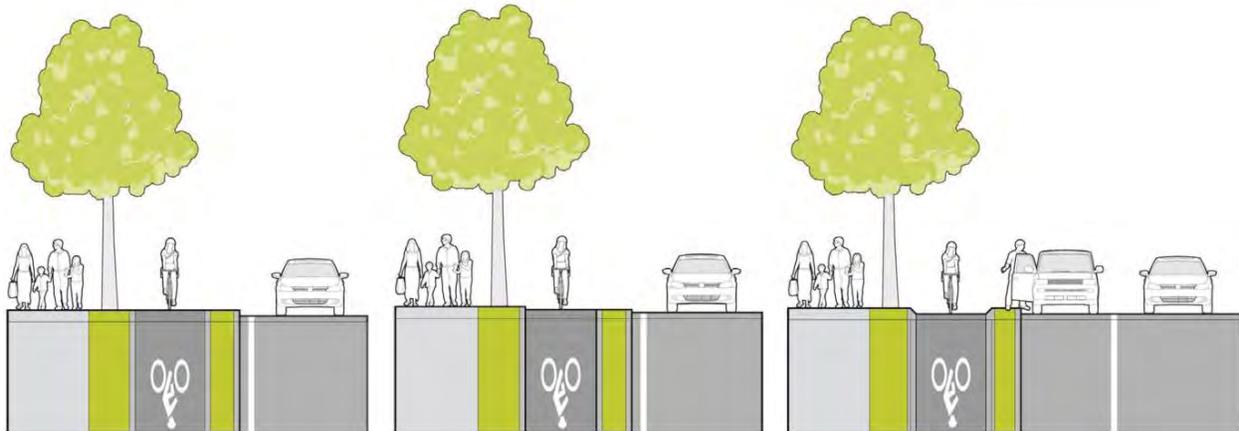


Figure AC.10. Sidewalk level, intermediate level, and street level separated bike lanes, left to right.

### *How many people bike today?*

Some residents within the municipalities and Napa County choose to bicycle to work, and data is readily available regarding residents' commuting mode choice from the U.S. Census' American Community Survey (ACS). In American Canyon, approximately 0.4 percent of residents commute by bicycle which is half of the county's mode share of 0.8 percent. However, work-related trips only comprise 10 to 15 percent of all household trips; the remaining 85 to 90 percent of trips are made to visit friends and family or for errands, entertainment, outings, and recreation.<sup>39</sup>

The assumption can be made that Napa County residents are generally more likely to bike for non-work trips. This is because non-work destinations, such as an errand or a friend's house, are likely to be located closer to home.

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<sup>39</sup> Range references the National Household Travel Survey (15 percent) and California Household Travel Survey (9.9 percent).

## *Collision Analysis*

Improving safety for bicyclists is an expressed goal of the 2019 Countywide Bicycle Plan and preventing and mitigating bicycle collisions is a key consideration behind the network recommendations for American Canyon. Not only is safety and the reduction of bicycle collisions a public health issue, addressing safety concerns is also an important way to encourage more people to ride a bicycle. Understanding collision factors and trends will allow the City to identify and prioritize investments that can have the greatest impact on improving safety for bicyclists and other users of the roadway.

To better understand collision history in American Canyon, injury crash data from 2006-2013 were reviewed.<sup>40</sup> American Canyon has relatively few bicycle crashes reported during this seven-year period, and the crashes that occurred are geographically disbursed. That said, Broadway and American Canyon Road, combined, were the locations of seven of the city's 18 crashes. In general, bicycle collisions in American Canyon were less severe (11 percent were severe, no fatalities), and were caused by either a broadside hit (33 percent) or an unidentified "Other" (22 percent). Collision factors were varied, with "Signals and Signs" and "Wrong Side of the Road" as the major identified reasons for the crash. See Figure AC.10 for a map of bicycle collisions.

The crashes that are mapped and analyzed only include those reported to police. There may be additional unreported crashes, and near misses, that have occurred during this time that influence people's decision to ride a bike.

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<sup>40</sup> Collision data was gathered from the University of California-Berkeley's Safe Transportation Research and Education Center's Transportation Injury Mapping System (TIMS).

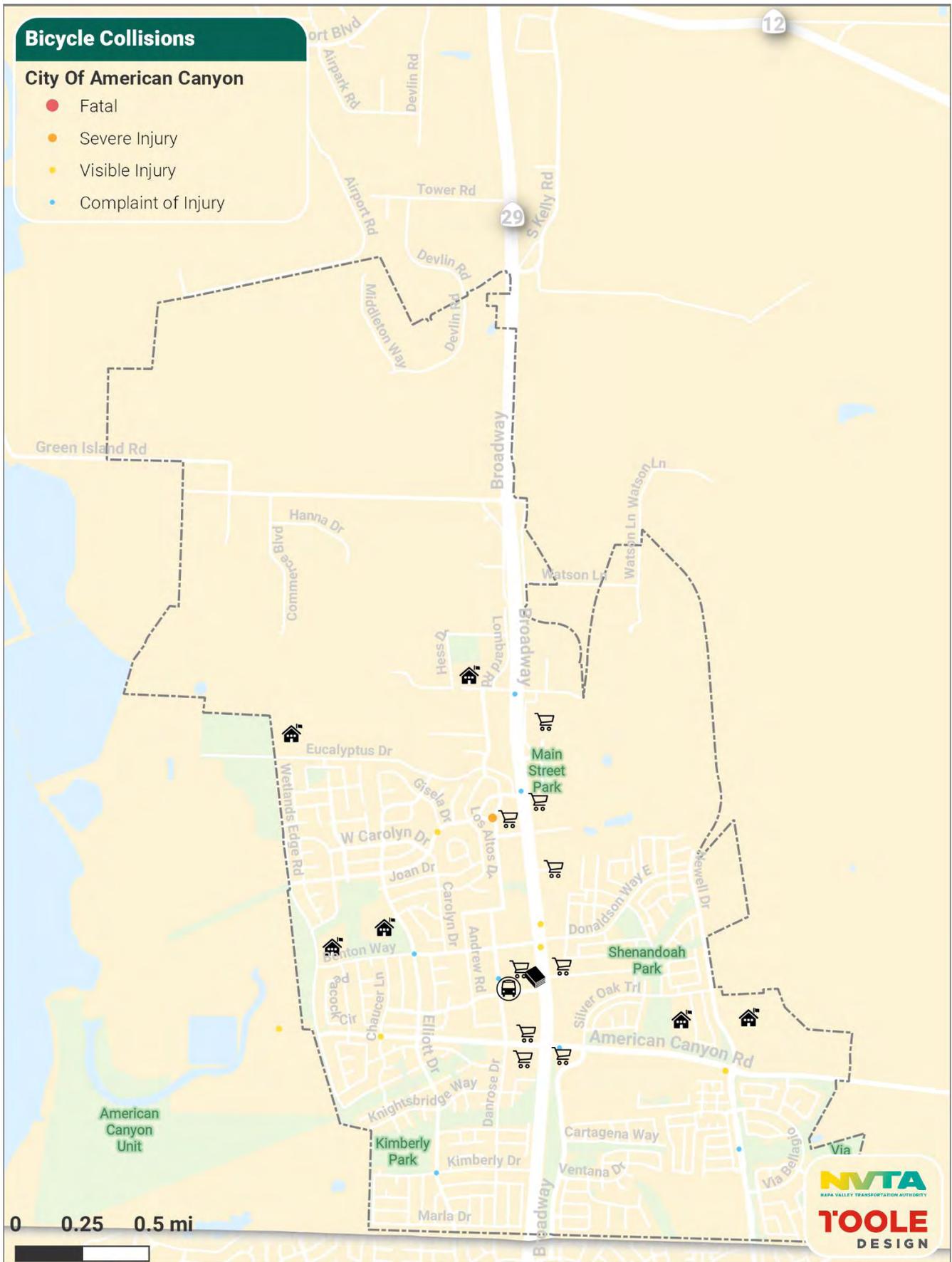


Figure AC.11. Bicycle Crash Distribution (2006-2013)

## *Community Input*

Residents of American Canyon were invited to be an active part of the planning process through in-person and online outreach activities hosted by the Napa Valley Transportation Authority (NVRTA). The community feedback directly informs the Plan's network and programmatic recommendations. For more information about outreach, see Chapter 2 of the 2019 Countywide Bicycle Plan.

From July to October 2017, residents were invited to share their site-specific comments on the existing network and potential improvements through an online, interactive WikiMap. Respondents were asked to provide feedback on:

- Barriers to biking
- Places/routes where I currently ride a bike
- Places/routes where I would like to ride

Six respondents contributed a total of ten comments within American Canyon. Highlights include:

- It is unsafe and uncomfortable to ride a bike in American Canyon due to the lack of comfortable bike facilities and challenging roadway crossings.
- SR 29 and American Canyon road were identified as barriers.
- Trails such as the Tuscan Oak Trail are too narrow for bicyclists to use; they should be widened or on-street facilities should be provided.

The location of WikiMap comments in American Canyon can be found in Appendix B.

In addition to the initial WikiMap, NVRTA also hosted an online map from June to July 2018, for residents to review the recommended bicycle network facilities. This map showed draft recommended bike facilities throughout the county and allowed users to agree or disagree that the recommendation was appropriate in that location. Over 50 respondents provided approximately 330 comments which were reviewed by staff in each jurisdiction for possible changes to the recommended network.

American Canyon was also represented through involvement in committees and through direct outreach to City staff by NVRTA throughout the development of this plan.

## SECTION 4: PROPOSED BICYCLE NETWORK

The main purpose of this plan is to identify a future bicycle network for American Canyon that is safe and connected. The proposed bicycle network map (see Figure AC.11) was developed based on fieldwork, an analysis of existing conditions, input from the community and City staff, in consideration of best practices in bicycle network planning, and facility guidance from Appendix A: Bicycle Facilities Toolkit.

The resulting network includes high-quality infrastructure in the form of shared-use paths, separated bike lanes, bike boulevards, and bike routes. These facilities connect to key community destinations and neighborhoods and close network gaps. The network also provides connections beyond the American Canyon city boundary into the unincorporated areas.

American Canyon’s proposed bicycle network is a 24.1-mile network, as detailed in Table AC.3. When implemented, the existing and proposed facilities will create a 37.2-mile network.

**Table AC.3. Proposed Bicycle Network**

Facility	Proposed Mileage	Existing Mileage	Total Future Mileage
Vine Trail (Class I)	2.8	2.4	5.2
Shared-Use Paths (Class I)	11.5	7.3	18.8
Bike Lanes (Class II)	6.5	1.6	8.1
Bike Boulevard (Class III)	1.6	-	1.6
Rural Bike Routes (Class III)	0.8	1.8	2.6
Separated Bike Lanes (Class IV)	0.9	-	0.9
<b>Total Network</b>	<b>24.1</b>	<b>13.1</b>	<b>37.2</b>

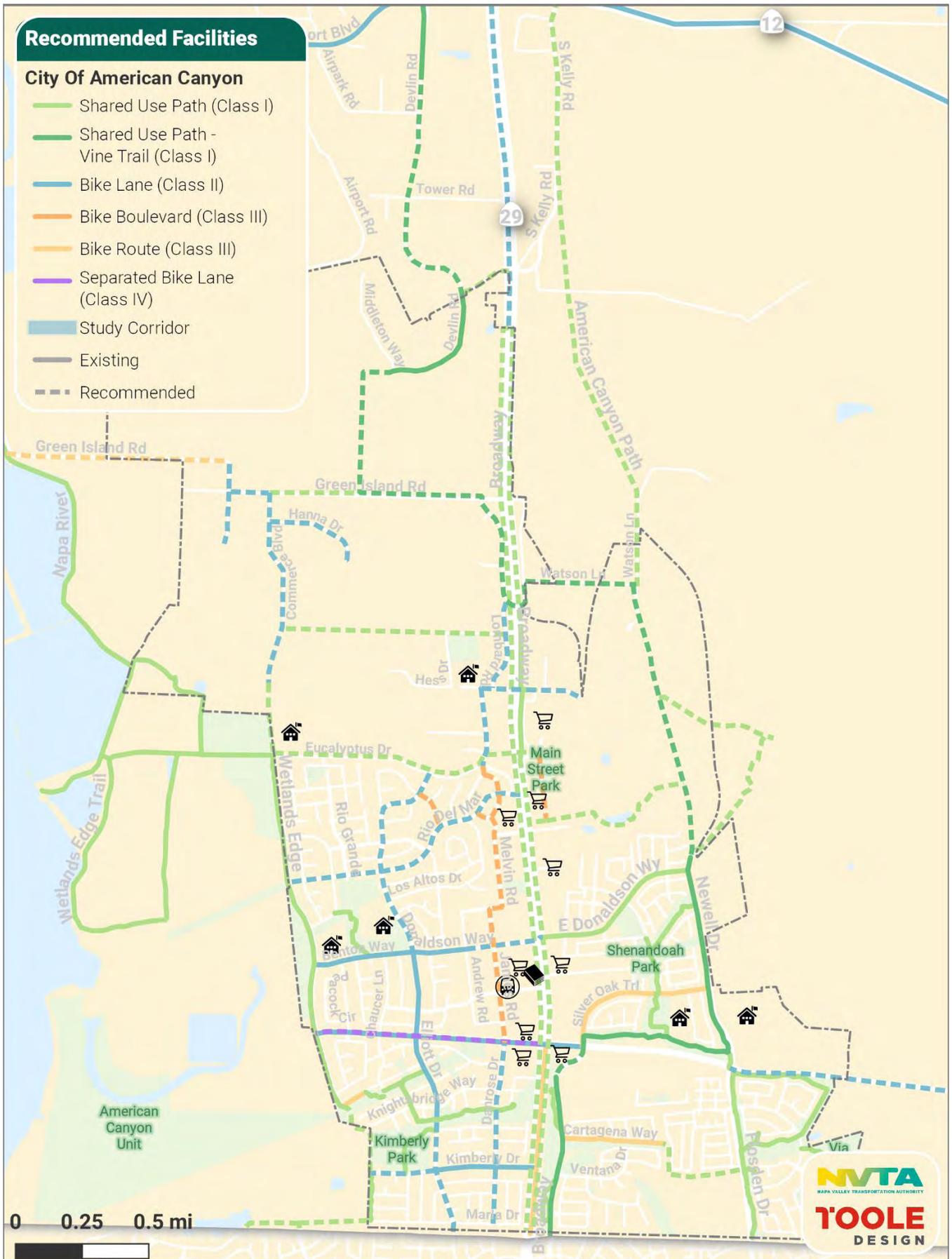


Figure AC.12. Proposed Bicycle Network

## SECTION 5: SUPPORT PROGRAMS AND POLICIES

City policies and support programs are key components of a welcoming, bicycle-friendly community. Generally, policies are set by the City government, while programs are led by or executed in partnership with external organizations or agencies such as advocacy organizations or school districts. Along with bike network investments, programs and policies will help American Canyon realize the Plan’s goals of connectivity, equity, safety, and education and encouragement.

American Canyon already has several programs related to bicycling which are described in Table AC.4. The existing and recommend programs create a full suite of efforts to promote and support bicycling throughout American Canyon.

**Table AC.4. Support Programs and Policies**

Support Program/Policy	Description	Source
<b>Existing</b>		
Safe Routes to School Program	Since 2010, this collaborative program, provided by the Napa County Office of Education in conjunction with the Napa Valley Bicycle Coalition, encourages students to walk and bike to school through education events, prizes, and safety projects.	Existing
Safety Education	The Napa County Bicycle Coalition organizes educational and promotional events to encourage safe bicycle riding in Napa County, such as bicycle safety rodeos and the annual BikeFest event in May. This can include educational programs for both children and adults.	Existing
<b>Recommended</b>		
Bicycle Parking, Shower, and Locker Facilities	Provide short- and long-term bicycle parking at key destinations, such as parks, schools, community facilities, transit stops, and shopping areas. Encourage employers to install showers and locker facilities for bicycle commuters.	2012 American Canyon Bicycle Plan
Capital Improvement Projects / Complete Streets Checklist	Create checklist for capital projects on and adjacent to streets (repaving, restriping, reconstruction) that ensures City staff review the infrastructure recommendations of this Plan at the time of project development	2019 Bicycle Plan
Dedicated Bicycle Staff	Identify a staff member who is responsible for bicycle planning and the implementation of bicycle facilities and dedicate a percentage of their time to these efforts.	2019 Bicycle Plan
Existing Bikeways Policy	Develop a policy which specifies that existing bikeways should not be removed, unless an improved bikeway is being installed.	2019 Bicycle Plan
Law Enforcement Activities	Coordinate with law enforcement agencies and improve officers’ understanding of bicycling issues, which will lead to better enforcement, heightened awareness of safety issues, and recognition of “teachable moments” for both bicyclists and motorists.	2012 American Canyon Bicycle Plan
	Provide bicycle-specific training for law enforcement personnel and establish a community policing agreement which engages members of the community, including agency engineering and planning staff, local elected officials, non-profit community advocates, schools, and others, to ensure the coordination of enforcement goals and strategies, and to develop a balanced	2019 Bicycle Plan

Support Program/Policy	Description	Source
	<p>approach to address traffic safety issues that includes education, engineering, and enforcement.</p> <p>Establish a bicycle diversion program for bicycle traffic offenders.</p> <p>Provide focused law enforcement operations at high collision locations.</p>	
Maintain Overgrown Vegetation	Continue to ensure citywide that landscapes at maturity do not interfere with safe sight distances for bicycle, pedestrian, or vehicular traffic; do not conflict with overhead lights, traffic controls, traffic signage, utility lines or poles, or walkway lights; and, do not block bicycle or pedestrian ways. Develop ordinance to encourage adjacent property owners to maintain landscaped areas with live and healthy plant materials, replace plant materials when necessary to maintain full function and aesthetics; to water, weed, prune, fertilize and keep sidewalks and planting strips litter free.	2016 Napa Countywide Pedestrian Plan
Site Plan Review Checklist	Create checklist for development review to ensure site plans include considerations for bicycle access and safety. Include items from MTC’s Routine Accommodation Checklist for projects in the public right-of-way to ensure routine application of the Complete Streets policy. MTC’s checklist can be found here: <a href="http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf">http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf</a>	2016 Napa Countywide Pedestrian Plan
Vision Zero Policy	Adopt a countywide Vision Zero policy and develop an action plan for implementing Vision Zero. Identify opportunities for funding for Vision Zero efforts, such as developing a Countywide database to inventory collision data and environmental factors, undertaking a comprehensive analysis to understand collision patterns, and facilitating an outreach process to identify community safety priorities and determine where to focus safety investments and improvements.	2019 Bicycle Plan
Wayfinding Program	Develop a regional wayfinding system that has a similar brand throughout Napa Valley and helps bicyclists navigate the transportation network with confidence and provide direction to their destinations; create a community identity; and build a sense of place. The City of American Canyon could adjust the brand to reflect local character while still maintaining signage elements for consistency including placement, frequency of signs, and content.	2019 Bicycle Plan
Bikeway Maintenance	Prioritize maintenance of roadways and removal of debris where bicycle facilities are present	2019 Bicycle Plan

## SECTION 6: IMPLEMENTATION PLAN

Because all communities, including American Canyon, have limited financial resources, it is not possible to implement all the recommended projects immediately. To focus American Canyon's resources, several characteristics of projects should be considered. These characteristics are discussed in relation to implementation phases below.

### *Immediate-Term*

#### **Overlap with Measure T Repaving Projects**

While the connectedness of a bicycle network is highly important, recommended projects should be implemented as opportunities arise for integration into existing projects. American Canyon's five-year paving plan funded by Measure T offers a great opportunity for quickly implementing several recommended bicycle facilities. American Canyon's Measure T plans have been compared to the proposed bicycle network, and those projects are noted in Table AC.5.

### *Short- and Medium-Term*

#### **Facility Characteristics**

All other planned street resurfacing and reconstruction projects should be reviewed against the recommended bike network. Another early step in the implementation of the bicycle plan should be to answer the following questions about each project:

- Does a facility consist only of striping and signage that can be added at any time?
- Does a facility necessitate further community dialog regarding reallocation of street space?
- Does a project need significant funding that must be obtained through a competitive process (i.e., grant)?
- Does a project necessitate acquiring additional right-of-way?
- Are there any environmental concerns about a project location?

These questions can help direct staff to understand which projects are more readily implementable.

#### **Proximity to Destinations**

Public input received over the course of this Plan process indicates greater interest in connecting to certain destinations including: schools, parks, trailheads, and community centers. The locations of these destinations, as well as other known bicycle traffic generators such as hotels with bike rental schemes should be considered when selecting projects for earlier implementation.

#### **Public Concerns**

Residents gave input through the WikiMap about areas of greater concern for bicyclists. These are documented in the summary above, and staff may wish to refer to these comments when considering which projects to implement first. Staff should also continue to collect and document resident concerns and priorities about bicycling and general traffic safety in American Canyon and bring those comments into discussions regarding implementation priorities.

## Network Connectivity

Staff should consider the benefits provided by a connected bicycle network. Research has shown that a connected low-stress network has the greatest impact on encouraging people to choose to bicycle. Projects that connect to existing facilities, especially ones that are known to be popular, may be prioritized. This should be balanced against the desire to provide bicycle facilities in and connecting to underserved communities in keeping with the equity goal of this Plan. Often, these areas have been historically underserved by infrastructure, and building new bike network projects here may not connect to existing facilities.

## Long-Term

Some projects, such as many shared-use paths (Class I), will necessarily require a more sustained effort to come to fruition. While it may take a longer time to implement these projects, jurisdictions should begin to consider the steps toward construction of these projects so they are prepared for grant applications or inserting funding into capital improvement plans and inclusion of shared-use path (Class I) projects under the 6.67% equivalent funds collective requirement.

## Connectivity Improvements from Phased Implementation

As stated, the planned bicycle facilities for American Canyon are intended to create the most low-stress network that conditions allow. Implementation of on-street facilities such as bike boulevards (Class III) and bike lanes (Class II) will significantly improve the connectivity of the bicycle network for riders of all ages and abilities. Focusing first on intersection treatments at locations where these facilities cross high-speed, high-volume streets without a traffic signal will most quickly improve connectivity.

While shared-use paths (Class I facilities) certainly provide a low-stress riding environment, their implementation requires more investment and often more planning than on-street facilities. Within American Canyon, the construction of shared-use paths on either side of Broadway will create significant connectivity improvements. These are understood to be a large, long-term capital investments, however, so implementation of on-street facilities in the meantime will provide great benefits to the city.

## Funding

Funding for the bicycle network projects can come from different sources. For example, the City of American Canyon could fund the improvements through dedicated funds from the City, by leveraging development-driven projects, or through grant opportunities. More information about available grant funds can be found in Chapter 4 of the 2019 Countywide Bicycle Plan.

Table AC.5. Project List for City of American Canyon

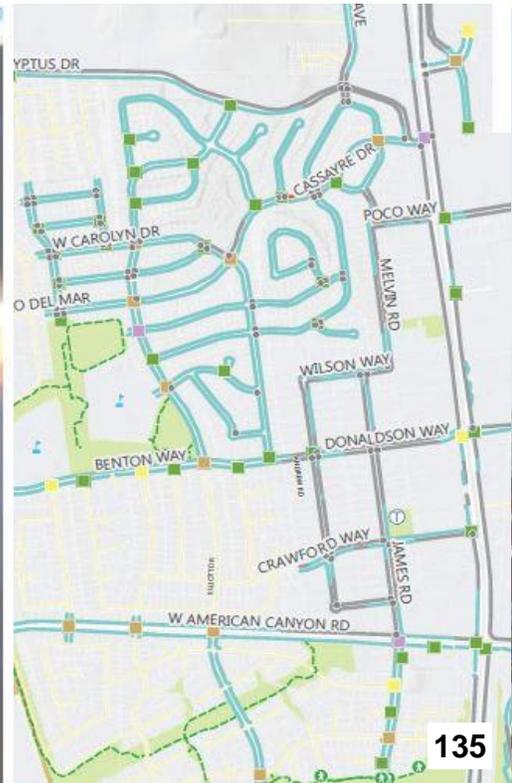
Project ID	Street/Trail Name	Begin	End	Facility Type	Length (Miles)
<b>Measure T Overlap Projects</b>					
<b><i>Bike Lane (Class II) Projects</i></b>					
740	Danrose Dr	Marla Dr	W American Canyon Rd	Bike Lane (Class II)	0.68
212	Donaldson Wy	Elliot Dr/Donaldson Wy	Eucalyptus Dr	Bike Lane (Class II)	0.81
803*	Elliot Dr	City Limit	Knightsbridge Wy	Bike Lane (Class II)	0.47
227	Kimberly Dr	Elliot Dr	Meadow Bay Dr	Bike Lane (Class II)	0.24
207	Theresa Ave	Napa Junction Rd	Eucalyptus Dr	Bike Lane (Class II)	0.30
<b><i>Bike Boulevard (Class III) Projects</i></b>					
831	Gisela Dr	Donaldson Wy	Rio Del Mar	Bike Boulevard (Class III)	0.15
221*	James Rd	Wilson Wy	American Canyon Rd	Bike Boulevard (Class III)	0.51
<b><i>Bike Route (Class III) Projects</i></b>					
732*	Green Island Rd	Bay Trail	Commerce Rd	Bike Route (Class III)	0.84
<b>All Other Projects</b>					
<b><i>Shared-Use Path (Class I) Projects</i></b>					
210	Bay Area Ridge Trail - Eucalyptus Dr	Wetlands Edge Rd	Main St	Shared-Use Path (Class I)	1.04
845	Bay Area Ridge Trail - S Napa Junction Rd	Main St	Vine Trail (Newell Dr extension)	Shared-Use Path (Class I)	0.62
228	Bay Trail (Kimberly Area Segment)	Kimberly Dr	Kensington Wy	Shared-Use Path (Class I)	0.32
225	Cartagena-Via Bellagio Connector Path	150' E of Entrada Circle	Flosden Rd	Shared-Use Path (Class I)	0.40
805	Commerce Blvd	Eucalyptus Dr	Clarke Ranch Park	Shared-Use Path (Class I)	0.27
735	Green Island Rd	Vine Trail	Commerce Blvd	Shared-Use Path (Class I)	0.33
204	Hess Rd	Commerce Rd	Lombard Rd	Shared-Use Path (Class I)	0.83
864	River Trail	Vine Trail	Newell Open Space	Shared-Use Path (Class I)	1.06
909	S Kelly Rd	SR 29	Devlin Rd	Shared-Use Path (Class I)	0.20
203	SR 29	North city limit at SR 29	American Canyon Rd	Shared-Use Path (Class I)	1.15
843	SR 29	North city limit at SR 29	American Canyon Rd	Shared-Use Path (Class I)	5.21
730	SR 29 connector	River to Ridge Trail	SR 29	Shared-Use Path (Class I)	0.06
879	Broadway	Veterans Park	American Canyon Rd	Shared-Use Path - Vine Trail (Class I)	0.17

Project ID	Street/Trail Name	Begin	End	Facility Type	Length (Miles)
899	Vine Trail (along Devlin Rd)	Middleton Way	Watson Ln	Shared-Use Path - Vine Trail (Class I)	1.62
868	Vine Trail (Newell Rd Extension)	Donaldson Way (Southern Intersection of proposed Vine and Ridge Trails)	Paoli Rd	Shared-Use Path - Vine Trail (Class I)	1.06
<b>Separated Bike Lane (Class IV) Project</b>					
222	American Canyon Rd	Wetlands Edge Rd	SR 29	Separated Bike Lane (Class IV)	0.85
<b>Bike Lane (Class II) Projects</b>					
223	American Canyon Rd	Newell Dr	I-80	Bike Lane (Class II)	0.42
736	Commerce Blvd	Clarke Ranch Park	Green Island Rd	Bike Lane (Class II)	0.74
209	Donaldson Wy	Andrew Rd	Newell Dr	Bike Lane (Class II)	0.30
733	Green Island Rd	Northern intersection of Green Island Rd and Mezzetta Ct	Vine Trail (Class I facility intersecting at Green Island Rd 300' W of RR tracks)	Bike Lane (Class II)	0.25
737	Hanna St	Commerce Blvd	terminus	Bike Lane (Class II)	0.37
205	Lombard Rd	proposed Vine Trail	Napa Junction Rd	Bike Lane (Class II)	0.34
734	Mezzetta Ct	Green Island Rd	end of street	Bike Lane (Class II)	0.20
729	Napa Junction Rd	Theresa Ave	future path	Bike Lane (Class II)	0.37
830	Rio Del Mar	Bay Trail, Near Wetlands Edge Rd	SR 29 (Broadway)	Bike Lane (Class II)	1.00
<b>Bike Boulevard (Class III) Projects</b>					
844	Main St	Eucalyptus Dr	Bay Area Ridge Trail (S Napa Junction Rd)	Bike Boulevard (Class III)	0.25
215	Cassayre Dr	Melvin Rd	Rio Del Mar	Bike Boulevard (Class III)	0.15
218	Los Altos Dr	Theresa Ave	Rio del Mar	Bike Boulevard (Class III)	0.10
216	Melvin Rd	James Rd	Cassayre Dr	Bike Boulevard (Class III)	0.35
220	Melvin Rd	James Rd	Rio Del Mar	Bike Boulevard (Class III)	0.05
217	Theresa Ave	Eucayptus Dr	Los Altos Dr	Bike Boulevard (Class III)	0.03

\* Projects denoted with an asterisk overlap with a jurisdiction-identified Measure T project, but they do not have the same extents: the proposed bicycle network project is either longer or shorter than the Measure T project.



# American Canyon Pedestrian Plan



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## ACKNOWLEDGEMENTS

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Consultants	 <p>The consultants section features three logos. At the top is a green square logo with a white stylized 'f' or 'W' shape. Below it is the 'WILTEC' logo in a bold, black, sans-serif font. At the bottom is the Rincon logo, which consists of a blue square with the word 'rincon' in white lowercase letters, followed by the text 'Rincon Consultants, Inc.' and 'Environmental Scientists Planners Engineers' in a smaller font.</p>

# Table of Contents

<b>CHAPTER 1. COUNTYWIDE INTRODUCTION</b> .....	<b>1</b>
<b>Plan Oversight, Guidance, and Public Involvement</b> .....	<b>3</b>
<b>Countywide Vision and Goals</b> .....	<b>3</b>
Vision Statement .....	3
Goals and Policies .....	3
<b>Countywide Walking Trends</b> .....	<b>5</b>
County Mode Split and Travel Patterns .....	8
Forecasted Pedestrian Demand .....	10
Collision Trends .....	11
Community Input .....	16
Individual Jurisdictions .....	18
<b>CHAPTER 2 CALISTOGA PLAN</b> .....	<b>1</b>
Existing Pedestrian Policies and Programs .....	1
Existing Pedestrian Infrastructure .....	8
Activity Levels .....	10
Collision Analysis .....	12
<b>Public and Stakeholder Input</b> .....	<b>15</b>
Countywide Outreach .....	15
Calistoga-Specific Focus Groups .....	18
<b>Opportunity Areas</b> .....	<b>18</b>
Ped INDEX .....	18
<b>Priority Project and Implementation Plan</b> .....	<b>21</b>
Walking Audits .....	21
Project List and Map .....	21
Priority Projects .....	23
Supporting Programs and Policies .....	27
<b>Next Steps</b> .....	<b>30</b>
Funding Sources .....	30
Countywide Performance Metrics and Evaluation .....	32
<b>Calistoga Appendix</b> .....	<b>33</b>
<b>CHAPTER 3 ST. HELENA PLAN</b> .....	<b>1</b>
<b>Pedestrian Setting</b> .....	<b>1</b>
Existing Policies and Programs .....	2
Existing Pedestrian Infrastructure .....	6

Activity Levels.....	8
Collision Analysis .....	12
<b>Public and Stakeholder Input .....</b>	<b>15</b>
Countywide Outreach .....	15
St Helena-Specific Focus Groups .....	19
Perceived Barriers .....	19
<b>Opportunity Areas .....</b>	<b>21</b>
Ped INDEX.....	21
<b>Priority Project and Implementation Plan .....</b>	<b>24</b>
Walking Audits .....	24
Project List and Map .....	24
Priority Projects.....	26
Supporting Programs and Policies.....	30
<b>Next Steps.....</b>	<b>33</b>
Funding Sources .....	33
Countywide Performance Metrics and Evaluation .....	35
<b>St. Helena Appendix.....</b>	<b>36</b>
<b>CHAPTER 4 YOUNTVILLE PLAN.....</b>	<b>1</b>
<b>Pedestrian Setting.....</b>	<b>1</b>
Existing Policies and Programs .....	2
Existing Pedestrian Infrastructure.....	7
Activity Levels.....	9
Collision Analysis .....	10
<b>Public and Stakeholder Input .....</b>	<b>13</b>
Countywide Outreach .....	13
Yountville-Specific Focus Groups .....	17
Perceived Barriers .....	17
<b>Opportunity Areas .....</b>	<b>19</b>
Ped INDEX.....	19
<b>Priority Projects and Implementation Plan.....</b>	<b>22</b>
Walking Audits .....	22
Project List and Map .....	22
Priority Projects.....	24
Supporting Programs and Policies.....	28
<b>Next Steps.....</b>	<b>31</b>
Funding Sources .....	31
Countywide Performance Metrics and Evaluation .....	33
<b>Yountville Appendix.....</b>	<b>34</b>

<b>CHAPTER 5 NAPA PLAN</b> .....	<b>1</b>
<b>Pedestrian Setting</b> .....	<b>1</b>
Existing Policies and Programs .....	2
Existing Pedestrian Infrastructure .....	7
Napa Inventory .....	7
Activity Levels .....	9
Collision Analysis .....	20
<b>Public and Stakeholder Input</b> .....	<b>23</b>
Countywide Outreach .....	23
Napa-Specific Focus Groups .....	27
Perceived barriers .....	27
<b>Opportunity Areas</b> .....	<b>29</b>
Ped INDEX .....	29
<b>Project Development and Evaluation</b> .....	<b>35</b>
Walking Audits .....	35
Project List and Map .....	35
Project Benefits .....	38
Supporting Programs and Policies .....	43
<b>Next Steps</b> .....	<b>45</b>
Funding Sources .....	45
Countywide Performance Metrics and Evaluation .....	47
<b>Napa Appendix</b> .....	<b>48</b>
 <b>CHAPTER 6 AMERICAN CANYON PLAN</b> .....	 <b>1</b>
<b>Pedestrian Setting</b> .....	<b>1</b>
Existing Policies and Programs .....	2
Existing Pedestrian Infrastructure .....	7
Activity Levels .....	9
Collision Analysis .....	11
<b>Public and Stakeholder Input</b> .....	<b>14</b>
Countywide Outreach .....	14
American Canyon-Specific Focus Groups .....	18
Perceived Barriers .....	18
<b>Opportunity Areas</b> .....	<b>20</b>
Ped INDEX .....	20
2016 ADA Transition Plan Update .....	21
<b>Priority Projects and Implementation Plan</b> .....	<b>23</b>
Walking Audits .....	23
Project List and Map .....	23

Priority Projects.....	25
Supporting Programs and Policies.....	29
<b>Next Steps.....</b>	<b>31</b>
Funding Sources .....	31
Countywide Performance Metrics and Evaluation .....	33
<b>American Canyon Appendix .....</b>	<b>34</b>
<b>CHAPTER 7 UNINCORPORATED PLAN .....</b>	<b>1</b>
<b>Pedestrian Setting .....</b>	<b>1</b>
Existing Policies and Programs .....	2
Existing Pedestrian Infrastructure .....	7
Activity Levels.....	10
Collision Analysis .....	10
<b>Public and Stakeholder Input .....</b>	<b>13</b>
Countywide Outreach .....	13
Unincorporated County-Specific Focus Groups .....	17
Potential Barriers .....	17
<b>Opportunity Areas .....</b>	<b>19</b>
Ped INDEX.....	19
<b>Priority Projects and Implementation Plan.....</b>	<b>22</b>
Walking Audits .....	22
Project List and Map .....	22
Priority Projects.....	24
Supporting Programs and Policies.....	28
<b>Next Steps.....</b>	<b>30</b>
Funding Sources .....	30
Countywide Performance Metrics and Evaluation .....	32
<b>Unincorporated County Appendix.....</b>	<b>33</b>
<b>CHAPTER 8 COUNTYWIDE IMPLEMENTATION .....</b>	<b>19</b>
<b>Support Programs .....</b>	<b>19</b>
Safe Routes To School (SRTS) .....	20
Countywide Count Evaluation Program .....	22
Vision Zero.....	25
<b>Performance Goals.....</b>	<b>26</b>
<b>Plan Consistency .....</b>	<b>28</b>
Federal Policies .....	28
State Policies .....	29
Regional and County Policies and Connections .....	30

Local Plans .....	33
<b>APPENDIX A – PUBLIC WORKSHOP MATERIALS .....</b>	<b>1</b>
January 22, 2015 - NVTA .....	1
January 27, 2015 – Yountville Town Hall.....	4
February 4, 2015 – American Canyon City Hall.....	6
<b>APPENDIX B – PED INDEX METHODOLOGY .....</b>	<b>1</b>
<b>APPENDIX C – GRANT FUNDING SOURCE.....</b>	<b>1</b>
<b>APPENDIX D – BEST PRACTICES TOOLKIT.....</b>	<b>1</b>
Creating a Walkable Network .....	1
The Pedestrian Realm .....	2
Accessibility .....	5
Additional Treatment Guidelines .....	7
<b>Crosswalk Guidelines .....</b>	<b>17</b>
Introduction .....	17
<b>Crosswalk Fundamentals.....</b>	<b>18</b>
Types of Crosswalks .....	18
Where Is Crossing the Street Legal?.....	18
Why Mark Crosswalks? .....	19
Steps to Identify Candidate Locations for Marked Crosswalks at Uncontrolled Locations.....	20
<b>Uncontrolled Crossing Enhancement Toolbox .....</b>	<b>23</b>
Crosswalk Safety Research.....	23
<b>Treatment Selection.....</b>	<b>26</b>
Treatment Options.....	27
<b>Controlled Crosswalk Treatment Toolbox .....</b>	<b>43</b>
Universal Considerations .....	43
Signalized Crossing Enhancements .....	44
Flow Chart Footnotes.....	49

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**CHAPTER 1**

# Countywide Introduction

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## Chapter 1.

# Countywide Introduction

The *Napa Countywide Pedestrian Plan* is intended to guide and inform pedestrian infrastructure, policies, programs, and development standards to make walking in Napa County safe, comfortable, convenient and enjoyable for all pedestrians. It strives to improve accessibility for the disabled but does not intend to replace existing ADA Transition Plans.

The *Napa Countywide Pedestrian Plan* is being developed to complement existing planning documents for all Napa County jurisdictions, and ultimately be combined with the *Countywide Bicycle Plan* (NVTA, January 2012) to create a *Countywide Active Transportation Plan* that will allow and position the County to effectively compete for project funding. This plan follows the 2015 Caltrans Active Transportation Program (ATP) Guidelines, which outline statewide requirements for what should be included in active transportation plans. The specific requirements from the 2015 ATP Guidelines are listed below in **Table 1** along with the relevant location in this plan.

**TABLE 1: 2015 CALTRANS ACTIVE TRANSPORTATION PROGRAM GUIDELINES - REQUIRED PLAN COMPONENTS**

Active Transportation Plan Requirement	Location in this Plan
The estimated number of existing bicycle trips and pedestrian trips in the plan area, both in absolute numbers and as a percentage of all trips, and the estimated increase in the number of bicycle trips and pedestrian trips resulting from implementation of the plan	Chapter 1, <i>Countywide Walking Trends</i>
The number and location of collisions, serious injuries, and fatalities suffered by bicyclists and pedestrians in the plan area, both in absolute numbers and as a percentage of all collisions and injuries, and a goal for collision, serious injury, and fatality reduction after implementation of the plan	Chapter 1, <i>Countywide Walking Trends</i>
A map and description of existing and proposed land use and settlement patterns which must include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings, major employment centers, and other destinations.	Chapters 2-7*, <i>Pedestrian Setting</i>
A map and description of existing and proposed pedestrian facilities, including those at major transit hubs and those that serve public and private schools and, if appropriate, a description of how the five E's (Education, Encouragement, Enforcement, Engineering, and Evaluation) will be used to increase rates of walking to school. Major transit hubs must include, but are not limited to, rail and transit terminals, and ferry docks and landings.	Chapters 2-7*, <i>Priority Projects and Implementation Plan</i> Chapter 8, <i>Support Programs</i>
A description of proposed signage providing wayfinding along bicycle and pedestrian networks to designated destinations	Appendix D
A description of the policies and procedures for maintaining existing and proposed bicycle and pedestrian facilities, including, but not limited to, the maintenance of smooth pavement, ADA level surfaces, freedom from encroaching vegetation, maintenance of traffic control devices including striping and other pavement markings, and lighting.	Chapters 2-7*, <i>Priority Projects and Implementation Plan</i>
A description of bicycle and pedestrian safety, education, and encouragement programs conducted in the area included within the plan, efforts by the law enforcement agency having primary traffic law enforcement responsibility in the area to enforce provisions of the law impacting bicycle and pedestrian safety, and the resulting effect on collisions involving bicyclists and pedestrians.	Chapters 2-7*, <i>Pedestrian Setting</i>
A description of the extent of community involvement in development of the plan, including disadvantaged and underserved communities	Chapters 2-7*, <i>Public and Stakeholder Input</i>
A description of how the active transportation plan has been coordinated with neighboring jurisdictions, including school districts within the plan area, and is consistent with other local or regional transportation, air quality, or energy conservation plans, including, but not limited to, general plans and a Sustainable Community Strategy in a Regional Transportation Plan.	Chapter 8, <i>Plan Consistency</i>
A description of the projects and programs proposed in the plan and a listing of their priorities for implementation, including the methodology for project prioritization and a proposed timeline for implementation.	Chapters 2-7*, <i>Priority Projects and Implementation Plan</i>
A description of past expenditures for bicycle and pedestrian facilities and programs, and future financial needs for projects and programs that improve safety and convenience for bicyclists and pedestrians in the plan area. Include anticipated revenue sources and potential grant funding for bicycle and pedestrian uses.	Chapters 2-7*, <i>Next Steps</i>
A description of steps necessary to implement the plan and the reporting process that will be used to keep the adopting agency and community informed of the progress being made in implementing the plan.	Chapter 8, <i>Performance Goals</i>
A resolution showing adoption of the plan by the city, county or district. If the active transportation plan was prepared by a county transportation commission, regional transportation planning agency, MPO, school district or transit district, the plan should indicate the support via resolution of the city(s) or county(s) in which the proposed facilities would be located	Chapters 2-7*, <i>Appendix E</i>

\*Chapters 2-7 are individual jurisdiction plans; this information can be found in each jurisdiction plan under the noted section.

## Plan Oversight, Guidance, and Public Involvement

Several groups were involved in guiding the development of the Plan. Those groups and their role in the planning process are listed below:

- Napa Valley Transportation Authority (NVTA) – lead agency
- NVTA Active Transportation Advisory Committee (ATAC) / NVTA Technical Advisory Committee (TAC) - provide guidance and recommendations at key milestones to discuss project progress and topics of countywide significance such as plan vision, prioritization criteria and overall consistency
- Individual Jurisdiction Focus Groups – steering committees consisting of local staff and stakeholders to discuss existing conditions and practices; identify key issues and opportunities; provide input on priority study areas; develop improvement project concepts for focus areas; determine prioritization and implementation planning for project lists; and propose key program and policy recommendations
- Public/Stakeholders – provide input on the locations of key issues and opportunities in each jurisdiction, the vision and goals of the plan, at workshops and via online mapping; participate as key stakeholders in walking audits and the review of improvement concepts for focus areas

## Countywide Vision and Goals

The countywide vision and goals for this plan are intended to guide pedestrian planning in the region. Input was received from the Jurisdiction Focus Groups and the community during the public workshops and incorporated into the following vision and goals.

### Vision Statement

To provide a pedestrian network that is well connected, safe, and enjoyable for Napa County residents and visitors of all levels of mobility. This plan aims to increase the number of pedestrian trips countywide and to set the groundwork for a shift in travel mode choice such that non-motorized options are widely available, accessible, and convenient. Through implementation of this plan and future updates, all Napa County residents, regardless of age or income level, should have easy walking access to their community and the services and amenities that it offers.

### Goals and Policies

The following goals and policies support the overall vision for the plan:

*Goal 1: Provide a connected network of pedestrian sidewalks, trails, and pathways in the County and its jurisdictions that are safe and accessible to a variety of users and that foster community interactions*

Policy 1A: Protect the character and context of the County and its jurisdictions

Policy 1B: Prioritize safe routes to schools, safe routes to transit, and safe routes for seniors within the County

Policy 1C: Acknowledge the central role that the Vine Trail plays in active transportation infrastructure and prioritize connections between the trail and key destinations

Policy 1D: Work to reduce the rate of pedestrian collisions

Policy 1E: Connect key pedestrian desire lines via accessible sidewalks and marked crosswalks, focusing on downtown areas, transit stops, schools, senior housing and destinations, and tourist destinations and lodging

*Goal 2: Encourage a multimodal transportation system*

Policy 2A: Adhere to the current design standards in this plan as well as local design standards and other national and state manuals when designing new or retrofitted streets and communities

Policy 2B: Investigate the use of performance measures such as multi-modal level of service or built environment factors to facilitate complete streets implementation

Policy 2C: Prioritize infrastructure projects that will increase the walk mode share, while also taking advantage of all available funding opportunities to construct pedestrian infrastructure, including private development with an appropriate nexus

Policy 2D: Investigate creative parking measures such as shared parking, parking maximums, and strategic parking locations to encourage a “park once” environment in commercial districts

Policy 2E: Review new development proposals to ensure pedestrian access and circulation is maintained or improved, including during construction phases

*Goal 3: Obtain funding for pedestrian projects*

Policy 3A: Continue to allocate Capital Improvement Plan (CIP) funding to pedestrian projects

Policy 3B: Pursue grant funding related to pedestrian projects

Policy 3C: Identify new funding sources and partnership opportunities, such as those focusing on public health and sustainability

*Goal 4: Encourage and educate residents about walking and enforce safe interactions between pedestrians and motorists*

Policy 4A: Increase public awareness of pedestrian facilities, amenities, and safety

Policy 4B: Pursue recognition such as Walk-Friendly Community status

Policy 4C: Implement ongoing pedestrian safety enforcement programs and campaigns

Policy 4D: Partner with local health agencies to encourage more activity among youth through the built environment to target childhood obesity

Policy 4E: Collaborate with local businesses to enhance wayfinding and streetscape amenities



Calistoga: Washington Street

## Countywide Walking Trends

Napa County is a scenic and historic Bay Area destination that thrives on year-round visitors and its grape vineyards. Located in the North Bay region with the majority of development along SR 29, Napa County is a predominantly rural community with regional access provided by the surrounding highway network. The County is bordered by Sonoma County to the west, Solano and Yolo Counties to the east, and Lake County to the north, as shown in Exhibit 1. The County includes the cities of American Canyon, Calistoga, Napa, and St. Helena; the Town of Yountville; and unincorporated areas.

With historic commercial districts and vital community assets such as open space and trails, the five incorporated jurisdictions accommodate pedestrians in a variety of ways. The various downtown areas offer corridors of shopping and dining destinations that are contributors to the pedestrian environment in the County, and many provide a system of sidewalks and plazas that make the downtown districts pleasant and interesting places to

walk. Residential neighborhoods in the County are typically pleasant places to walk, with some roadways having sidewalks and others having a more rural character.

The unincorporated areas of the County have a predominantly rural character and development is sporadic consisting mostly of residential areas, a few village centers and some institutional uses. Neighborhoods in the unincorporated County include Angwin, Berryessa Estates, Berryessa Highlands, Big Ranch Road, Coombsville, Deer Park, Lake Berryessa (Moskowite Corners, Pope Creek, and Spanish Flat), Silverado, and the South County Industrial Areas. These communities have limited pedestrian infrastructure; neighborhood streets typically do not have sidewalks, and few intersections currently have marked crosswalks.



Angwin: Howell Mountain Road



## County Mode Split and Travel Patterns

A common term used in describing demand for bicycle and pedestrian facilities is “mode split”. Mode split refers to the form of transportation a person chooses to take, such as walking, bicycling, public transit, or driving. **Table 2** presents the California Household Travel Survey (CHTS, 2012) data on the percentage mode split for all person-trips in Napa County.

TABLE 2: NAPA COUNTY DAILY MODE SPLIT	
Mode	All Trips (2012) <sup>1</sup>
Auto	306,598 (88%)
Pedestrian	62,091 (9%)
Bicycle	1,234 (1%)
Transit	2,575 (1%)
Other <sup>2</sup>	2,394 (1%)

1. Percent mode share for all person-trips in Napa County from the California Household Travel Survey (2012).

2. Includes motorcycle and air travel.

Source: Fehr & Peers, 2015.

Walking is a common mode of transportation within the County’s developed communities. The incorporated regions of Napa County have history dating back to the 1800s, and their compact downtown business districts reflect this historic character, creating an inviting pedestrian environment. Neighborhoods located close to the downtown areas allow residents to easily travel on foot between the commercial and residential districts in the county’s incorporated regions. The unincorporated regions within Napa County, comprising the majority of its land area, are of a rural density and character. These regions offer fewer opportunities for pedestrian travel between destinations.

The Countywide Transportation Plan (CTP), Vision 2040, has a goal of shifting travel from single-occupancy vehicles to transit, walking, and bicycling, increasing mode share of all three by 10% by 2035. This plan proposes comfortable and accessible pedestrian improvements to attract new walking trips and increase the walking mode share to meet the goals of the CTP.

Understanding the mode of travel people choose and trip purpose can help jurisdictions develop effective and targeted programs to better serve residents and employees.

Trips of a distance less than one-half mile are typically considered viable for conversion to a walk trip, as it takes about 10 minutes to walk this distance. In Napa County, most commute trips are farther than this threshold, suggesting that a focus on non-commute trips (trips to school, for shopping, or for recreation, as well as visitor trips within commercial areas and hotel zones) will be important to support mode shift goals. Based on the 2010-2012 California Household Travel Survey, 17% of daily trips in the County were one-half mile or less in distance.

Employees

Based on the California Household Travel Survey, about 70,300 workers are employed within Napa County. This total is comprised of 55,500 Napa County residents, and 14,800 workers who commute from outside Napa County. The average commute distance for residents of Napa County is 9.6 miles, and the typical commute distance for employees in Napa County is 10.4 miles. As shown in **Table 3**, the Napa County residents’ commute mode share for walking is 4%, as compared to 9% walk mode share for all person trips.

TABLE 3: NAPA COUNTY RESIDENTS’ JOURNEY TO WORK		
Mode	Employed Napa County Residents	
	Total Employees	Percent of Total
Drove Alone	49,355	76.0%
Carpool	7,591	11.7%
Public Transportation	630	1.0%
Walked	2,785	4.3%
Bicycle	551	0.8%
Taxicab, motorcycle, other	426	0.7%
Worked At Home	3,538	5.5%

Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey

Visitors

Visit Napa Valley conducted a year-long visitor profile study in 2012 to gather data on lodging guests, day-trip visitors, and visiting friends and relatives (VFRs) staying overnight in private homes. The research found that an estimated 2.9 million visitors came to Napa Valley in 2012 with the largest percentage (66%) being day-trip visitors. As shown in **Table 4**, about 21% of the visitors that responded to the 2012 survey reported traveling within the Napa Valley area on foot during their stay. This suggests pedestrian improvements focused on tourist destinations and safety education messages targeted for tourists are important considerations in the County.

**TABLE 4: VISITOR TRANSPORTATION PRIMARY MODE USED WITHIN NAPA VALLEY**

Mode	Percent of All Napa Valley Visitors
Personal automobile	58.9%
Rental car	37.7%
Walk	20.9%
Limousine	4.8%
Bicycle	4.3%
Taxi	4.3%
Hotel Shuttle or courtesy vehicle	2.0%
Bus line	1.0%

Source: Visit Napa Valley, 2012 Napa Valley Visitor Profile

### Forecasted Pedestrian Demand

Based on the Metropolitan Transportation Commission (MTC) *Plan Bay Area*, the region plans to increase its bicycle, pedestrian, and transit mode shares by a total of 10% by 2040. This growth in alternative modes will be the result of bicycle, pedestrian, and transit infrastructure improvements and programs in the coming decades. NVTA forecasts that alternative mode shares will grow by this same percent by 2040, and that this growth will be equally split among the three modes, as a result of implementation of project and program recommendations in this plan, the Napa County Bicycle Plan, and planned transit improvements.

To capture work, tourism, recreational, and shopping trips within Napa County, this estimate solely evaluates trips with an origin and destination point within Napa County. Using a baseline of 2012 (from the 2010-2012 California Household Travel Survey), there are 54,885 daily walking trips in Napa County, 12.2% of all intra-county trips. This mode share is expected to increase to 15.5% in 2040 (**Table 5**).

**TABLE 5: DAILY TRIPS WITH ORIGINS AND DESTINATIONS IN NAPA COUNTY**

Year	2012		2040	
Population	136,644 <sup>1</sup>		163,609 <sup>2</sup>	
Mode	Daily Trips <sup>3</sup>	Mode Share	Daily Trips	Mode Share <sup>4</sup>
Drive Alone	216,713	48.0%	229,464	42.5%
Drive Shared	168,114	37.2%	178,005	32.9%
Transit	2,953	0.7%	21,551	4.0%
Walk	54,885	12.2%	83,731	15.5%
Bike	3,323	0.7%	21,993	4.1%
Other	5,376	1.2%	5,693	1.1%
Total	451,365	100%	540,437	100%

1. Source: 2008-2012 American Community Survey
2. Source: Vision 2040, Moving Napa Forward (2015)
3. Source: California Household Travel Survey (2010-2012)
4. Assumes a 3.3% increase in walk, bicycle, and transit mode shares. Drive alone, drive shared, and other trips are decreased by a total of 10%, each reduced proportional to 2012 mode share.

The population of Napa County is expected to increase by 27,000 people from 2012 to 2040. Based on an increase in both population and mode share, daily pedestrian trips in the County are forecast to grow to 83,731, a 53% increase.

### Collision Trends

Collision data was accessed from the California Highway Patrol Statewide Integrate Traffic Records System (SWITRS). This data represents all reported pedestrian-vehicle collisions occurring in Napa County during the ten-year period from January 2003 to December 2012. **Table 6** summarizes the collision data by year and severity of collision. Fourteen fatalities were reported during the ten-year period. Nearly all of the reported collisions (96 percent) resulted in some form of injury.

TABLE 6: NAPA COUNTY PEDESTRIAN-VEHICLE COLLISION SUMMARY (2003 – 2012)

Year	Pedestrian Injuries	Proportion of All County Injuries <sup>1</sup>	Pedestrian Fatalities	Proportion of All County Fatalities <sup>1</sup>	Total Pedestrian Collisions	Proportion of All County Collisions <sup>2</sup>
2003	37	2.6%	1	3.6%	1,466	2.6%
2004	32	2.3%	2	8.0%	1,398	2.4%
2005	25	1.9%	2	8.3%	1,312	2.1%
2006	34	2.6%	1	6.7%	1,340	2.6%
2007	24	2.2%	1	6.7%	1,100	2.3%
2008	34	3.1%	2	11.1%	1,118	3.2%
2009	40	4.2%	2	14.3%	948	4.4%
2010	28	3.2%	2	16.7%	894	3.4%
2011	25	2.8%	1	12.5%	893	2.9%
2012	23	2.4%	0	0.0%	949	2.4%
Total	302	2.7%	14	8.4%	11,418	2.8%

Source: SWITRS, TIMS

<sup>1</sup> “All county injuries” and “all county fatalities” describe pedestrian injury and fatal collisions, respectively, as a percentage of all reported injury and fatal traffic collisions, respectively and regardless of mode, in Napa County during the study period.

<sup>2</sup> Traffic collision total does not include collisions that did not result in injuries (e.g. “property damage only” collisions).

Minor collisions that involve pedestrians, whether with vehicles or bicycles, are generally underreported <sup>1</sup>. Additionally, collisions that occur on off-street paths and trails are not included in the SWITRS data.

### Demographics

Children and seniors are two of the most vulnerable populations in the context of pedestrian-involved collisions. As shown in Figure 1 and Figure 2 below, pedestrian-involved collisions including children are the most common within the County and in American Canyon. Yountville has the highest percentage of collisions involving seniors. Targeting safe routes to school and for seniors, respectively, may be of particular importance in these jurisdictions.

<sup>1</sup> Sciortino, S., Vassar, M., Radetsky, M. and M. Knudson, “San Francisco Pedestrian Injury Surveillance: Mapping, Underreporting, and Injury Severity in Police and Hospital Records,” *Accident Analysis and Prevention*, Volume 37, Issue 6, November 2005, Pages 1102-1113

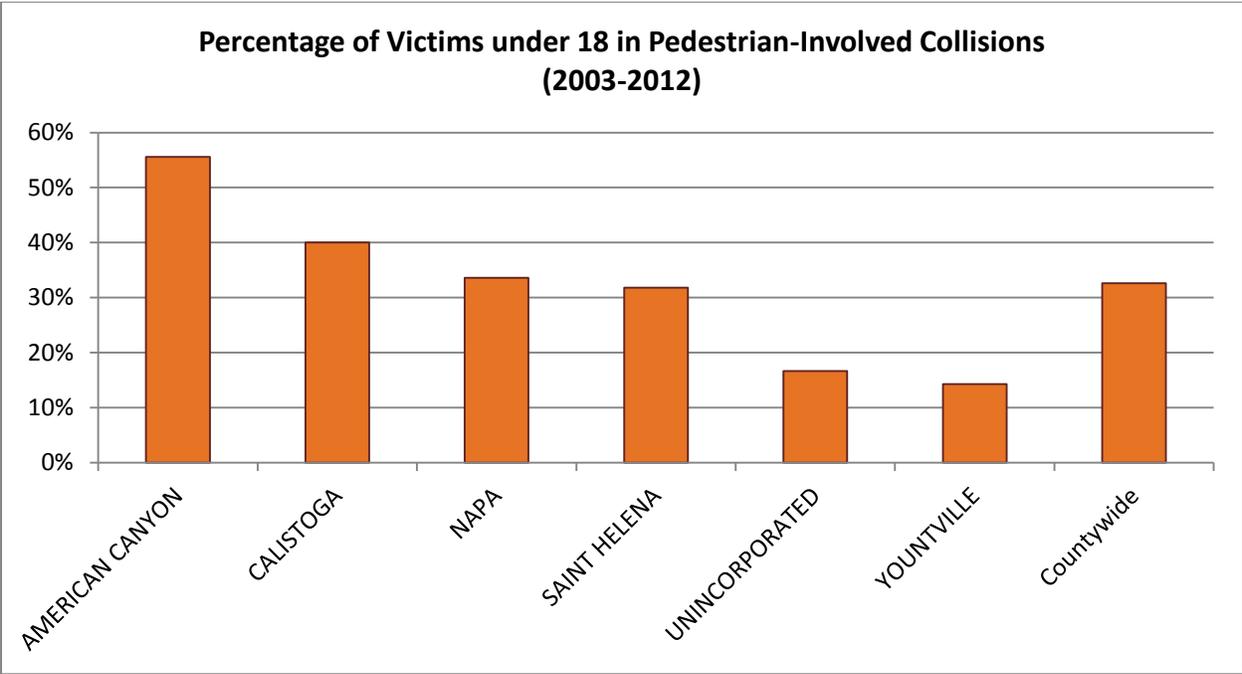


Figure 1 Countywide Child-Involved Pedestrian Collisions

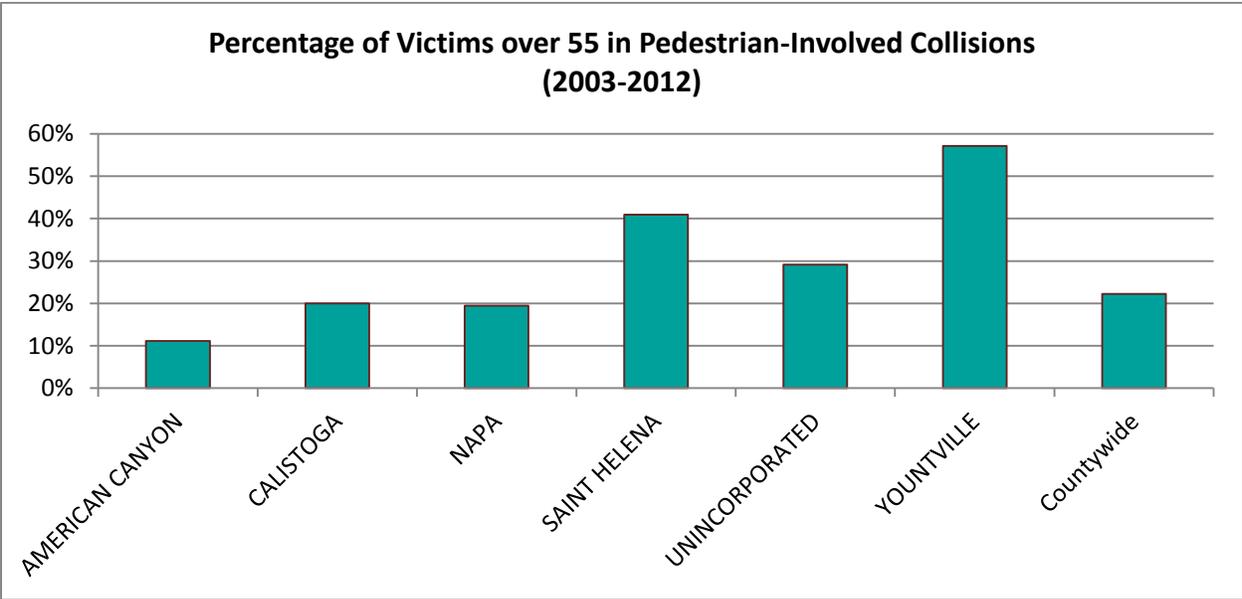


Figure 2 Countywide Senior-Involved Pedestrian Collisions

Daily and Seasonal Trends

Collisions in the County peak Thursday through Saturday, at the same time that tourism levels are high, as shown in Figure 3. Similarly, collisions are higher in the Fall, during Crush season. The holiday season and perhaps also rainier/darker days in December and January contribute to the trend, as shown in Figure 4.

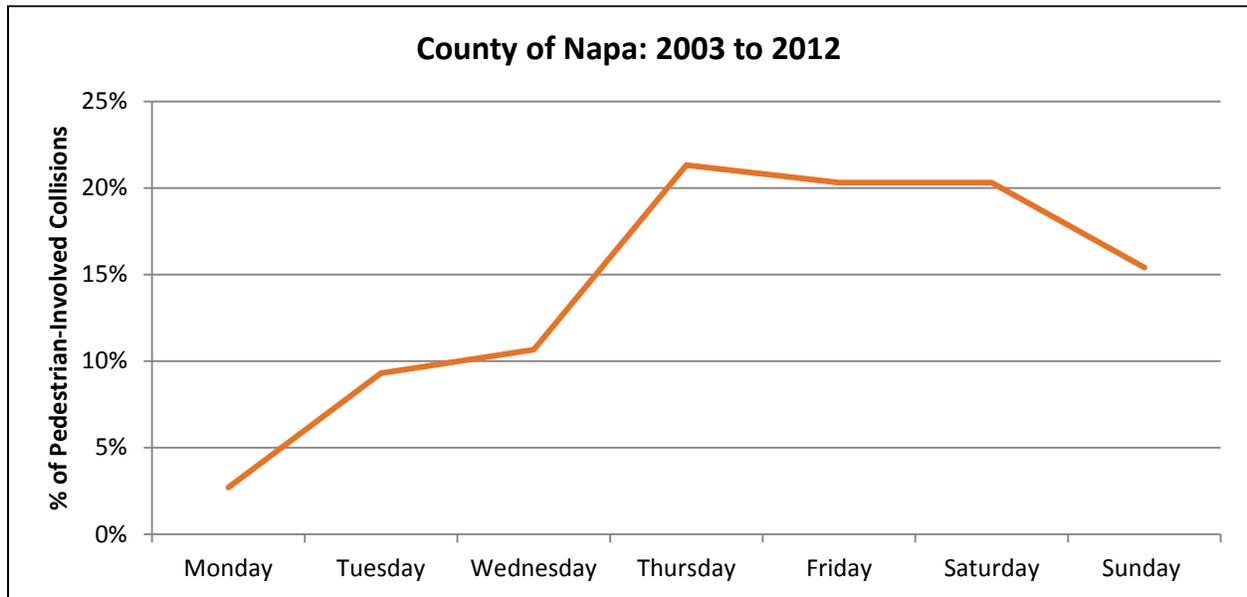


Figure 3 Daily Trends for Pedestrian-Involved Collisions

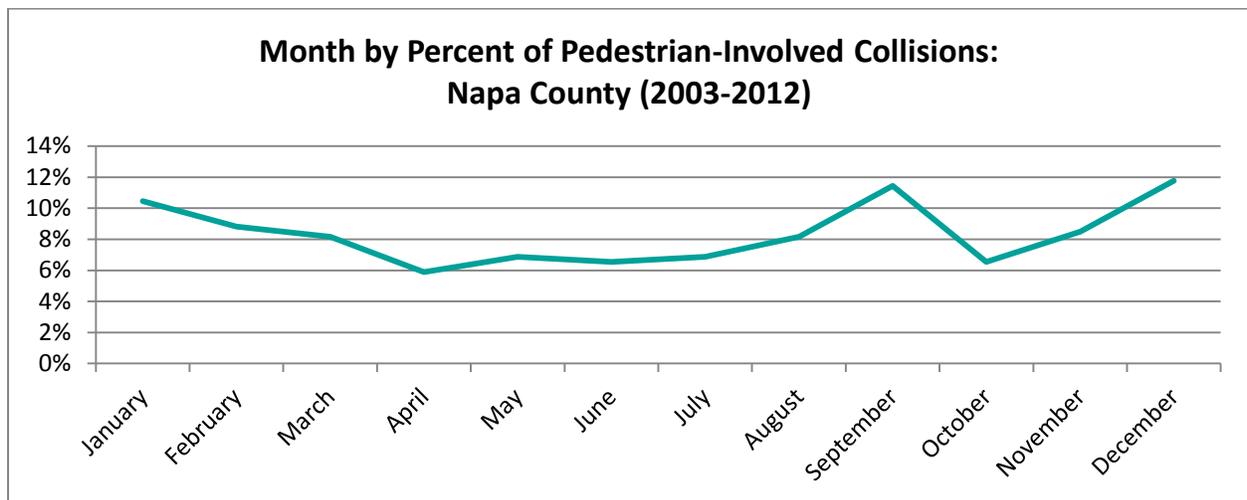


Figure 4 Seasonal Trends for Pedestrian-Involved Collisions

Primary Collision Factors

**Table 7** shows the most common Primary Collision Factors (PCFs) for pedestrian-involved collisions in Napa County.

TABLE 7: NAPA COUNTY PEDESTRIAN-INVOLVED COLLISION SUMMARY PRIMARY COLLISION FACTORS (2003-2012)			
Primary Collision Factor	Number of Collisions		
	Injury	Fatality	Total
Pedestrian Right of Way (Driver not yielding)	105	0	105
Pedestrian Violation	69	5	74
Other	68	3	71
Unknown	35	2	37
Unsafe Speed <sup>1</sup>	25	4	29

Source: SWITRS

1. Refers to unsafe speeds given roadway conditions. This could refer to traveling above the posted speed limit or traveling too fast given the weather conditions (but still at or below the posted speed limit).

As shown in Table 7, the most common Primary Collision Factor (PCF) was drivers not yielding the right-of-way to pedestrians followed by pedestrians crossing illegally (such as crossing against a signal or midblock between signals). Illegal crossings and unsafe vehicle speeds were the leading causes of pedestrian fatalities based on the collision reports over the ten-year period.

The Pedestrian Action variable in the SWITRS dataset describes what the pedestrian was doing immediately before the collision occurred. **Table 8** shows the most common Pedestrian Actions for pedestrian-involved collisions in Napa County.

TABLE 8: NAPA COUNTY PEDESTRIAN-INVOLVED COLLISION SUMMARY PEDESTRIAN ACTIONS (2003-2012)			
Primary Actions	Number of Collisions		
	Injury	Fatality	Total
Crossing in Crosswalk at Intersection	133	3	136
Crossing Not in Crosswalk	82	5	87
Walking In Road, Including Shoulder	58	5	63
Walking, Not in Road	14	1	15
Crossing in Crosswalk, Not at Intersection	10	0	10
Not Stated	4	0	4

Source: SWITRS

As shown in Table 8, the most common pedestrian actions were “Crossing in Crosswalk at Intersection” and “Crossing Not in Crosswalk”. This data emphasizes the importance of enhancing existing marked crosswalks and

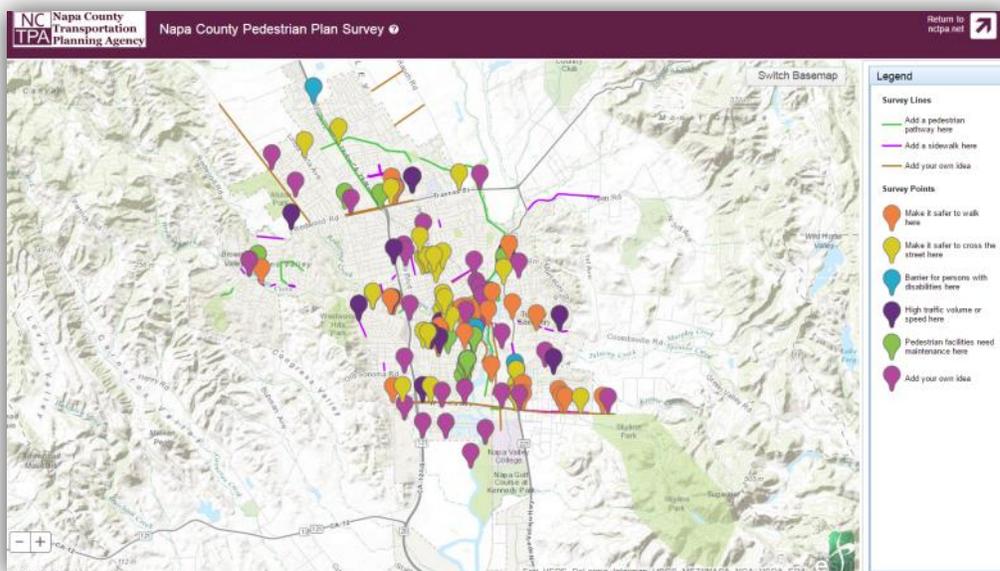
improving access and safety at key desire lines, or the shortest or most easily navigated path of travel between an origin and destination. Education and enforcement regarding pedestrian right-of-way may also be indicated.

## Community Input

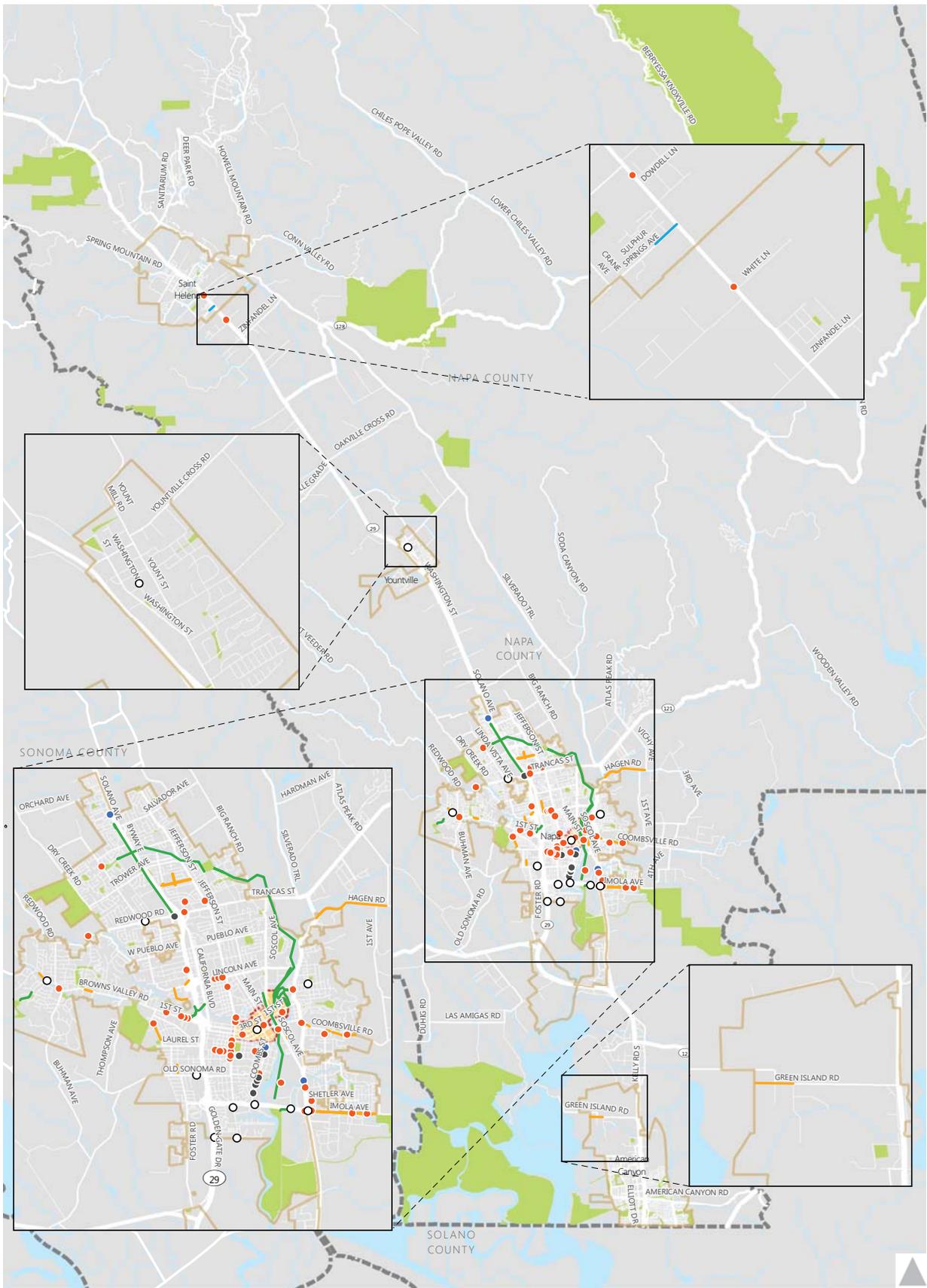
Ongoing public outreach and participation was an integral element in developing the Countywide Pedestrian Plan. Public workshops were held throughout the County in Winter 2015 and were open to all members of the public countywide. For information on format of the public workshops and specific input received in each jurisdiction, refer to Chapters 2 through 7. Napa County residents, employees, and visitors who wanted to provide input but were unable or did not wish to attend the public workshops had the option of submitting their comments online through an interactive mapping tool.

Users placed pins on the maps to highlight desired improvements using pre-set comments or creating their own comment. Preset comments included:

- Make it safer to walk here
- Make it safer to cross the street here
- Barrier for persons with disabilities here
- High traffic volume or speed here
- Pedestrian facilities need maintenance here
- Add a sidewalk here
- Add a pedestrian pathway here



Results from the 70 comments submitted countywide are shown below in Exhibit 2.



- Safety
- ADA
- Add a Pedestrian pathway
- Maintenance
- Other (Add Your Own Idea)
- Add a Sidewalk Here
- Other (Add Your Own Idea)



### Individual Jurisdictions

The following chapters provide individual Pedestrian Plans by jurisdiction. Each chapter focuses on one geographic area within the County, moving from north to south. The location-based chapters are ordered as follows:

Chapter 2: Calistoga

Chapter 3: St. Helena

Chapter 4: Yountville

Chapter 5: Napa

Chapter 6: American Canyon

Chapter 7: Unincorporated

The chapters all contain the same format with information framed specifically for that jurisdiction. Content includes pedestrian setting, countywide public and stakeholder outreach, key opportunity areas within the jurisdiction, priority projects and implementation, and a discussion on funding needs and sources for the jurisdiction plan. These chapters are meant to act as standalone plans to be used in conjunction with key recommendations in the Countywide Implementation Chapter of the countywide plan (Chapter 8), which highlights key countywide support programs and performance goals.

**CHAPTER 6**

# American Canyon Plan



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## Chapter 6

# American Canyon Plan

### Pedestrian Setting

American Canyon is a suburban community at the southern edge of Napa County, with approximately 20,000 residents. It acts as a gateway to Napa County for the many visitors traveling by car from San Francisco to the south and from the west across San Pablo Bay. The city was incorporated in 1992 and although most of the city has sidewalks, some older neighborhoods maintain a rural character with few sidewalks and open vistas. Residents enjoy a well-developed trail system, including small pedestrian pathways that connect neighborhoods and open space. The city does not have a centralized downtown; the main commercial corridor is clustered around SR 29, which runs through the center of American Canyon. Several future developments are expected to provide enhanced pedestrian facilities and potential pedestrian nodes, including Watson Ranch and the industrial development along the northern border of the City just south of the Napa County Airport. Land use patterns for the City are shown in *Exhibit AC-1*. A city destination map, including the locations of public buildings, shopping and tourist attractions, is shown in *Exhibit AC-2*.

## Existing Policies and Programs

To help guide the development of key programs and policies for this Plan, American Canyon’s existing approaches to facilitating and enhancing walking were reviewed with a benchmarking matrix that compares the existing programs, policies, and practices with national best practices. The benchmarking analysis categorizes each jurisdiction’s programs, policies, and practices into three areas as follows:

- **Key Strengths** (areas where the jurisdiction is exceeding national best practices)
- **Enhancement Areas** (areas where the jurisdiction is meeting best practices)
- **Opportunity Areas** (areas where the jurisdiction should consider meeting best practices)

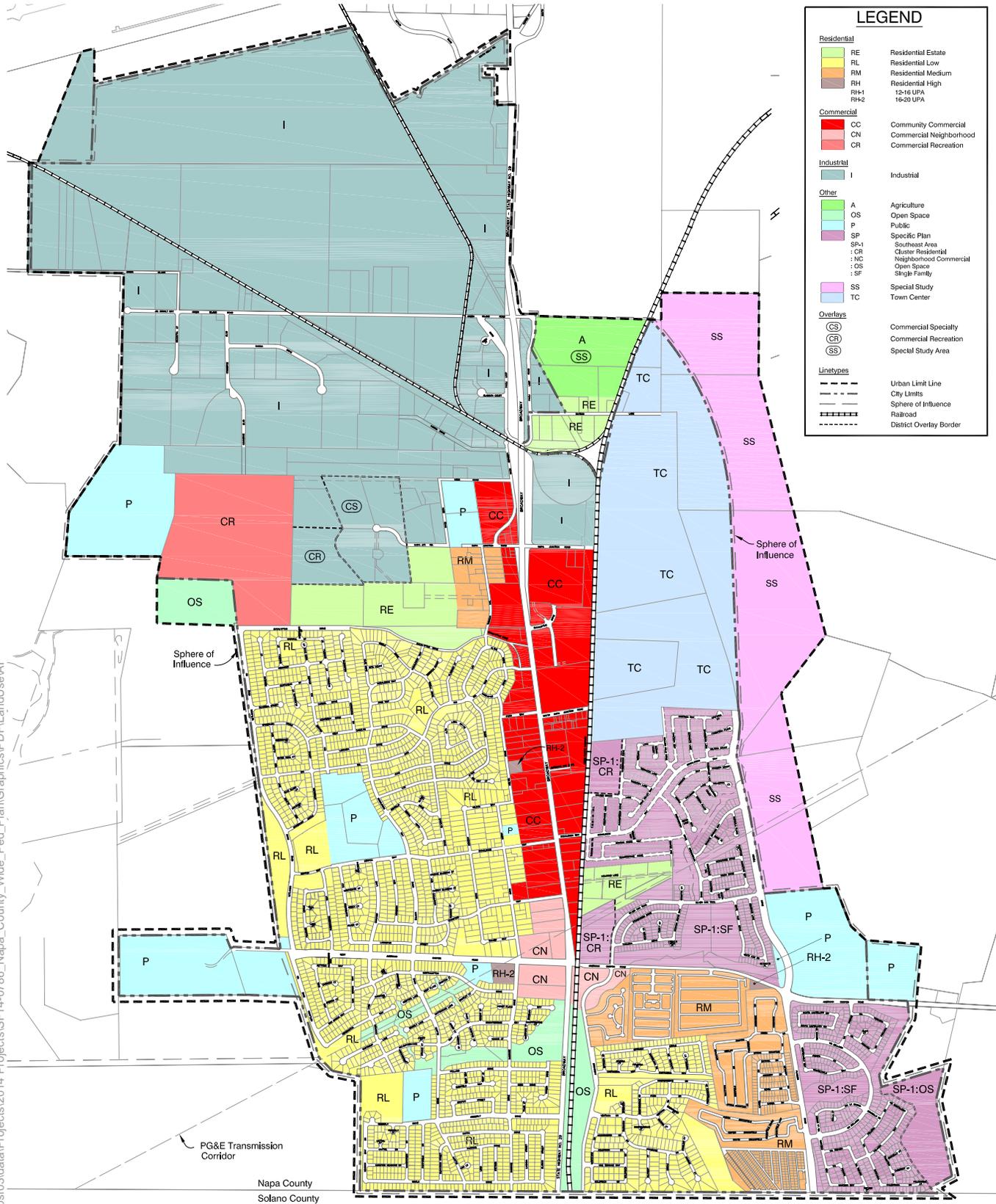
As summarized in **Table AC-1**, the City of American Canyon has made investments in making its streets more accessible to pedestrians of all abilities through its ADA Transition Plan update and excels in such areas as public involvement and traffic calming programs. This plan provides a framework for expanding pedestrian investments in areas of opportunity such as collision reporting and prioritization, inventory of pedestrian facilities, walking audits, and crosswalk design guidelines. The full benchmarking analysis for American Canyon, with associated recommendations, is presented in **Appendix AC-A**.

TABLE AC-1: AMERICAN CANYON BENCHMARKING HIGHLIGHTS

Plans, Policies, & Programs	American Canyon Current Practice	Best Practice Examples
<b>Key Strengths</b>		
<p><b>ADA Transition Plan</b> Compliance with the Americans with Disability Act (ADA) guidelines is important not only to enhance community accessibility, but also to improve walking conditions for all pedestrians.</p> <p>An ADA Transition Plan sets forth the process for bringing public facilities into compliance with ADA regulations.</p>	<p>The city has an ADA Transition Plan from 2008 that includes an inventory of needed improvements for deficient sidewalks and curb ramps in the public right-of-way along priority corridors.</p> <p>The city uses Caltrans standard drawings for curb ramps which include tactile grooves; however, they do not include truncated domes or directional curb ramps.</p>	<ul style="list-style-type: none"> <li>Consider tracking ADA improvements using practices recommended in the ADA Transition Plan 2015 update, to be implemented by the ADA Coordinator</li> <li>Implement directional curb ramps where practical and truncated domes in all cases. Review and revise standard drawings to align with PROWAG recommendations.</li> </ul>
<p><b>Traffic Calming Program</b> Traffic Calming Programs and policies set forth a systematic and consistent approach for addressing neighborhood requests and approvals, as well as standard treatments and criteria.</p>	<p>American Canyon has a Traffic Calming Program that outlines the steps for a community interested in traffic calming, defines the various traffic calming options and appropriate uses, and establishes guidelines for installing the traffic calming measures.</p>	<ul style="list-style-type: none"> <li>Include a line item in the annual budget to create a formal Neighborhood Traffic Management Program (NTMP) to allow additional traffic calming implementation and an inventory of improvements.</li> <li>Encourage the routine use of traffic calming measures beyond speed humps.</li> </ul>
<p><b>Public Involvement</b> Responding to public concerns through public feedback mechanisms represents a more proactive and inclusive approach to pedestrian safety compared to a conventional approach of reacting to pedestrian collisions. Advisory committees serve as important sounding boards for new policies, programs, and practices. A citizens’ pedestrian advisory committee is also a key component of proactive public involvement for identifying pedestrian safety issues and opportunities.</p>	<p>The city’s “SeeClickFix” app allows people to report non-emergency issues on a web-based map of the city. Residents can submit information directly to the city regarding damaged sidewalk, deficient lighting, or other non-emergency issues.</p>	<ul style="list-style-type: none"> <li>Consider adding a page to the City’s website for public input regarding transportation issues with a subsection for pedestrian topics. This category or subcategory may allow residents to file comments or complaints for traffic control devices or dangerous conditions. Encourage broad use of the “SeeClickFix” app for pedestrian issue and opportunity input.</li> <li>Consider creating a formal Active Transportation Advisory Committee (ATAC) for city-specific issues. This Committee could include the American Canyon representative on the ATAC for NVTA.</li> <li>Consider organizing neighborhood groups that identify street needs, including greening and traffic calming.</li> </ul>
<b>Key Opportunities</b>		
<p><b>Collision Reporting</b> Identifying and responding to collision patterns on a regular basis is an important reactive approach to pedestrian safety (which may be combined with proactive measures).</p>	<p>American Canyon does not have a regular practice of reviewing collision data and reports are reviewed as needed on a case-by-case basis. City engineers previously received regular reports from SWITRS, but this data now goes straight to the Police Department.</p>	<ul style="list-style-type: none"> <li>Mapping and monitoring using Crossroads software would allow for more proactive pedestrian safety projects and collision typing for countermeasure selection. GIS efforts may be funded through an Office of Traffic Safety grant.</li> <li>Pedestrian volume data could be used to prioritize locations based on collision rates (collisions/ pedestrian), creating a proactive method to identify treatments and program funding. For implementation, see the Countywide Count Evaluation Program in this plan.</li> </ul>

TABLE AC-1: AMERICAN CANYON BENCHMARKING HIGHLIGHTS

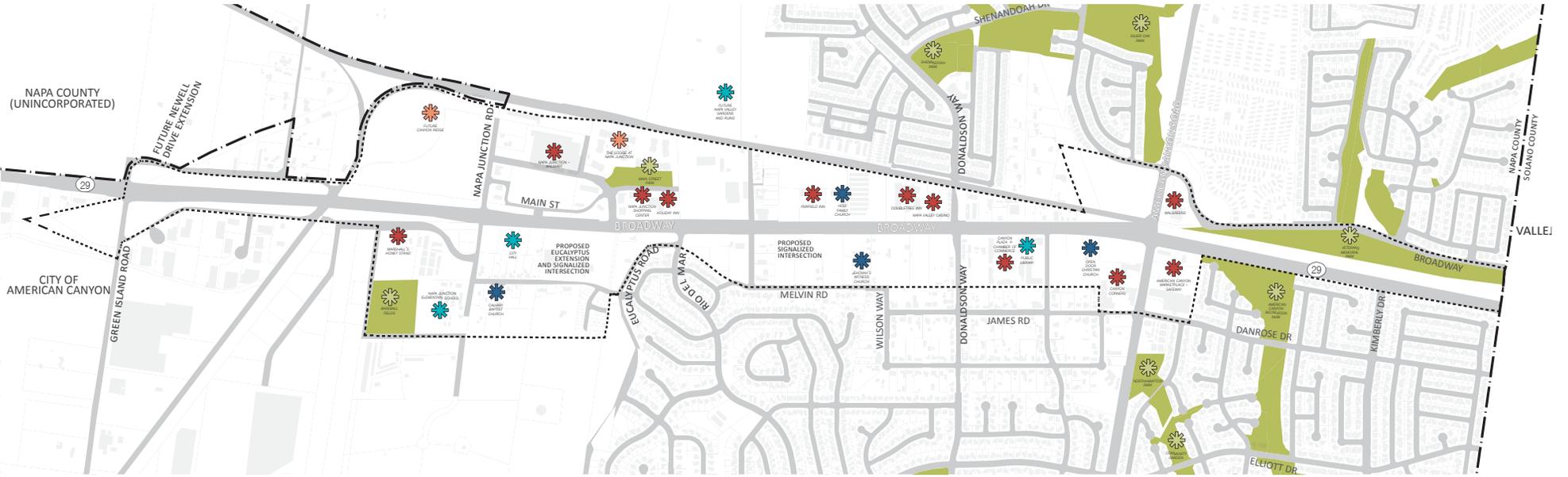
Plans, Policies, & Programs	American Canyon Current Practice	Best Practice Examples
<p><b>Inventory of Pedestrian Facilities</b> A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc.</p>	<p>The city does not have a GIS inventory of sidewalks or other pedestrian facilities.</p> <p>While sidewalk projects do not have a set annual budget, they tend to comprise approximately \$100,000 of the annual capital improvements program funding. The majority of sidewalk projects in the City are funded through grants in addition to local funds.</p>	<ul style="list-style-type: none"> <li>Expand the GIS-based facility inventory, created as part of this plan, to include informal pathways and key pedestrian opportunity areas in the City.</li> </ul>
<p><b>Walking Audit Program</b> Walking audits provide an interactive opportunity to receive feedback from key stakeholders about the study area as well as discuss potential solutions and their feasibility.</p>	<p>American Canyon has not conducted pedestrian walking audits before this plan.</p>	<ul style="list-style-type: none"> <li>Conduct regular walking audits as part of a citywide safety program for pedestrians. This effort could complement a “trip and fall” program or health-oriented programs within the city, as well as distribution of the media campaign NVTA is pursuing.</li> </ul>
<p><b>Crosswalk Design Guidelines</b> A formal policy for crosswalk installation, removal, and enhancement provides transparency in decision-making and creates a consistent application of treatments citywide.</p>	<p>The city currently does not have a crosswalk policy and makes decisions regarding crosswalks on a case by case basis.</p>	<ul style="list-style-type: none"> <li>Consider adopting a crosswalk policy as part of this plan that reflects best practices and recent research to include criteria for installing crosswalk enhancements such as flashing beacons, advanced yield markings, or in-roadway pedestrian signs as well as criteria for midblock crossings where strong desire lines exist.</li> <li>Include criteria in the crosswalk policy for identifying, installing, and enhancing midblock crossings where strong desire lines exist.</li> </ul>



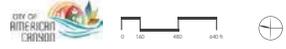
Source: City of American Canyon General Plan Map, December 2010.



# Exhibit AC-1 American Canyon - Land Use Map



**Community Amenities**  
SR-29 Priority Development Area Specific Plan



- LEGEND**
- City of American Canyon
  - Priority Development Area
  - Park
  - Civic Asset/Node
  - Residential Node
  - Commercial Node
  - Place of Worship

Source: MIG.



## Existing Pedestrian Infrastructure

An inventory of existing sidewalks, marked crosswalks, curb ramps and trails was collected on key roadways throughout the city using a combination of aerial imagery and Google Street View imagery from the years 2011 – 2014 (imagery for a few small residential streets dated back to 2007).

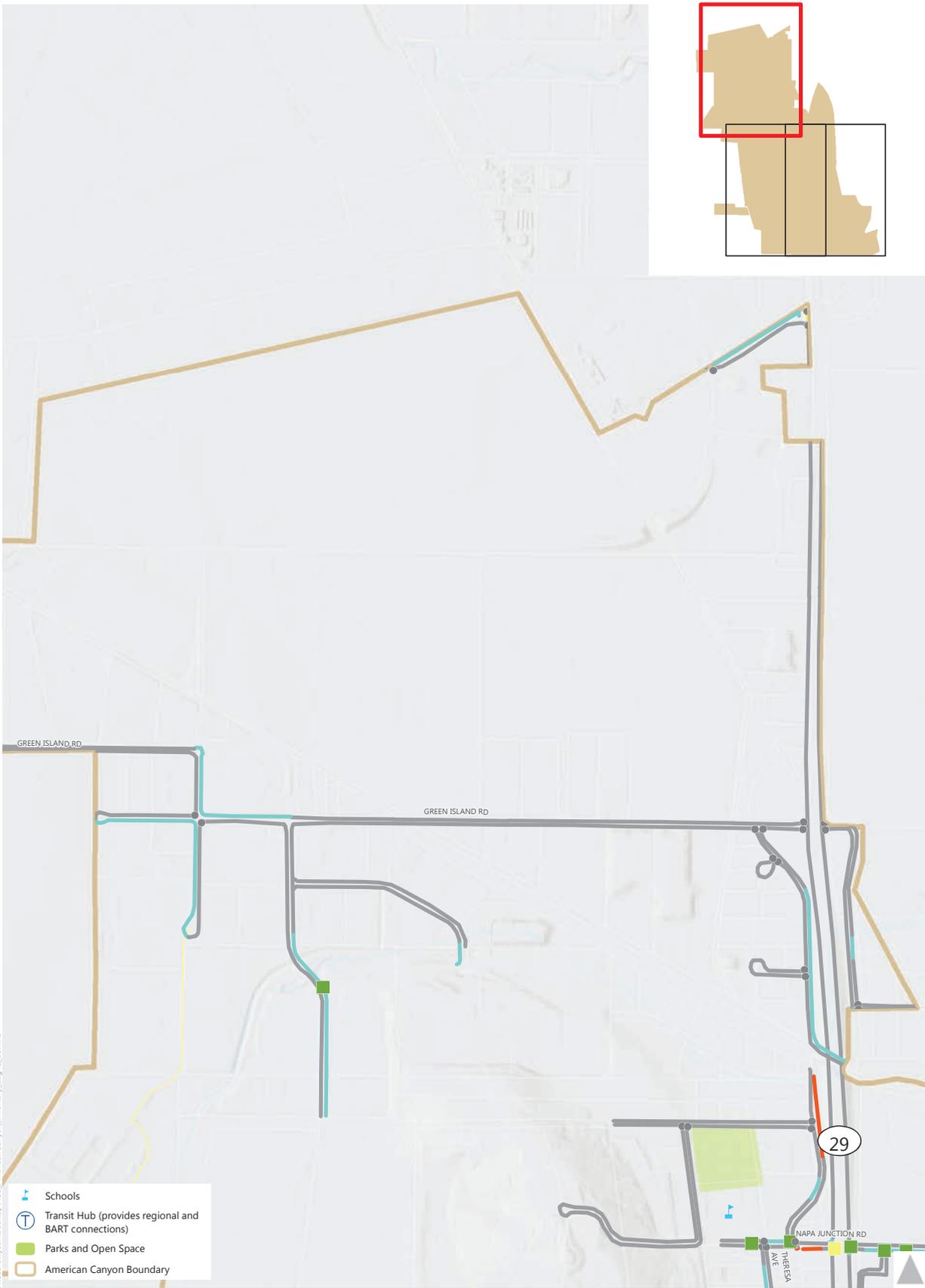
A GIS database assembled for the inventory includes additional detail beyond what is illustrated in the inventory maps, including the style of crosswalk striping, the method of vehicle control at the crosswalk (i.e., traffic signal, flashing beacon, stop sign, or uncontrolled), whether the crosswalk was located in a school zone, and the curb ramp design (i.e., whether the ramp is directional or diagonal and if it has truncated domes). For more information and examples of these types of facilities, please see the Best Practices Toolkit, **Appendix D** of the Countywide Pedestrian Plan.

### *American Canyon Inventory*

A roadway network of 34 miles in the City of American Canyon was identified by city staff for inventory collection. This network was determined by excluding roadways within residential developments constructed after the year 1996, due to adequate sidewalk coverage and curb ramps compliant with ADA legislation at that time. As shown in *Exhibit AC-3*, the residential roadways surveyed generally have a connected sidewalk network, with the exception of the Mc Knight Acres neighborhood which includes north-south streets James Road and Andrew Road, as well as east-west streets Donaldson Way and Crawford Way. City staff identified existing development as a potential constraint for sidewalk installation in this area, as many houses are located close to the edge of the street. City staff also identified the need for crossing improvements at the signalized intersection of SR 29 and Donaldson Way, where crosswalks are marked along all but the north leg. Sidewalk gaps are also present along Donaldson Way approaching SR 29 from both the East and the West. Several completed segments of the Vine Trail and Bay trail run through American Canyon, shown as multi-use pathways on *Exhibit AC-3*, as well as smaller path systems that serve as neighborhood pedestrian connections.



American Canyon: Benton Way at Chaucer Lane



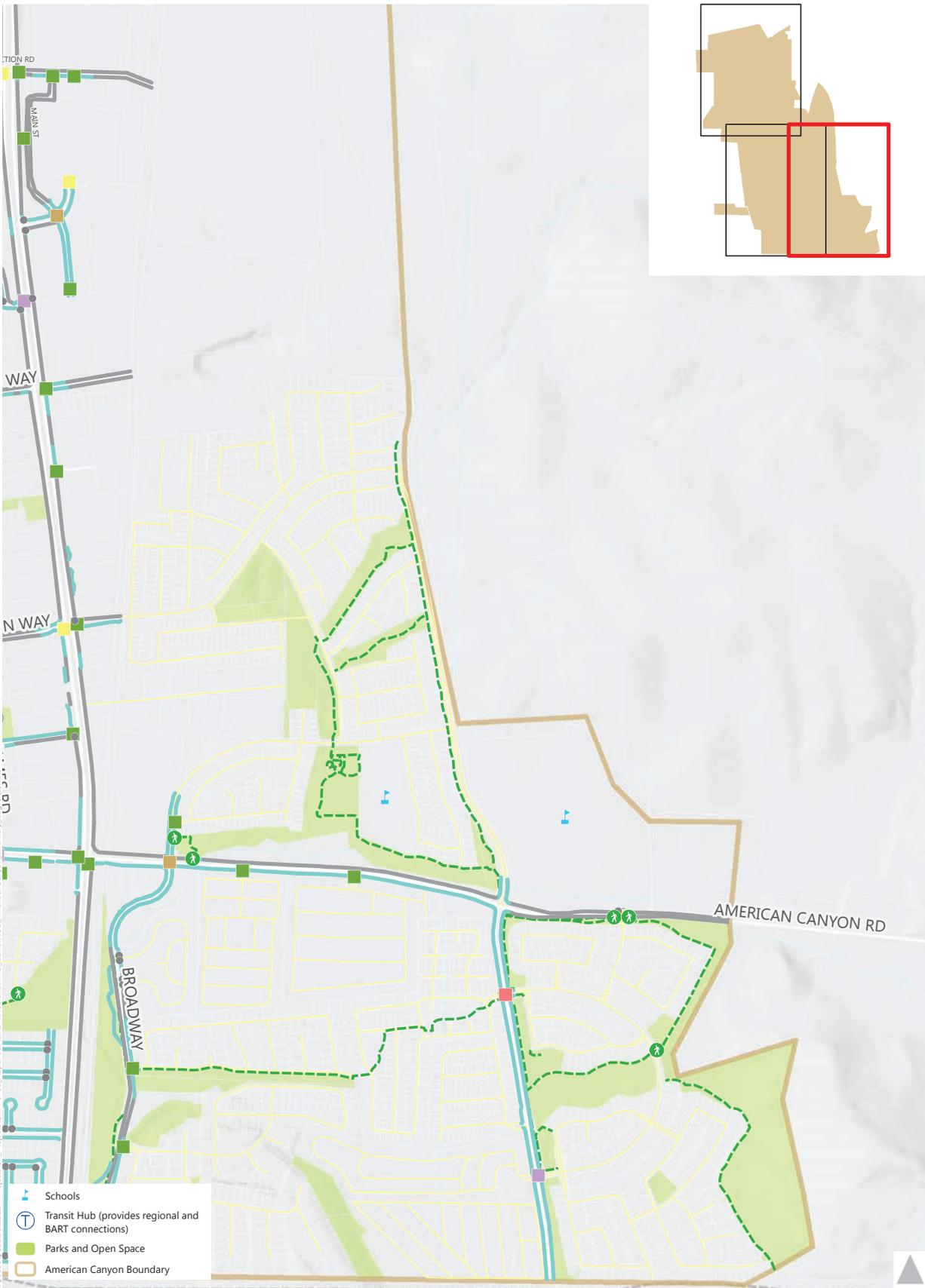
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**Pedestrian Inventory**

- |                  |                       |                   |                    |
|------------------|-----------------------|-------------------|--------------------|
| <b>Sidewalks</b> | <b>Trails</b>         | <b>Crosswalks</b> |                    |
| Asphalt          | Paved Multi-Use Trail | 1                 | Missing Curb Ramp  |
| Existing         | Unpaved Trail         | 2                 | Roads not Surveyed |
| Missing          |                       | 3                 |                    |
|                  |                       | 4                 |                    |



Exhibit AC-3a  
Pedestrian Facility Inventory  
City of American Canyon



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**Pedestrian Inventory**

- |                  |                       |                   |                    |
|------------------|-----------------------|-------------------|--------------------|
| <b>Sidewalks</b> | <b>Trails</b>         | <b>Crosswalks</b> |                    |
| Asphalt          | Paved Multi-Use Trail | 1                 | Missing Curb Ramp  |
| Existing         | Unpaved Trail         | 2                 | Trail Crossings    |
| Missing          |                       | 3                 | Roads not Surveyed |
|                  |                       | 4                 |                    |





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**Pedestrian Inventory**

- |                  |                       |                   |                    |
|------------------|-----------------------|-------------------|--------------------|
| <b>Sidewalks</b> | <b>Trails</b>         | <b>Crosswalks</b> |                    |
| Asphalt          | Paved Multi-Use Trail | 1                 | Missing Curb Ramp  |
| Existing         | Unpaved Trail         | 2                 | Trail Crossings    |
| Missing          |                       | 3                 | Roads not Surveyed |
|                  |                       | 4                 |                    |

Exhibit AC-3b  
Pedestrian Facility Inventory  
City of American Canyon



## Activity Levels

Pedestrian counts were conducted at five locations throughout American Canyon in October and November 2015. These locations were selected based on locations of proposed pedestrian projects in this plan, potential localized safety concerns, expected high expected levels of walking, and proximity to key pedestrian destinations, including schools and downtown commercial areas. **Table AC-2** provides a summary of the two-hour counts completed within the jurisdiction. Count results varied significantly based on nearby neighborhood population density, as well as by the adjacent land use.

TABLE AC-2: AMERICAN CANYON COUNT PROGRAM LOCATIONS					
ID	Jurisdiction	Location	Morning	Evening	School
			7-9AM	4-6PM	2-4PM
AC1	American Canyon	SR 29 and American Canyon Rd.	32	90	
AC2	American Canyon	Melvin Road at Poco Way	3	6	
AC3	American Canyon	James Road at Donaldson Way	23	42	
AC4	American Canyon	Elliott Drive at Donaldson Way	97	55	196
AC5	American Canyon	Elliott Drive at Crawford Way	25		33

The highest volumes of pedestrians were observed at the intersection of Donaldson Way and Elliot Drive, located in close proximity to American Canyon Middle School and Donaldson Way Elementary School, during the hours of 2-4 PM. Observed pedestrian activity at this location was consistently high relative to other locations within American Canyon; nearly 100 pedestrian crossings were recorded during the AM period of 7-9 AM (concurrent with student arrival times) and almost 200 pedestrian crossings were recorded during the afternoon period, which coincides with school dismissal.

The intersection of Melvin Road and Poco Way (AC2) recorded the fewest pedestrian crossings – fewer than 10 pedestrians over each two-hour period observed. Melvin Road is a predominantly residential corridor. There are no marked crosswalks at this one-way stop controlled intersection, and sidewalks are present along one side of each of the intersecting streets.

## Collision Analysis

Collision data was accessed from the California Highway Patrol Statewide Integrate Traffic Records System (SWITRS). This data represents all reported pedestrian-vehicle collisions occurring during the ten-year period from January 2003 to December 2012.

*Exhibit AC-4* shows the locations of these pedestrian collisions in American Canyon.

*Exhibit AC-4* presents raw collision counts only. While this is illustrative of “hot spot” areas in American Canyon, another important consideration for identifying safety focus areas can be collisions per pedestrian (or the collision

rate). Collision rates (not included in the current analysis because pedestrian volume data is not available citywide) can highlight locations where improvements can be added to ensure a focus on areas that may not have as many people walking (but have high collision rates) in addition to areas with high pedestrian volumes and a high number of collisions.

*Hot Spots*

According to data from the California Household Travel Survey (CHTS, 2012), the walking mode share in American Canyon for all trips is 2%, as compared to the countywide walking share of 10%. This aligns with the number of reported pedestrian-related collisions in the city, which is relatively low compared to the rest of the jurisdictions. Three collisions were reported along American Canyon Road in the last ten years and two at the intersection of Benton Way and Wetlands Edge Road along the frontage of American Canyon Middle School.

*Countywide Demographic and Seasonal Trends*

For this plan, a review of collisions countywide included organizing the data by age for children and seniors, and comparing the results across each jurisdiction. Daily and seasonal trends for collision occurrences and primary collision factors were also reviewed countywide. A summary of these results can be found in the *Countywide Walking Trends* chapter of the countywide plan.

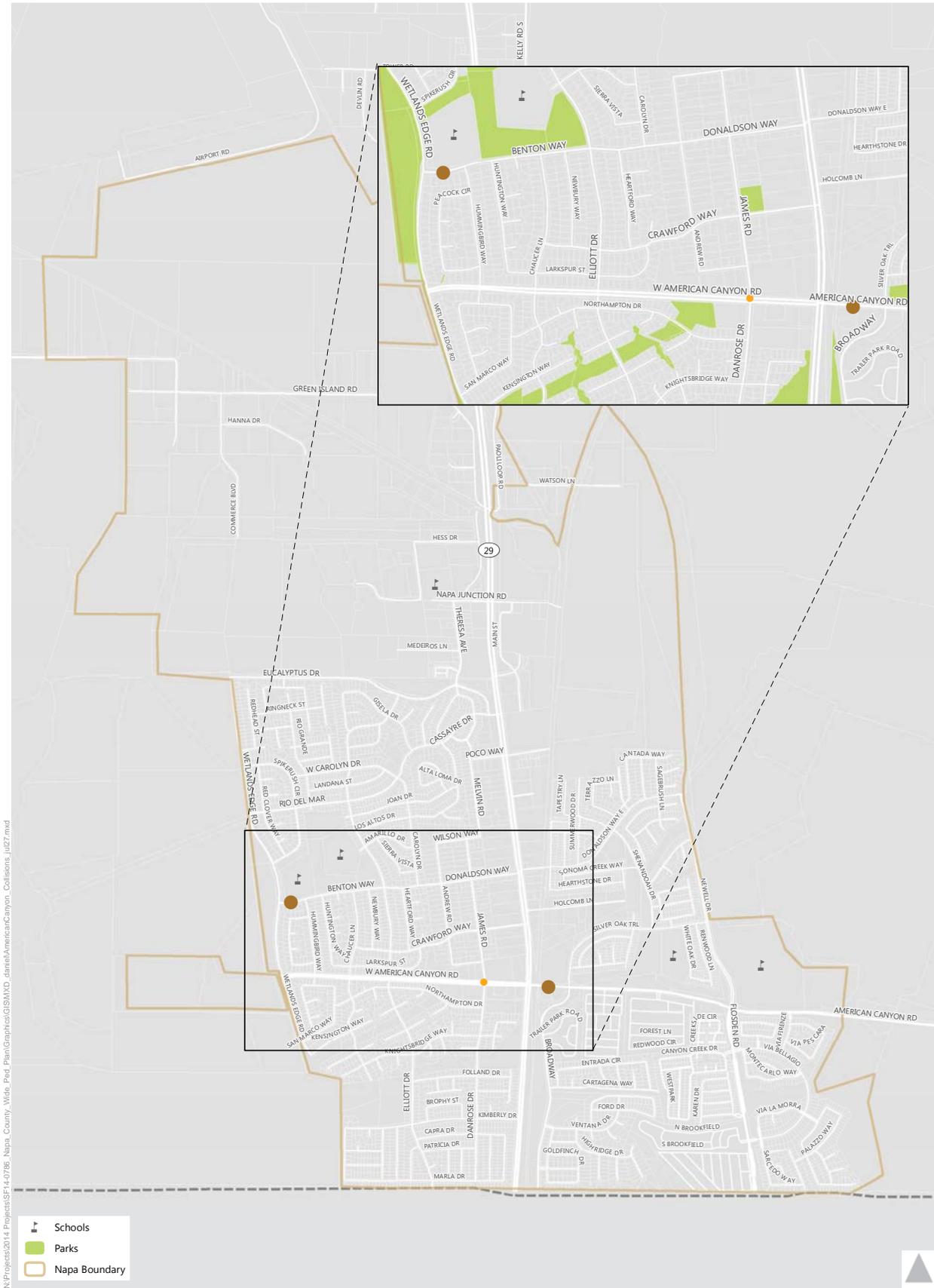
*Pedestrian Actions*

Perhaps one of the more telling sources of information in the SWITRS data is the Pedestrian Action variable, which describes what the pedestrian was doing immediately before the collision occurred. According to the pedestrian actions presented in **Table AC-3**, pedestrian safety issues surrounding collisions in American Canyon are typically focused around crossing locations.

TABLE AC-3: AMERICAN CANYON COLLISION SUMMARY PEDESTRIAN ACTIONS (2003-2012)			
Pedestrian Action	Number of Collisions		
	Injury	Fatality	Total <sup>1</sup>
Crossing Not in Crosswalk	4	0	4
Crossing in Crosswalk at Intersection	3	0	3
Walking, Not in Road	1	0	1

1. Some of the recorded collisions were unable to be mapped due to a missing location in the database.

Source: SWITRS



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**Pedestrian-Involved Collisions 2003-2012**

- 1 # of Injury Collisions
- 2 # of Injury Collisions

**Pedestrian Collision Hotspots**

Density	Intersection	Total Collisions
<span style="color: orange;">●</span>	American Canyon Rd. and James Rd.	1
<span style="color: brown;">●</span>	Benton Way and Wetlands Edge Rd.	2
<span style="color: brown;">●</span>	Broadway and American Canyon Rd.	2

None of these intersections experienced a fatal collision.



## Public and Stakeholder Input

### Countywide Outreach

Input on plan goals and objectives, current pedestrian issues, and desired locations for improvement was solicited through meetings with jurisdiction staff and key stakeholders, countywide public workshops, and an interactive mapping tool made available online. The goal was to develop a community-supported vision for pedestrian improvements. A summary of all input received during this process countywide is displayed in **Table AC-4**. Connectivity and safety were the key themes across the countywide comments.

TABLE AC-4: PUBLIC INPUT RECEIVED COUNTYWIDE		
Comment	Comment Type	Percent of Total Comments
Add a sidewalk here	Connectivity	16%
Make it safer to cross the street here	Safety	15%
Make it safer to walk here	Safety	14%
Add a pedestrian pathway	Connectivity	13%
High traffic volume or speed here	Safety / Walkability	8.5%
Pedestrian facilities need maintenance here	Walkability	4.5%
Barrier for persons with disabilities here	Accessibility	2%
Other (Add your own idea)		27%

Source: Fehr & Peers, 2015

Examples of the comments that were categorized as “add your own idea” in American Canyon are included in the Station One narrative below.

### Public Workshops

Ongoing public outreach and participation was an integral element in developing the Countywide Pedestrian Plan. Public workshops were advertised on NVTA’s website, as well as via local media including the newspaper and radio. Invitations to the public workshops were also sent to local stakeholders, including senior centers, mobility impaired groups, advisory committees and local non-profit groups. The goal of the workshops was to identify public concerns and opportunity areas to inform focus areas, educate the stakeholders, and solicit feedback on the plan vision and goals.

Public workshops were held throughout the County in Winter 2015: in Napa on January 22 at NVTA; in American Canyon on January 27; in St. Helena on January 28; and in American Canyon on February 4. Due to recent public workshops held in Calistoga through development of their Active Transportation Plan in 2014, workshops were not held in the City. All workshops were open to all members of the public countywide. Photos of workshop posters are included in **Appendix A** of the countywide plan.

The format for each public workshop was the same and consisted of four stations:

- **Station One: Issues/Opportunities**

At Station One, participants voted on a list of common barriers to walking to indicate those that were most relevant to the walking environment in their jurisdiction and countywide. Participants also wrote comments on large-scale aerial maps placed on tables or on the floor to highlight existing barriers to pedestrian travel and locations where improvements were needed. Suggested comments included “Make it safer to cross the street here” or “High traffic volume or speed here”. Comments were mapped in GIS after the workshops to visualize the areas of reported pedestrian needs and inform the decision for focus area locations. The results of this mapping exercise included over 40 comments in the City of American Canyon, and results are shown in *Exhibit AC-5*. Comments were grouped into six categories, including a miscellaneous category “Add your own idea”. This category was used for comments that did not fall into any of the major themes shown in Table AC-4. Examples of these miscellaneous comments included documentation of cut-through traffic, future Vine Trail connections, and locations of barriers to neighborhood pedestrian connections. All public comments were considered in the process to choose focus areas for the Plan, discussed under *Opportunity Areas* in this Plan, and when identifying candidate pedestrian improvements.



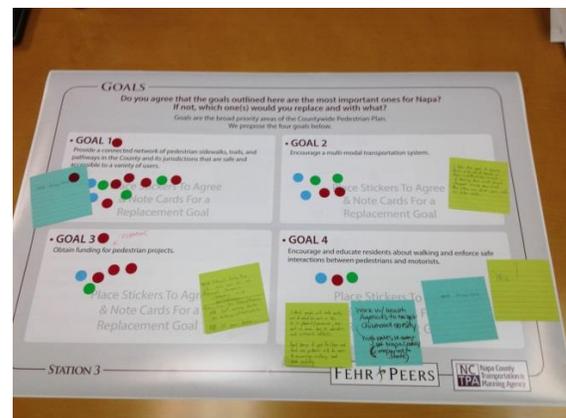
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- **Station Two: Best Practices Toolbox**

Station Two was an informative station that displayed examples of best practices for pedestrian treatments frequently used in pedestrian planning efforts. Treatments included sidewalk buffers, intersection features, crosswalk enhancements, as well as signal and striping modifications.

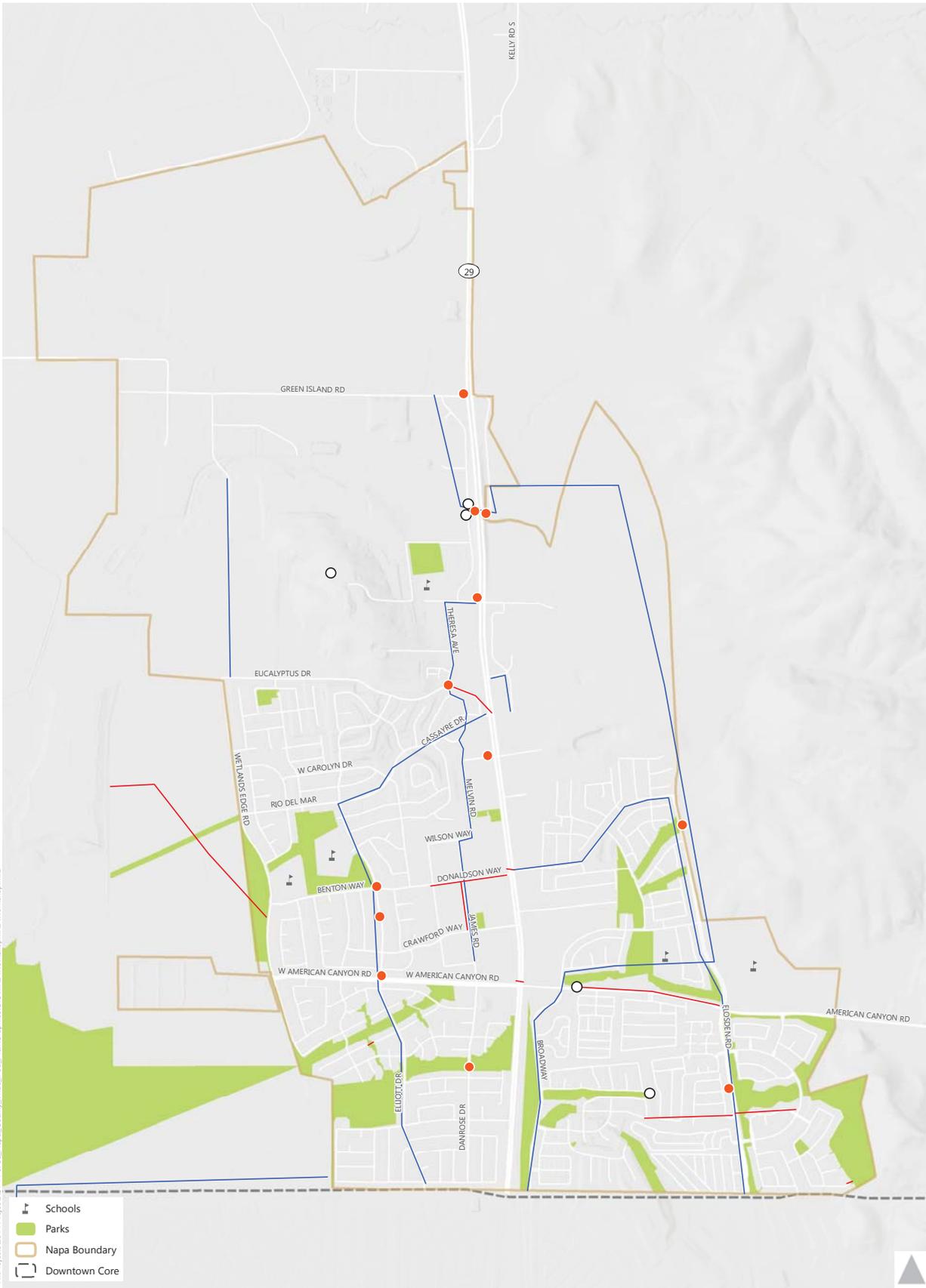
- **Station Three: Goals Visioning**

At Station Three, participants had the opportunity to weigh in on draft goals for the plan and write their own vision statement. Conflicting desires related to transportation were also presented on either end of the scale and participants were asked to place stickers where they thought the balance should be struck. Tradeoffs included ease of walking compared to ease of driving and creating a comprehensive pedestrian network compared to improved transit service. This information is valuable to determine where the public would like resources to be focused.



- **Station 4: Collision Maps**

Station Four was an informative station that displayed the collision maps shown in this plan.



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- Schools
- Parks
- Napa Boundary
- Downtown Core

- Safety
- ADA
- Sidewalk/Pathway
- Maintenance
- Other
- Other

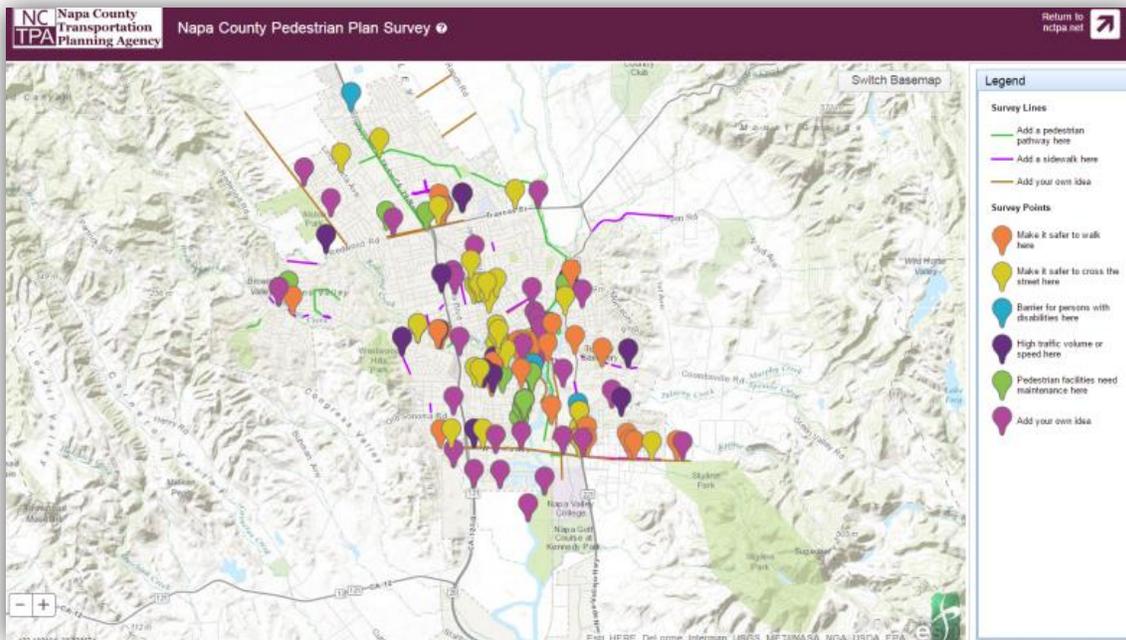


### Online Survey Mapping Tool

Napa County residents, employees, and visitors who wanted to provide input but were unable or did not wish to attend the public workshops had the option of submitting their comments online through an interactive mapping tool. Users placed pins on the maps to highlight desired improvements using pre-set comments or creating their own comment. Preset comments included:

- Make it safer to walk here
- Make it safer to cross the street here
- Barrier for persons with disabilities here
- High traffic volume or speed here
- Pedestrian facilities need maintenance here
- Add a sidewalk here
- Add a pedestrian pathway here

Results from the 70 comments submitted countywide are shown in *Exhibit 2* of the countywide plan.



## American Canyon-Specific Focus Groups

At the outset of the plan development process, meetings were held with key staff from American Canyon to initiate the planning process on December 16, 2014.

This meeting included a discussion of existing programs, policies and practices. Examples from other cities as well as recommendations for improvements are provided in the benchmarking summary table in **Appendix AC-A**.

Jurisdiction staff also provided input during the initial benchmarking meeting and at the public workshops on key areas where pedestrian improvements are planned and in some cases, where connections and safety improvements are desired. This input was used to inform potential opportunities for walking audit routes, as well as discussed along with the facility inventory maps under the *Existing Pedestrian Infrastructure* section of this plan.

Key goals for the pedestrian planning process were also discussed with American Canyon staff and included creating a sidewalk maintenance policy and updating the ADA Transition Plan. These goals are incorporated into key programmatic and policy recommendations in this plan.

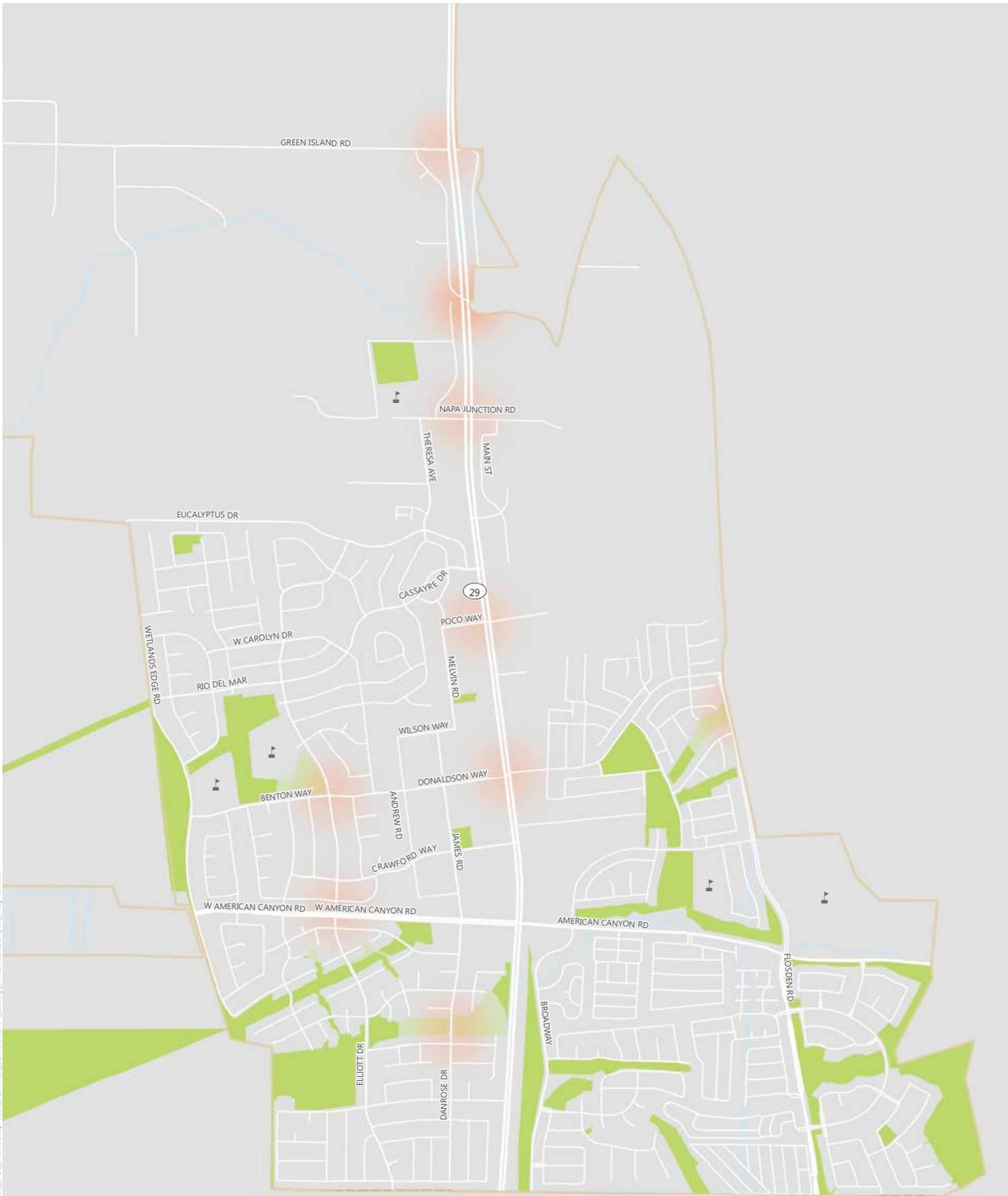
Additional focus group meetings were held for the American Canyon walking audit on May 19, 2015, and to review the list of suggested pedestrian projects on August 20, 2015.

## Perceived Barriers

As shown in **Table AC-4**, connectivity and safety are two of the top pedestrian issues identified from the public. To geographically visualize the safety concerns in American Canyon, a heat map was created, shown in Exhibit AC-6. This map shows the density of safety-related public comments received during the outreach process, and is intended to represent perceived barriers to walking. These locations may be under-represented in the collision data due to a high level of collision under-reporting with SWITRS data<sup>6</sup> or fewer people walking as a result of these perceived issues. This map provides an important lens into key areas for concern, and may help supplement collision data to identify locations where near misses and other safety-related (but non-reported) issues may be present.

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<sup>6</sup> Sciortino, S., Vassar, M., Radetsky, M. and M. Knudson, "San Francisco Pedestrian Injury Surveillance: Mapping, Underreporting, and Injury Severity in Police and Hospital Records," *Accident Analysis and Prevention*, Volume 37, Issue 6, November 2005, Pages 1102-1113



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This map is a visual representation of safety-related public comments (i.e. "make it safer to walk here" or "high traffic volume or speed here") received during the outreach process, intended to represent potential barriers to walking. These locations may be under-represented in the collision data due to under-reporting or fewer people walking as a result of safety concerns. This map may help supplement collision data to identify locations where near-misses or other safety-related issues may be present.

-  Schools
-  Parks
-  American Canyon Boundary

**Safety-Related Comments**

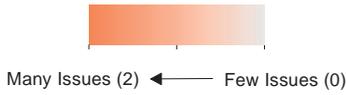


Exhibit AC-6  
Perceived Barriers: As Visualized by Safety-Related Public Comments  
City of American Canyon

## Opportunity Areas

The City of American Canyon is focused on updating and implementing their ADA Transition Plan, and they have recognized this moment as a key opportunity to enhance pedestrian safety and mobility in concert with the accessibility updates. The city's single-family residential subdivisions and the commercial corridor's orientation along SR 29 present unique challenges to the pedestrian environment. This plan expands on existing efforts by developing a list of proposed pedestrian facilities within key focus areas of the city and referencing those that have been developed by other plans. Initial focus areas for the Plan were developed using a data-driven GIS process that evaluates several factors related to the built environment and demographics that affect the propensity to walk. This process, called the "Ped INDEX", was adapted by work done by the US Environmental Protection Agency (EPA) has been used in several plans in the Bay Area to map the qualitative likelihood of demand for pedestrian activity.

### Ped INDEX

The main factors used in the Ped INDEX are population density, land use mix, presence of schools or parks, intersection density, location of downtown commercial areas, and age. These factors resulted in a "heat map" which displays an estimate for relative pedestrian demand on the streets throughout the City of American Canyon. More detail on the Ped INDEX methodology and results as well potential applications can be found in **Appendix B** of the countywide plan.

To balance high pedestrian demand areas with key areas of need in American Canyon, additional data layers were used to display pedestrian deficiencies. These include gaps in sidewalk and reported pedestrian-involved collisions. In general, places with high pedestrian demand and a high infrastructure need are shown as target areas that could be prioritized for pedestrian improvements. The resulting heat map with overlaid demand and deficiencies is shown in *Exhibit AC-7*.

As illustrated on *Exhibit AC-7*, Ped INDEX focus locations include the area adjacent to American Canyon Road and Canyon Oaks Elementary School, neighborhoods adjacent to Donaldson Way Elementary School, as well as neighborhood pockets near Elliott Drive and Folland Drive. After reviewing the locations of comments received during public outreach and the alignment with focus locations on the Ped INDEX maps, two potential walking audits were recommended to city staff:

- **Western Routes to School:** Elliot Drive from American Canyon Road to Donaldson Way; Donaldson Way from Elliot Drive to SR 29; James Road from Donaldson Way to Crawford Way (1 mile)  
This area includes connections to the hot spots such as Donaldson Elementary School and American Canyon Middle School. It also covers a portion of Donaldson Way that lacks sidewalks and acts as a key route for school children, which aligns with desired improvements from both city staff and the public input. James Road also lacks sidewalk and is a key connector to this route. Several public comments were

received highlighting the need for traffic calming along Elliot Drive due to cut through traffic as well as the need for improved crossings at SR 29 and Donaldson Way.

- **Eastern Routes to School:** American Canyon Road from Newell Drive to Danrose Drive; James Road from American Canyon Road to Crawford Way (1 mile)

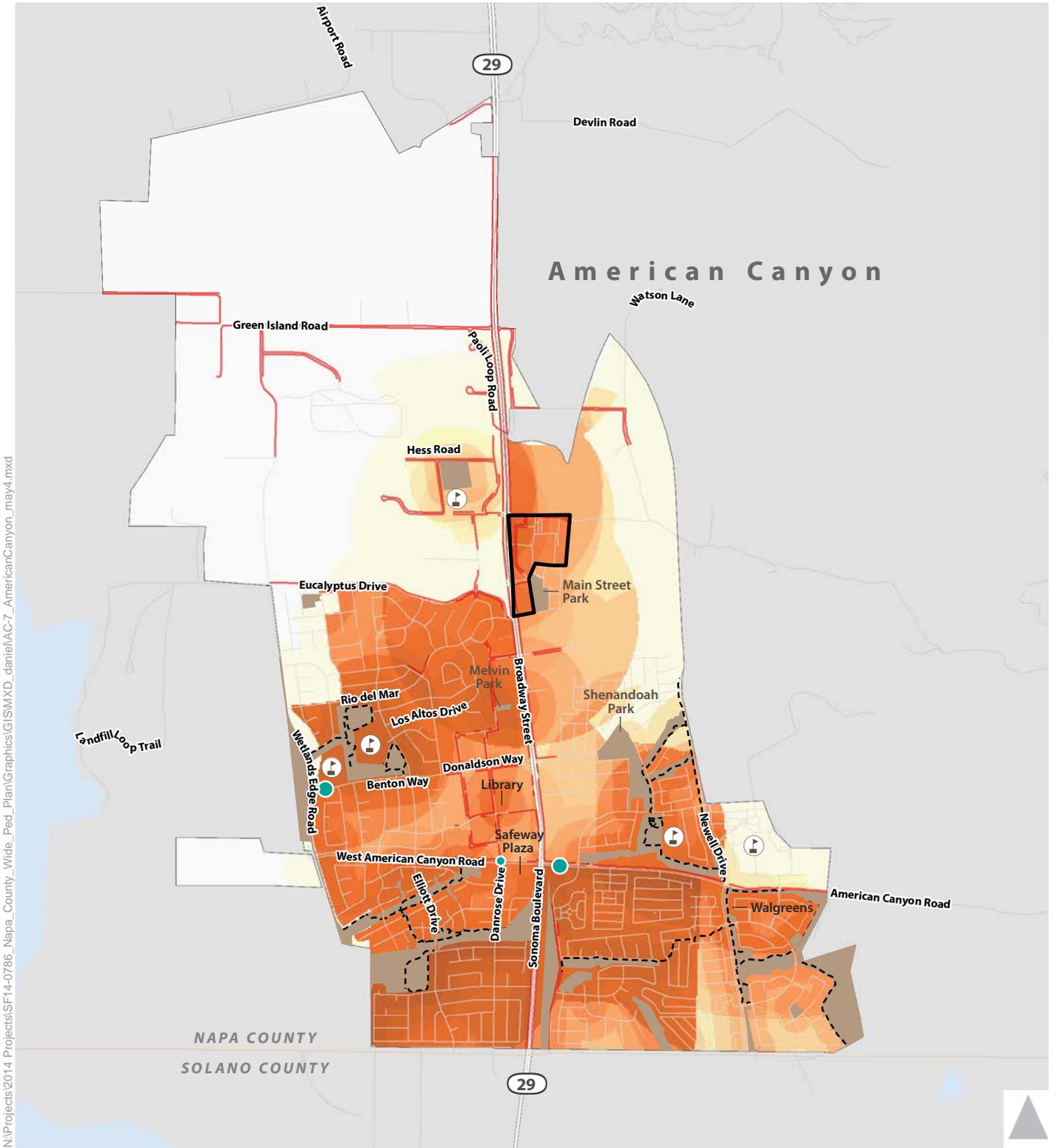
Several comments during the workshop highlighted the lack of sidewalk along American Canyon Road, a key connection to the high school. Several pedestrian collisions have also been reported along this route, between James Road and Broadway. This walking audit route also addresses pedestrian connections from the residential development south of American Canyon Road through Silver Oak Park to Canyon Oaks Elementary School.

After discussions with city staff regarding candidate locations, a combination of the above recommended focus areas, for a total of just over one mile, was chosen for study during walking audits:

- Donaldson Way from SR 29 to Elliot Drive
- James Road from Donaldson Way to Crawford Way
- Elliot Drive from Donaldson Way to W American Canyon Road

## 2016 ADA Transition Plan Update

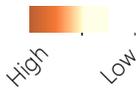
The city refreshed their 2008 ADA Transition Plan to document any recently improved curb ramps and sidewalks marked deficient in the original Plan. Field measurements were also collected along the walking audit routes shown above to determine the accessibility of sidewalks, curb ramps, driveways, and signal accommodations in the public right of way. The survey results for each location were mapped in GIS for future tracking. Areas that were outside of the audit route that were listed as deficient in the 2008 plan were also mapped – these areas were noted as needing updates or as recently improved requiring field verification. A refreshed schedule of improvements and prioritization categories for removing accessibility barriers in the public right-of-way was also developed as part of the updated plan. Best practices for tracking compliance of facilities were discussed and summarized for use going forward.



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**Demand:**

**Pedestrian Index Score**



**Deficiencies:**

**Pedestrian Collisions (Injuries)**



- Pedestrian Fatality
- Missing Sidewalks

**Legend:**

- Major Retail
- Parks
- Trail/Path
- School

Exhibit AC-7

American Canyon - Pedestrian Index Demand & Deficiencies



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## Priority Projects and Implementation Plan

An important outcome of this plan is the designation of a priority project list and an implementation plan for these projects. The priority project list was assembled based on:

- Results of the Walking Audit conducted for the plan
- Projects recommended through related planning efforts, such as the Countywide Transportation Plan (CTP)
- Conversations with staff and stakeholders regarding other local priorities

### Walking Audits

Walking audits were conducted in April 2015 with Cheryl Braulick of American Canyon Public Works to observe field conditions and brainstorm potential ideas for improvement.

During the walking audits, visual surveys were conducted to observe physical characteristics and conditions of the pedestrian environment as well as the connectivity and continuity of the surrounding pedestrian network. A debrief was held afterwards with the group to discuss observations and determine suggestions for improvements.

### Project List and Map

Suggested pedestrian projects developed during the Pedestrian Plan walking audits and similar, recent efforts are shown in *Exhibit AC-8*. Descriptions of each project and additional program and policy recommendations are included below under *Priority Projects*.

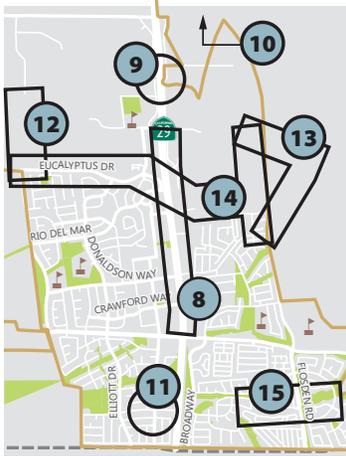
### American Canyon Improvements

#### Tier 1 and 2 Pedestrian Improvements

- 1 AC-1: Eucalyptus Drive/Theresa Avenue Intersection, Complete Streets (No. 2 Constrained CTP Project)
- 2 AC-2: SR 29 Traffic Calming and James Road Sidewalks
- 3 AC-3: Donaldson Way Improvements
- 4 AC-4: Safe Routes to School Improvements
- 5 AC-5: Elliot Drive Traffic Calming
- 6 AC-6: American Canyon Road Improvements
- 7 AC-7: SR-29 Pedestrian Crossings \*

- American Canyon Walking Audit
- School
- Transit Hub  
Regional and BART connections

#### Previously Planned Improvements\*



- 8 AC-1: SR 29 Gateway (No. 7 Constrained CTP Project)
- 9 AC-9: Vine Trail Railroad Crossing
- 10 AC-10: Pedestrian/Bicycle Railroad Crossing
- 11 AC-11: Danrose/Kimberley Crossing Improvements
- 12 AC-12: Commerce Blvd Extension
- 13 AC-13: Newell Open Space Pathway
- 14 AC-14: River to Ridge Trail
- 15 AC-15: Walsh Creek Neighborhood Pathway

\*These projects are referenced in other planning documents, and were not evaluated during the scope of this Plan.



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## Priority Projects

Existing funding for pedestrian facilities is limited and cannot successfully cover more than a fraction of the recommendations in this plan. Available regional, state and Federal funding sources and grant cycles are highly competitive among worthy projects and other jurisdictions. To help prioritize pedestrian investments for the limited available funding, this plan prioritizes projects according to six criteria:

- Local importance
- Safety enhancements
- Proximity to schools
- Proximity to transit
- Sidewalk gap and trail connections
- Cost

These criteria and the metrics used to define them are described in more detail in **Appendix AC-C**. Each pedestrian improvement project is shown in one of two tiers based on the number of evaluation criteria it meets. Detailed results and project descriptions can be found in **Appendix AC-C**. A summary of the improvements is shown in **Table AC-5**.

### *Other Planned Improvements*

The City of American Canyon recently identified several pedestrian-related improvements in planning efforts beyond this plan, such as the *General Plan Circulation Element* (2013) and the *American Canyon Bicycle Plan* (2012). Improvements include pedestrian overcrossings of SR 29, enhanced pedestrian access on Commerce Boulevard to connect to the northern industrial area of the city, several multi-use pathway connections, and crossing enhancements at the residential intersection of Danrose Drive and Kimberly Drive. These improvements are in various stages of planning; many are being considered as a component of specific development such as the American Canyon Town Center or focused planning efforts such as the Broadway District Specific Plan. These planned improvements were assigned to “Tier Three” in **Table AC-5** and were not evaluated for prioritization.

TABLE AC-5: AMERICAN CANYON PEDESTRIAN IMPROVEMENTS

Project ID	Location	Description	Pedestrian Component	Estimated Cost
<b>ON-GOING SYSTEM MAINTENANCE</b>				
Sidewalk Gap Closure and Maintenance (No. 1 2015 CTP Program)	Citywide	Sidewalk maintenance, rehabilitation and expansion	Sidewalks Maintenance	\$\$\$
<b>TIER ONE</b>				
<b>AC-2</b> SR 29 Traffic Calming and James Road Sidewalks	James Road, Melvin Road, Cassavre Drive, Theresa Avenue	Traffic calming study	Traffic calming	\$1,035,000
	James Road, Donaldson Way to American Canyon Road	Near Term: Sidewalk installation	Sidewalks	
		Medium-Term: Sidewalk installation	Sidewalks	
		Long-Term: Sidewalk installation	Sidewalks	
<b>AC-3</b> Donaldson Way Improvements	Donaldson Way, SR 29 to James Road	Sidewalk	Sidewalk	\$570,900
	Donaldson Way, James Road to Andrew Road	Tree trimming	Maintenance	
	Donaldson Way at Andrew Road	Marked crosswalks	Crossing treatments	
	Donaldson Way, Carolyn Drive to Andrew Road	Sidewalks	Sidewalk	
<b>AC-4</b> Safe Routes to School Improvements	Donaldson Way at Elliott Drive	Roundabout and relocated bus stop	Traffic calming Crossing treatments	\$356,600
	Benton Way at Chaucer Lane	Crosswalk enhancements <sup>1</sup>	Crossing treatments	
<b>AC-7</b> SR 29 Pedestrian Crossings <sup>2</sup>	SR 29 at American Canyon Road and Rio Del Mar	Grade-separated pedestrian crossings	Crossing treatments	\$\$\$
<b>TIER TWO</b>				
<b>AC-1</b> Eucalyptus Drive/Theresa Avenue Intersection, Complete Streets (No. 2 CTP Project)	Eucalyptus Drive at Theresa Avenue	Roundabout (As part of Eucalyptus Drive Realignment Project)	Traffic Calming	\$\$

TABLE AC-5: AMERICAN CANYON PEDESTRIAN IMPROVEMENTS

Project ID	Location	Description	Pedestrian Component	Estimated Cost
<b>AC-5</b> Elliot Drive Traffic Calming	Elliot Drive from Donaldson Way to Crawford Way	Neck downs with bicycle access	Traffic calming	\$\$
		Signage	Signing and striping	
	Elliot Drive at Crawford Way	Traffic circle with enhanced <sup>1</sup> marked crosswalk	Traffic calming Crossing treatments	
	Elliot Drive at Larkspur Street	Traffic circle	Traffic calming	
	Elliot Drive from Larkspur Street to American Canyon Road	Raised median with restriping and relocated bus stop	Crossing treatments Transit	
<b>AC-6</b> American Canyon Road Improvements	American Canyon Road at Elliot Drive	Near Term: Crosswalk enhancements <sup>1</sup>	Crossing treatments ADA ramps	\$\$
	West of Elliot Drive	Long Term: Feasibility study for linear park	Pathway Traffic calming	
<b>PREVIOUSLY PLANNED IMPROVEMENTS<sup>4</sup></b>				
<b>AC-8</b> SR 29 Gateway (No. 7 CTP Constrained Project list)	SR 29, American Canyon Road to Napa Junction Road	Pathway, enhanced crosswalks <sup>1</sup> , Class I pathway and Class IV bikeways	Sidewalks Crossing Treatments Pathway	\$\$\$
	SR 29 at Donaldson Way	Crosswalk enhancements <sup>1</sup>	Crossing treatments ADA ramps	
<b>AC-9</b> Vine Trail Railroad Crossing <sup>3</sup>	SR 29 at Paoli Loop Road	Grade-separated Vine Trail crossing	Crossing treatments	\$\$\$
<b>AC-10</b> Pedestrian/Bicycle Railroad Crossing <sup>3</sup>	Railroad tracks east of SR 29 near proposed "Town Center"	Grade-separated pedestrian crossing	Crossing treatments	\$\$\$
<b>AC-11</b> Danrose / Kimberly Crossing Improvements <sup>3</sup>	Danrose Drive at Kimberly Drive	Feasibility study for reduced crossing distances	Traffic calming Crossing treatments	\$

TABLE AC-5: AMERICAN CANYON PEDESTRIAN IMPROVEMENTS

Project ID	Location	Description	Pedestrian Component	Estimated Cost
<b>AC-12</b> Commerce Boulevard Extension <sup>3</sup>	Commerce Boulevard, from Eucalyptus Drive to southern terminus of Commerce Boulevard	Multi-use path	Pathway	\$\$
<b>AC-13</b> Newell Open Space Pathway <sup>3</sup>	Newell Creek, Newell Open Space Entrance at Newell Drive through Newell Open Space	River to Ridge multi-use path connection	Pathway	\$\$\$
<b>AC-14</b> River to Ridge Trail <sup>3</sup>	Eucalyptus Drive and South Napa Junction Road from Wetlands Edge Road to Newell Drive	Multi-use path from Theresa Avenue to Newell Drive; Class II bike lanes west of Theresa Avenue	Pathway / Bike Lanes	\$\$\$
<b>AC-15</b> Walsh Creek Neighborhood Pathway <sup>3</sup>	Walsh Creek, from Cartagena Way to Via Bellagio	Multi-use path and pedestrian bridge	Pathway	\$\$\$

1. An enhanced crosswalk includes additional safety treatments such as curb extensions, reduced curb radii, or pedestrian refuge islands. These enhancements are recommended to address safety concerns such as higher speed or volume roadways, wider roadways, and roadways where motorists are less likely to yield to pedestrians. Specific recommendations are included in Appendix C-C. For additional information on the application of these enhancements, refer to the Crosswalk Policy of this plan.

2. Source: American Canyon Circulation Element, 2013. This project was developed through separate and ongoing efforts and was evaluated for prioritization due to local importance.

3. Source: American Canyon Bicycle Plan, 2012

4. These projects are pedestrian projects that are referenced in other planning documents. These projects were not evaluated during the scope of this Plan; however, they may be pursued through separate and ongoing efforts.

\$\$\$ - high cost (>\$1million); \$\$ - medium cost (\$100k-\$1million); \$ - low cost (<\$100k)

Source: Fehr & Peers, 2016

The trail system in American Canyon is a key asset to the community and several recommendations for new trail segments, including neighborhood connections and cut-throughs, shown in Exhibit AC-5, were received during the public workshops for this plan. When possible, these recommendations should be considered as trail segments such as those in AC-10, AC-15, and AC-18 are developed and implemented. Coordination with regional trail planning will also help ensure planned trail segments such as the Vine Trail and River to Ridge trail have community support and include local wayfinding.

Specific locations for sidewalk maintenance needs were noted during the walking audits and are included in project AC-6. Ongoing monitoring of sidewalks will ensure a broad and continuous application of sidewalk maintenance citywide. These efforts could be coordinated with accessibility updates for priority sidewalks and curb ramps in the ADA Transition Plan, to include consideration of locations surveyed as part of the 2015 ADA Transition Plan Update. Suggested

tracking methods in the Update will ensure efficient use of construction resources and implementation of the ADA Transition Plan by documenting ADA compliance in the field.

### Supporting Programs and Policies

Key program and policy recommendations that complement the engineering-related projects are shown below in **Table AC-6**. Many of these recommendations draw from the benchmarking exercise completed at the onset of the plan development. The recommendations encompass education, encouragement, and enforcement activities.

**TABLE AC-6: AMERICAN CANYON PROGRAM AND POLICY RECOMMENDATIONS**

Program or Policy	Recommendations
<b>Education and Encouragement</b>	
Safe Routes to School (SRTS) Coordination	Coordinate with the Napa County Office of Education to continue SRTS programs in the city, and determine feasibility of implementing recommendations under the Safe Routes to School Support Program in the <i>Countywide Implementation</i> chapter of the countywide plan.
<b>Safety and Enforcement</b>	
Law Enforcement for Pedestrian Safety	Coordinate with NVTA to provide resources to officers in American Canyon on pedestrian safety enforcement principles and education outreach efforts to align with Countywide collision reduction goals. Consider designating traffic safety officers who conduct pedestrian related enforcement activities, such as monitoring school circulation activity during pick up and drop off periods. Determine feasibility of enforcement recommendations in <i>Countywide Implementation</i> chapter of the countywide plan.
NVTA Safety Campaign	Coordinate with NVTA on the media safety campaign that NVTA is pursuing, as an opportunity for education by distributing pedestrian safety pamphlets in-lieu of, or in addition to, citations.
<b>Maintenance</b>	
Repair of Sidewalks, Crosswalks, and Curb Ramps	<ul style="list-style-type: none"> <li>• Continue to regularly improve and repair uneven sidewalk, broken asphalt in crosswalks, and install new curb ramps as part of the Citywide Sidewalk Maintenance Program in Table AC-5. This effort could complement the update schedule for curb ramps and sidewalks in the ADA Transition Plan and/or a trip and fall monitoring program.</li> <li>• Determine feasibility of adding a page to the city’s website to allow residents and visitors to more easily report and track hazards in the public right-of-way and to ensure all necessary sidewalk repairs are included in the City’s Capital Improvement Program (CIP). This could be coordinated with use of the “SeeClickFix” app to report maintenance needs for pedestrian-related pavement markings and traffic control devices.</li> </ul>

**TABLE AC-6: AMERICAN CANYON PROGRAM AND POLICY RECOMMENDATIONS**

Program or Policy	Recommendations
Overgrown Vegetation on Sidewalks and Planting Strips	Continue to ensure citywide that landscapes at maturity do not interfere with safe sight distances for bicycle, pedestrian, or vehicular traffic; do not conflict with overhead lights, traffic controls, traffic signage, utility lines or poles, or walkway lights; and, do not block bicycle or pedestrian ways. Develop ordinance to encourage adjacent property owners to maintain landscaped areas with live and healthy plant materials, replace plant materials when necessary to maintain full function and aesthetics; to water, weed, prune, fertilize and keep sidewalks and planting strips litter free.
<b>Engineering and Design Standards</b>	
ADA Compliance Tracking Program	Determine feasibility of tracking ADA improvements and updates using practices recommended as part of the ADA Transition Plan update, to be coordinated by the ADA Coordinator. Maintain and update GIS database of ADA curb ramps and sidewalk in the public-right-of way to align with priority schedule in the updated ADA Transition Plan.
Crosswalk Guidelines	Implement Crosswalk Guidelines, included in Appendix D of the Countywide Pedestrian Plan, to enable the city to respond to crosswalk requests in a manner that improves pedestrian accessibility and maintains public safety. Reference Guidelines when making decisions about where standard crosswalks (two, parallel white stripes) can be marked; where crosswalks with special treatments, such as high-visibility crosswalks, flashing beacons and other special features, should be employed; and where crosswalks will not be marked due to safety concerns resulting from volume, speed, or sight distance issues.
<b>Place Making and Complete Streets</b>	
Site Plan Review Checklist	Create checklist for development review to ensure site plans include considerations for pedestrian access, safety and sidewalk activation (including considerations for building frontage location, pocket parks, small plazas, or mini shops and evaluation of pedestrian circulation in parking lots). Include items from MTC’s Routine Accommodation Checklist for projects in the public right-of-way to ensure routine application of the Complete Streets policy. MTC’s checklist can be found here: <a href="http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf">http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf</a>

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## Next Steps

### Funding Sources

According to American Canyon staff, funding is the greatest obstacle to implementing pedestrian projects. For example, there is no specific funding source set aside for the Traffic Calming Program. While sidewalk projects do not have a set annual budget, they tend to comprise approximately \$100,000 of the annual capital improvements program funding. The majority of sidewalk projects in the city are funded through grants in addition to local funds.

Federal, state, regional, county and local organizations provide funding for pedestrian and bicycle projects and programs. The most recent Federal surface transportation funding program, Fixing America's Surface Transportation Act (FAST Act), was signed into law in July 2012. Details in this section are provided for funding programs that are used to fund scheduled projects through December 2020.

FAST Act funding is distributed to Federal and state surface transportation funds. Most of these resources are available to American Canyon through Caltrans, the Metropolitan Transportation Commission (MTC), and the Napa Valley Transportation Authority (NVTA).

**Table AC-7** summarizes the applicability of these various funding sources to projects, planning efforts, and programs proposed in this plan. Detailed descriptions of the grant funding sources are presented in **Appendix B** of the countywide plan. The most applicable funding sources for the improvements recommended by this plan are the Active Transportation Program, One Bay Area Grants, and Highway Safety Improvement Program, and Transportation Development Act Article 3 funds.

TABLE AC-7: REGIONAL FUNDING SOURCE APPLICABILITY MATRIX				
Funding Source	Class I Multi-Use Path	Pedestrian Projects	Other Projects	Planning and Programs
Highway Safety Improvement Program (HSIP) Grants	◐	●	●	○
Caltrans Transportation Planning Grants	○	○	○	●
Local Transportation Fund (LTF)	●	●	●	○
California State Parks Recreational Trails Program (RTP)	●	○	○	○
Land and Water Conservation Fund (LWCP)	●	○	○	○
Active Transportation Program (ATP), including Safe Routes to School	●	●	●	●
Transportation Development Act Article 3 (TDA-3)	●	●	●	◐
One Bay Area Grant (OBAG)	●	●	●	●
Bay Area Air Quality Management District (BAAQMD) Transportation Fund for Clean Air	◐	◐	◐	○

Notes:

1. ● indicate that funds may be used for this category; ○ indicate that funds may not be used for this category, and ◐ indicate that funds may be used, though restrictions apply.

Source: Fehr & Peers, 2016.

### Cost of the Pedestrian Network

**Table AC-8** presents unit costs for standard pedestrian treatments, estimated using an ATP Cost Estimating Tool developed for the Alameda County Transportation Commission. The tool is used to estimate costs for bicycle and pedestrian projects at the network planning scale during the development of active transportation plans and in a sketch-planning capacity for a bicycle and/or pedestrian project. The costs shown represent the total construction for a typical treatment of that type, including engineering, design, construction management, mobilization, traffic control and general contingency. Contingency for drainage and utility relocation was also included for relevant treatment types, such as curb extensions. These numbers do not include right-of-way costs or inflation.

**TABLE AC-8: GENERALIZED UNIT COSTS FOR IMPROVEMENTS**

Facility Type	Cost	Unit
Curb Extension/Bulbout	\$56,000	Each
Pedestrian Refuge Island	\$10,000	Each
Flashing Beacons (RRFBs)	\$45,000	Per Crosswalk
Pedestrian Hybrid Beacon (PHB)	\$144,000	Per Crosswalk
Customized Pedestrian Wayfinding Signs	\$2,000	Per Sign

1. Costs reflect capital costs plus contingency for engineering design, environmental, construction management, mobilization, traffic control, and contingency.

Source: Fehr & Peers, ATP Cost Estimating Tool, 2016.

Project-level cost estimates were prepared for Tier One projects determined in the previous section of this plan, while the remaining projects were assigned a ranking in Table AC-5 to indicate an estimated range of cost level. Prepared cost estimates, included in **Appendix AC-D**, include unit costs for individual improvements within the project and adjustments to account for traffic control, construction management, and mobilization. Additional factors were also used for overall contingency, engineering design and environmental. A summary of the estimates is shown in **Table AC-9** below.

**TABLE AC-9: TIER ONE PROJECT SUMMARY COSTS**

Project	Total Cost <sup>1</sup>
AC-2: SR 29 Traffic Calming and James Road Sidewalks	\$1,035,000
AC-3: Donaldson Way Improvements	\$570,900
AC-4: Safe Routes to School Improvements	\$356,600

1. Costs reflect capital costs plus contingency for engineering design, construction management, mobilization, traffic control, and contingency.

Source: Fehr & Peers, ATP Cost Estimating Tool, 2016.

Note: For an estimated cost for the SR 29 Pedestrian Crossings (AC-7), which was developed through separate planning efforts, please refer to the Countywide Plan Vision 2040.

## Countywide Performance Metrics and Evaluation

NVTA intends to monitor progress on the implementation of this plan over time. The *Countywide Implementation* chapter of the Countywide Pedestrian Plan summarizes key performance goals and associated metrics for this plan’s implementation.

## American Canyon Appendix

AC-A Benchmarking Table

AC-B Existing Pedestrian Policies

AC-C Detailed Project Lists and Prioritization

AC-D Cost Estimates

AC-E Plan Adoption Resolution

# Appendix AC-A: Benchmarking Table

AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>ADA Transition Plan</b></p> <p>Compliance with the Americans with Disability Act (ADA) guidelines is important not only to enhance community accessibility, but also to improve walking conditions for all pedestrians.</p> <p>An ADA Transition Plan sets forth the process for bringing public facilities into compliance with ADA regulations.</p>	Key Strength	<p>American Canyon uses Caltrans standards for ADA curb ramps, which require curbs with grooves facing towards the center of the intersection at all street crossings and curb returns. The standards do not include truncated domes or directional curb ramps.</p> <p>The city has an ADA Transition Plan from 2008 that includes an inventory of needed improvements for deficient sidewalks and curb ramps in the public right-of-way along priority corridors.</p>	<ul style="list-style-type: none"> <li>Consider tracking ADA improvements using practices recommended in ADA Transition Plan, updated as part of this plan, to be implemented by the ADA Coordinator</li> <li>Implement directional curb ramps where practical and truncated domes in all cases. Review and revise standard drawings to align with PROWAG recommendations.</li> </ul>
<p><b>Traffic Calming Programs</b></p> <p>Traffic Calming Programs and policies set forth a systematic and consistent approach for addressing neighborhood requests and approvals, as well as standard treatments and criteria.</p>	Key Strength	<p>American Canyon has a Traffic Calming Program that outlines the steps for a community interested in traffic calming, defines the various traffic calming options and appropriate uses, and establishes guidelines for installing the traffic calming measures. There is no specific funding set aside for these improvements.</p>	<ul style="list-style-type: none"> <li>Include a line item in the annual budget to create a formal Neighborhood Traffic Management Program (NTMP) to allow additional traffic calming implementation and an inventory of improvements.</li> <li>Encourage the routine use of traffic calming measures beyond speed humps.</li> </ul>
<p><b>Complete Streets Policy</b></p> <p>Routine Accommodations or Complete Streets Policies accommodate all modes of travel and travelers of all ages and abilities.</p>	Key Strength	<p>The city's Complete Streets policy, adopted in 2012, includes principles, implementation strategies, and exemptions from complete streets requirements. As part of implementation, the City of American Canyon Open Space Advisory Committee, serving as the city's Bicycle and Pedestrian Advisory Committee per Resolution 2010-115, reviews transportation projects to provide recommendations regarding Complete Streets.</p> <p>Routine data collection is also required to evaluate how well all users are being served by the transportation network.</p>	<ul style="list-style-type: none"> <li>Consider maintaining a GIS database for data collected as part of the policy evaluation, to include pedestrian volumes collected in this plan.</li> <li>Develop a checklist for project review to ensure routine application of the Complete Streets policy.</li> <li>Consider using multi-modal level of service criteria.</li> </ul>



AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Public Involvement</b></p> <p>Responding to public concerns through public feedback mechanisms represents a more proactive and inclusive approach to pedestrian safety compared to a conventional approach of reacting to pedestrian collisions. Advisory committees serve as important sounding boards for new policies, programs, and practices. A citizens’ pedestrian advisory committee is also a key component of proactive public involvement for identifying pedestrian safety issues and opportunities.</p>	Key Strength	<p>American Canyon residents (or visitors) may file requests for safety improvements on city streets via phone or email. Additionally, the city’s “SeeClickFix” app allows people to report non-emergency issues on a web-based map of the city. Residents can submit information directly to the city regarding damaged sidewalk, deficient lighting, or other non-emergency issues.</p> <p>Public involvement occurs through several groups including the Parks and Community Services Commission, the Open Space Advisory Committee (OSAC), and stakeholders from the Senior Center. The OSAC serves as the city’s Bicycle and Pedestrian Advisory Committee per Resolution 2010-115, and is involved with site plan review and the review of transportation projects to provide Complete Streets recommendations.</p>	<ul style="list-style-type: none"> <li>Consider adding a page to the city’s website dedicated to receiving public input regarding transportation issues and a subsection for pedestrian topics. This category or subcategory may allow residents to file comments or complaints for traffic control devices or dangerous conditions. Encourage broad use of the “SeeClickFix” app for pedestrian issue and opportunity input.</li> <li>Consider creating a formal Active Transportation Advisory Committee (ATAC) for city-specific issues. This Committee could include the American Canyon representative on the ATAC for NVTAs.</li> <li>Consider organizing neighborhood groups that identify street needs, including greening and traffic calming.</li> </ul>
<p><b>Pedestrian Volumes</b></p> <p>Pedestrian volume data is important for prioritizing projects, developing collision rates, and determining appropriate pedestrian infrastructure.</p>	Enhancement	<p>While American Canyon has collected pedestrian and bicycle counts for some projects, the city does not regularly collect pedestrian or bicycle counts, nor does it require that bicycle or pedestrian counts be collected with manual intersection counts.</p>	<ul style="list-style-type: none"> <li>Use collected volumes in this plan to identify pedestrian nodes in the next update to the General Plan</li> <li>Routinely collect pedestrian volumes with all transportation impact studies (TIAs).</li> <li>Geo-code existing and future pedestrian volume data with GIS software along with other data such as pedestrian control devices and collisions to analyze data for trends or hotspots related to pedestrian safety.</li> </ul>
<p><b>Speed Surveys and Speed Limits</b></p> <p>Pedestrian fatality rates increase exponentially with vehicle speed. Thus, reducing vehicle speeds in pedestrian zones may be one of the most important strategies for enhancing pedestrian safety.</p>	Enhancement	<p>In American Canyon, speed surveys are conducted in response to reported concerns, frequent collisions, or at the request of citizens or the Napa County Sheriff’s deputies, who patrol the streets in the city.</p>	<ul style="list-style-type: none"> <li>Proactively consider pedestrian volumes when setting speed limits.</li> <li>Explore the use of reduced speed limits in school zones.</li> <li>Ensure design standards in pedestrian areas do not contribute to a routine need for traffic calming.</li> </ul>

AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Identifying Crossing Barriers</b></p> <p>Crossing barriers such as railroads, freeways, and major arterials may discourage or even prevent pedestrian access. Additionally, crossing barriers are often associated with vehicle-pedestrian collisions. Identifying barriers and developing alternate methods of crossing or improving designated crossings, as well as preventing new barriers, is essential for improving walkability and pedestrian safety.</p>	Enhancement	American Canyon does not have a policy in place for identifying pedestrian barriers, but city staff listed several barriers, including SR 29, the California Northern railroad, running parallel to SR 29 from south city limits to Napa Junction Rd. and continuing to the west north of City Hall, and American Canyon Creek running through the Vintage Ranch neighborhood. The Vine Trail efforts include looking for opportunities to reduce those barriers through additional crossings, and a project to identify three overcrossings over SR 29 on the 2015 Napa Countywide Transportation Plan Unconstrained Project List addresses that barrier indirectly.	<ul style="list-style-type: none"> <li>Identify and create a comprehensive inventory of pedestrian barriers, along with appropriate remedies or projects.</li> </ul>
<p><b>Design and Development Standards</b></p> <p>Design policies and development standards can improve the pedestrian walking experience, encourage walking, enhance economic vitality, and offer funding opportunities for pedestrian improvements.</p>	Enhancement	American Canyon does not have citywide design recommendations outside of this plan for walking facilities. Several local plans, including the Watson Ranch Specific Plan Draft (2014) and the county-generated plan for SR 29, do support pedestrian connectivity.	<ul style="list-style-type: none"> <li>Use elements of the design guidelines presented in this plan as part of the development review process.</li> <li>Develop a Streetscape Master Plan for the city.</li> </ul>
<p><b>Bicycle Parking Ordinance</b></p> <p>Bicyclists become pedestrians after parking their bicycles. Safe and convenient bicycle parking is essential for encouraging bicycle travel (especially in lieu of vehicle travel).</p>	Enhancement	American Canyon’s municipal code has a bicycle parking requirement for commercial and employment areas. According to the municipal code, “bicycle parking should be located in highly visible locations and should be lockable.” <sup>1</sup>	<ul style="list-style-type: none"> <li>Consider modifying the bicycle parking ordinance to distinguish and provide for both long-term and short-term bicycle parking. Include requirements for rack placement to ensure a convenient location and a adequate pedestrian clearances.</li> </ul>

<sup>1</sup> American Canyon Municipal Code, 19.21.050 Bicycle parking requirements: <http://qcode.us/codes/americancañon/>



AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Pedestrian Safety Education Program</b> Education is a critical element for a complete and balanced approach to improving pedestrian safety. Education campaigns may target pedestrians of all ages.</p>	Enhancement	<p>In accordance with policies in the Napa Bike Plan and the General Plan, NVTa is planning to pursue grant funding through the California Office of Traffic Safety (OTS) for a media safety campaign for motorists. The campaign will use Pittsburgh’s Drive With Care campaign for inspiration, which characterizes bicyclists and pedestrians as our firefighters, doctors, and neighbors and uses the slogan “someone you care about rides a bike”. The OTS will release a call for projects around November 2015 for their 2017 funding cycle.</p>	<ul style="list-style-type: none"> <li>• Coordinate with NVTa on pursuing a media safety campaign, and consider the following methods to distribute the campaign in American Canyon:                             <ul style="list-style-type: none"> <li>○ Include advertisements on buses and bus shelters, through SRTS and in-school curriculum, community school courses, public service announcements, and/or brochures distributed by law enforcement, among many other strategies.</li> </ul> </li> <li>• Pedestrian safety brochures could be distributed to the public independent of the media campaign to promote walking to city events.</li> </ul>
<p><b>Institutional Coordination</b> Institutional issues for pedestrian planning/design may refer to adopted or informal impediments. This may be policies, practices, funding issues or even stakeholders that make it challenging to improve walking in American Canyon.  Institutional coordination associated with multiple agencies is necessary because of non-local control of right-of-way and differing policies regarding pedestrian accommodation.</p>	Enhancement	<p>American Canyon shares jurisdiction over components of the transportation network with Caltrans.  The city’s working relationship with Caltrans was a challenge in the past, but it has been improving in recent years. The city has also coordinated effectively with area schools to pursue Safe Routes to School grants.  According to staff, funding is the biggest obstacle the city faces in project implementation.</p>	<ul style="list-style-type: none"> <li>• Continue to seek opportunities to collaborate with local transit agencies to improve pedestrian safety around transit stops.</li> <li>• Proactively seek opportunities to collaborate with Caltrans and/or local jurisdictions to improve pedestrian safety along SR 29.</li> <li>• Reference the public involvement, analysis, and prioritization efforts of this plan when applying for grants to fund the top projects</li> </ul>

AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Safe Routes to School</b></p> <p>Safe-Routes-to-School (SRTS) programs encourage children to safely walk or bicycle to school. The programs are important both for increasing physical activity (and reducing childhood obesity) and for reducing morning traffic associated with school drop-off. Funding for educational programs and/or infrastructure projects is available at the state and federal levels.</p>	<p>Enhancement</p>	<p>The Napa County Office of Education (NCOE) currently has a three year grant to administer a Safe Routes to School (SRTS) Program across the county through 2016. Program leaders have a goal of reaching every interested school by the end of the grant term, and plan to work with Canyon Oaks Elementary School and Donaldson Way Elementary School in 2015.</p> <p>The program includes events such as Walk and Roll to School Day, Bike Rodeos, and Safe Walking education presentations for students in grades K-3. Brochures are handed out during this program as well as at community events and PTA/parent meetings. Parent presentations include a review of pedestrian laws and ordinances.</p> <p>Although materials for these programs are available each year for schools across the county, reaching schools on a weekly or yearly basis has not been possible due to understaffing and scarcity of volunteers.</p> <p>The American Canyon Public Works Department created a map of suggested routes to American Canyon High School in 2010 that includes American Canyon transit stop locations.</p>	<ul style="list-style-type: none"> <li>• Pursue SRTS grant funding for pedestrian infrastructure projects.</li> <li>• Seek partners to form school-specific committees of community agencies, parents, advocates, city staff, community health representatives, and other stakeholders to administer SRTS programs at each school in American Canyon. Hold regular meetings to maintain stakeholder involvement.</li> <li>• Use distances from schools from parent survey results to determine feasibility of rolling out Walking School Bus program for schools in Napa.</li> <li>• Coordinate with NVTa to seek additional funding for SRTS.</li> </ul>
<p><b>Collision Reporting</b></p> <p>Identifying and responding to collision patterns on a regular basis is an important reactive approach to pedestrian safety (which may be combined with proactive measures).</p>	<p>Opportunity</p>	<p>American Canyon does not have a regular practice of reviewing collision data. Engineering staff review collision reports as needed on a case-by-case basis. City engineers previously received regular reports from SWITRS, but this data now goes straight to the Police Department.</p>	<ul style="list-style-type: none"> <li>• Geo-coding (mapping) and comprehensive monitoring using Crossroads software would allow for more proactive pedestrian safety projects and best practices such as collision typing for countermeasure selection. GIS efforts may be funded through an Office of Traffic Safety grant.</li> <li>• Pedestrian volume data could be used to prioritize collision locations based on collision rates (collisions/daily pedestrian volume). This could lead to a proactive approach to identify treatments and program city CIP funding. Volunteers can collect pedestrian volumes and other data at collision locations.</li> </ul>



AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Pedestrian-Oriented Traffic Warrants / Traffic Control Devices</b></p> <p>Providing all-way stop or signal control at an intersection may improve pedestrian safety by reducing speeds and controlling pedestrian-vehicle conflicts. The MUTCD defines warrants for installing signals and stop signs.</p> <p>The 2014 California <i>Manual of Uniform Traffic Control Devices</i> (MUTCD) requires the installation of countdown pedestrian signals for all crosswalks at new or modified signals where the pedestrian interval is more than 7 seconds.</p> <p>Leading Pedestrian Intervals (LPIs) can reduce conflicts between turning vehicles and pedestrians by providing pedestrians with a “head start” signal timing before vehicles on the parallel street are allowed to proceed through an intersection.</p>	Opportunity	<p>American Canyon follows MUTCD requirements for both stop sign and signal warrants. Additionally, there are some all-way stop control intersections in American Canyon that were based on engineering judgment rather than MUTCD recommendations.</p> <p>There is not a comprehensive inventory of signs, markings, and signals in American Canyon. Partial inventories are available through specific projects.</p> <p>American Canyon does not have any LPIs installed.</p>	<ul style="list-style-type: none"> <li>Consider developing city-specific signal and stop sign warrants that are pedestrian friendly for locations where pedestrian safety is a concern. Best practices for stop-sign warrant application include: <ul style="list-style-type: none"> <li>Requiring a collision history of three instead of five years based on routine underreporting</li> <li>Reducing traffic volume thresholds based on latent demand</li> <li>Providing consideration for school children, pedestrians and traffic speeds</li> </ul> </li> <li>Expand the GIS-based inventory created with this plan to include pedestrian-related markings and traffic signals with pedestrian facilities</li> <li>Consider installing LPIs in areas where vehicle yielding may be an issue, providing a right-turn-on-red restriction as necessary per recent research findings<sup>2</sup>.</li> </ul>
<p><b>Inventory of Pedestrian Facilities</b></p> <p>A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc.</p>	Opportunity	<p>The city does not have a GIS inventory of sidewalks or other pedestrian facilities, although developments built after 1996 all have sidewalks (often only one side of the street).</p> <p>While sidewalk projects do not have a set annual budget, they tend to comprise approximately \$100,000 of the annual capital improvements program funding. The majority of sidewalk projects in the City are funded through grants in addition to local funds.</p>	<ul style="list-style-type: none"> <li>Expand the GIS-based facility inventory, created as part of this plan, to include informal pathways and key pedestrian opportunity areas in the city.</li> </ul>

<sup>2</sup> Hubbard, S, Bullock, D and J. Thai, Trial Implementation of a Leading Pedestrian Interval: Lessons Learned, ITE Journal, October 2008, pp. 32-41.

AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Walking Audit Program</b></p> <p>Walking audits provide an interactive opportunity to receive feedback from key stakeholders about the study area as well as discuss potential solutions and their feasibility.</p>	Opportunity	American Canyon has not conducted pedestrian walking audits before this plan.	<ul style="list-style-type: none"> <li>Conduct regular walking audits as part of a citywide safety program for pedestrians. This effort could complement a “trip and fall” program or health-oriented programs within the City, as well as distribution of the media campaign NVTA is pursuing.</li> </ul>
<p><b>Crosswalk Design Guidelines</b></p> <p>A formal policy for crosswalk installation, removal, and enhancement provides transparency in decision-making and creates a consistent application of treatments citywide.</p>	Opportunity	The city currently does not have a crosswalk policy and makes decisions regarding crosswalks on a case by case basis.	<ul style="list-style-type: none"> <li>Consider adopting a crosswalk policy as part of this plan that reflects best practices and recent research to include criteria for installing crosswalk enhancements such as flashing beacons, advanced yield markings, or in-roadway pedestrian signs.</li> <li>Include criteria in the crosswalk policy for identifying, installing, and enhancing midblock crossings where strong desire lines exist.</li> </ul>
<p><b>General Plan</b></p> <p>Planning principles contained in a city’s General Plan can provide an important policy context for developing pedestrian-oriented, walkable areas. Transit-oriented development, higher densities, and mixed uses are important planning tools for pedestrian-oriented areas. A city’s General Plan is also a key opportunity to establish the framework for pedestrian orientation. The Circulation Element of the General Plan typically assigns roadway typologies, which can include a layered network approach with prioritized corridors for transit, pedestrian, bicycle, and auto travel.</p>	Opportunity	<p>According to the General Plan, residential densities in American Canyon are allowable up to 10-20 dwelling units/acre. There are currently some areas of three-story residential development, and new four-story residential buildings have been approved but not built. Density is concentrated along SR 29, although the Watson Ranch development will also have higher density. The city does allow for both vertical and horizontal mixed-use (only horizontal mixed-use has been built).</p> <p>American Canyon does not officially designate pedestrian nodes, but staff identified a pedestrian node in the commercial district of American Canyon at the Walmart, a park, and a cluster of several other stores. This node is part of a Priority Development Area (PDA) which will eventually have more transit via enhanced bus service. Developments at Watson Ranch, the industrial development south of the Airport, and the former Eucalyptus Grove area will also have higher density and the potential to become pedestrian nodes.</p>	<ul style="list-style-type: none"> <li>Identify pedestrian nodes in future updates to the General Plan</li> <li>Consider defining opportunities for mixed-uses by ordinance, particularly in pedestrian priority areas identified in this plan. Identify future priority areas in the city where varied densities could accommodate or attract pedestrian activity.</li> <li>Consider relaxing auto Level of Service standards in pedestrian-oriented overlay zones that align with focus areas in this plan, and prioritizing sidewalk improvement projects in these areas.</li> </ul>



AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Historical Preservation</b></p> <p>Historic walking routes, such as the famous Freedom Trail in Boston, encourage walking and enhance economic vitality.</p>	Opportunity	The ruins of the Standard Portland Cement Company plant, while not eligible for the National or California Historic Register, are locally recognized in American Canyon. The site is part of a preservation plan within the Watson Ranch Specific Plan Draft. The plan proposes a mix of preservation approaches, including rehabilitation, alteration, addition, selective demolition, stabilization, and converting the uses to a winery, chapel, event space, farmers’ market, and beer garden.	<ul style="list-style-type: none"> <li>Develop a map to showcase natural or local sites of interest, including the Portland Cement plant, with a possible walking route between the sites. Maps of the tour route and historic documentation materials could be made available online and way-finding signs, maps, and plaques could also be provided throughout the city.</li> </ul>
<p><b>Newspaper Rack Ordinance</b></p> <p>Newspaper racks may obstruct walkways and reduce accessibility and pedestrian visibility when ordinances are not in place. A Newspaper Rack Ordinance improves the pedestrian realm by reducing clutter and organizing sidewalk zones and may detail size, location, and maintenance requirements.</p>	Opportunity	American Canyon’s Municipal Code does not include a newspaper rack ordinance.	<ul style="list-style-type: none"> <li>Consider adopting a Newspaper Rack Ordinance that specifies the number and location of allowable newspaper racks and ensures the maintenance of a clear pedestrian sidewalk area.</li> </ul>
<p><b>Sidewalk or Street Furniture Ordinance</b></p> <p>Street furniture encourages walking by accommodating pedestrians with benches to rest along the route or wait for transit; trash receptacles to maintain a clean environment; street trees for shade, etc. Uniform street furniture requirements also enhance the design of the pedestrian realm and may improve economic vitality.</p>	Opportunity	American Canyon’s Municipal Code does not include street furniture requirements.	<ul style="list-style-type: none"> <li>Consider adopting a Street Furniture Ordinance to include guidance for the design of transit stops and locations for additional street furniture amenities, other than those associated with transit stops, as appropriate.</li> </ul>

AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Street Tree Ordinance</b></p> <p>Street trees enhance the pedestrian environment by providing shade and a buffer from vehicles. Street trees may also enhance property values, especially in residential neighborhoods. However, street trees, when improperly selected, planted, or maintained, may cause damage to adjacent public infrastructure and/or utilities.</p>	Opportunity	American Canyon does not have a street tree ordinance.	<ul style="list-style-type: none"> <li>Consider adopting a Street Tree Ordinance including all development types, that specifies where and how often street trees may be planted/ replaced, and which types of trees are appropriate.</li> </ul>
<p><b>Open Space Requirements</b></p> <p>Residents typically rate open space as among a jurisdiction's key assets and needs. Open space may encourage walking, especially for recreational trips.</p>	Opportunity	American Canyon does not have an open space requirement, but subdivision requirements do contain park dedication requirements.	<ul style="list-style-type: none"> <li>Consider open space requirements that include provisions for pedestrian safety and accessibility.</li> <li>Consider modifying subdivision requirements to include pedestrian provisions in park requirements.</li> </ul>
<p><b>Transportation Demand Management</b></p> <p>Transportation Demand Management (TDM) programs encourage multi-modal travel by incentivizing non-auto options. As new development occurs, TDM programs can be expanded, formalized, and strengthened.</p>	Opportunity	<p>Employers of 50 or more full-time workers in the Bay Area are required to provide commuter benefits to their employees through the Bay Area Commuter Benefits Program, to comply with California SB 1339. The Program includes benefit options like transit passes, employer-provided shuttles, and vanpool subsidies.</p> <p>Additionally, the NVTA has a contract with an agency in Solano to facilitate rideshare matching.</p>	<ul style="list-style-type: none"> <li>As part of a comprehensive TDM program for American Canyon:                             <ul style="list-style-type: none"> <li>Hire or identify a part-time TDM Coordinator</li> <li>Create a TDM program and a accompanying website with separate pages for employees, residents, and visitors.</li> <li>Develop a TDM policy which:</li> </ul> </li> <li>Support the "Car Free" tourism program of the Napa Valley Destination Council and NVTA, which provides information to visitors so they can plan a trip without relying solely on a car</li> </ul>



AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Economic Vitality</b>                      Improving pedestrian safety and walkability can enhance economic vitality. Similarly, enhancing economic vitality through innovative funding options such as Business Improvement Districts (BIDs), parking management, and facade improvement programs can lead to more active pedestrian areas and encourage walking.</p>	Opportunity	American Canyon does not have a BID, façade improvement program, or Downtown Parking District.	<ul style="list-style-type: none"> <li>Consider establishing Business Improvement Districts that can fund streetscape and pedestrian improvements.</li> <li>Consider implementing a façade improvement program.</li> </ul>
<p><b>Coordination with Health Agencies</b>                      Involving non-traditional partners such as public health agencies, pediatricians, etc., in the planning or design of pedestrian facilities may create opportunities to be more proactive with pedestrian safety, identify pedestrian safety challenges and education venues, and secure funding.                      Additionally, under-reporting of pedestrian-vehicle collisions could be a problem that may be partially mitigated by involving the medical community in pedestrian safety planning.<sup>3</sup></p>	Opportunity	<p>Live Healthy Napa County, a coalition of local community stakeholders for improving health in Napa County, recently completed the Napa County Community Health Improvement Plan (CHIP) in February 2014. The document proposes a plan to address health issues through new policies and health promotion strategies, including transportation policies that encourage walking and biking.</p> <p>American Canyon does not coordinate with health agencies or professionals in the planning and design of pedestrian facilities.</p> <p>Live Healthy Napa County completed the first ever Napa County Community Obesity Prevention Plan (Jan. 2015)<sup>4</sup>, which addresses the need to increase active transportation options countywide.</p>	<ul style="list-style-type: none"> <li>Seek opportunities to meet goals in the CHIP related to active transportation, such as improving the built environment by including additional pedestrian infrastructure projects in the city's Capital Improvement Program (CIP).</li> <li>Involve the emergency response community in pedestrian planning to encourage complete reporting of pedestrian-vehicle collisions</li> <li>Involve health professionals in the development review process, especially related to active transportation improvements.</li> <li>Ensure consistency with the CHIP by seeking partnership opportunities between health agencies and Safe Routes to School to expand the reach of education and promotion of walking.</li> </ul>

<sup>3</sup> Sciortino, S., Vassar, M., Radetsky, M. and M. Knudson, "San Francisco Pedestrian Injury Surveillance: Mapping, Underreporting, and Injury Severity in Police and Hospital Records," *Accident Analysis and Prevention*, Volume 37, Issue 6, November 2005, Pages 1102-1113

<sup>4</sup> [http://www.livehealthynapacounty.org/uploads/5/1/4/4/51449431/napa\\_county\\_community\\_obesity\\_prevention\\_plan\\_\(final\).pdf](http://www.livehealthynapacounty.org/uploads/5/1/4/4/51449431/napa_county_community_obesity_prevention_plan_(final).pdf)

AMERICAN CANYON PROGRAMS, POLICIES, AND PRACTICES BENCHMARKING ANALYSIS			
Plans, Policies, & Programs	Benchmark	American Canyon Current Practice	Best Practice Examples
<p><b>Law Enforcement</b></p> <p>Enforcement of pedestrian right-of-way laws and speed limits is an important complement to engineering treatments and education programs.</p>	Opportunity	<p>The American Canyon Police Department has an active Citizen Volunteer Program, which consists of local citizen volunteers that assist the Department at Elementary Schools and with the Radar Trailer Program. There are also 2 officers assigned to motorcycles for traffic education and enforcement, as well as a community resource officer and an officer assigned to the high school. To date, law enforcement has not tracked pedestrian-involved collision trends to relate them to enforcement efforts.</p>	<ul style="list-style-type: none"> <li>• Implement sustained pedestrian safety enforcement efforts and involve the media. Coordinate with NVT A on the media campaign that is being pursued, as an opportunity for education by distributing pedestrian safety pamphlets in-lieu of, or in addition to, citations.</li> <li>• Coordinate with NVT A to provide resources to officers on pedestrian safety principles/best practices and education outreach efforts.</li> <li>• Consider designating traffic safety officers who conduct pedestrian related enforcement activities, such as monitoring school circulation activity.</li> <li>• Consider tracking pedestrian-involved collisions aligned with enforcement efforts to analyze trends.</li> </ul>
<p><b>Coordination with Emergency Response and Transit Providers</b></p> <p>Emergency response vehicles require special roadway design considerations that sometimes conflict with bicycle and pedestrian treatments. For example, while pedestrians benefit from reduced speeds of smaller curb radii, larger vehicles such as fire trucks and buses have more difficulty performing the turn within the smaller space. These conflicts require consensus building between the city and the respective departments.</p>	Opportunity	<p>There is minimal coordination between transit planning and pedestrian planning in American Canyon, and the fire department is not involved in pedestrian projects.</p>	<ul style="list-style-type: none"> <li>• Seek opportunities for technical collaboration and funding with first responders and transit providers.</li> <li>• Consider pilot testing programs for transit and emergency response and a more active involvement in project review for small projects and not just development projects.</li> <li>• Explore ways to implement a Safe Routes to Transit Program that prioritizes bike and pedestrian access to major transit connection points and transit centers.</li> </ul>



# Appendix AC-B: Existing Pedestrian Policies

The City of American Canyon has adopted policies as part of its general plan in support of walking. Most such policies appear in the circulation element of the general plan. Additional supportive policies appear in the land use and the parks and recreation elements. These policies typically express support for making walking safer, more convenient and more pleasant.

## American Canyon General Plan

### Circulation Element (2011)

- Policy 1.5 Neighborhood Context. Support safe, complete and well-connected neighborhood street, bicycle, and pedestrian access and connections ... (page 17)
- Policy 1.7 Complete Streets. Maintain and update street standards that provide for the design, construction, and maintenance of “Complete Streets.” The City’s Complete Streets shall enable safe, comfortable, and attractive access for all users: pedestrians, motorists, bicyclists, and transit riders of all ages and abilities ... (17)
- Policy 1.19 Complete Streets: When construction or modifying transportation facilities, consistent with Resolution 2012-72, “Complete Streets Policy of the City of American Canyon”, strive to provide for the movement of ... and pedestrians appropriate for the road classification and adjacent land use. (20)
  - Evaluate projects to ensure that the safety, comfort, and convenience of pedestrians, bicyclists and transit users are given equal level of consideration to motor vehicle operators.
  - Improve the existing street network to minimize travel times and improve mobility for transit, bicycle, and walking trips between new projects and surrounding land uses to reduce vehicle trips.
- Policy 1.20 Neighborhood Context. Plan for safe, complete, well connected neighborhood streets. (21)
  - Modify the existing street network, where possible, to enable direct physical connections within and between neighborhoods, neighborhood-commercial areas, and commercial-commercial areas, including connections accessible only by pedestrians and bicycles on existing cul-de-sac streets.
  - Where feasible, provide pedestrian crosswalks on all intersection approaches.
  - Implement an ADA Transition Plan that focuses on compliant sidewalk improvements that provide continuous pedestrian and wheelchair access where compatible with the surrounding area.
  - Develop and implement a Pedestrian Master Plan (PMP) that indicates which streets in addition to arterials and collectors will install sidewalks and what other pedestrian facilities and amenities (such as ‘resting spots’) are needed to complete the pedestrian network. Sidewalk widths and shade



coverage should also be addressed in the context of the adjacent land use, vehicle volumes, and vehicle speeds.

- Policy 1.35 General transit and pedestrian access. In reviewing designs of proposed developments, ensure that provision is made for access to current and future public transit services. In particular, pedestrian access to arterial and collector streets from subdivisions should not be impeded by continuous segments of sound walls. (25)
- Policy 2.1 Promote walking and bicycling. Promote walking and bike riding for transportation, recreation, and improvement of public environment and health. (29)
- Policy 2.2 Meet the needs of all users. Recognize and meet the mobility needs of persons using wheelchairs and those with other mobility limitations. (29)
- Policy 2.3 Develop a safe and efficient non-motorized circulation system. Provide safe and direct pedestrian routes and bikeways between places. (29)
- Policy 2.6 Street trees for shade and comfort. Ensure that planting plans for street trees take into consideration shade and comfort for pedestrians and bicyclists and traffic calming benefits.
- Policy 2.7 Universal design. Provide pedestrian facilities that are acceptable to persons with disabilities and ensure that roadway improvement projects address accessibility by using universal design concepts. (30)
- Policy 2.17 Pedestrian access to shopping destinations. Install clearly marked crosswalks at intersections near all commercial uses, as well as clearly marked pedestrian paths within parking areas. Mid-block crossing are discouraged. However, if conditions warrant and are approved by City Engineer, crosswalks and signage indicating pedestrian activity should be installed at mid-block entrances where existing commercial uses are adjacent to other high-intensity uses, such as parks and schools where necessary for safety. Where possible, route pedestrians to grade separated crossing over State Route 29. (32)
- Policy 2.18 Pedestrian connections to employment destinations. Encourage the development of a network of continuous walkways within new commercial, town center, public, and industrial uses to improve workers' ability to walk safely around, to, and from their workplaces. Where possible, route pedestrians to grade separated crossings over State Route 29. (32)
- Policy 2.19 Pedestrian connections to schools. Continue developing the existing network of walkways between schools and residential uses, and encourage the development of new continuous walkways between schools and residential areas. Where possible route pedestrians to grade separated crossing over State Route 29. (32)
- Policy 3.11 Development that supports transit. Ensure that new development is designed to make transit a viable transportation choice for residents. Design options include:
  - Link neighborhoods to bus stops by continuous sidewalks or pedestrian paths. (37)

## Land Use Element (2010)

The Land Use Element of the American Canyon General Plan encourages the use of pedestrian-oriented amenities throughout the City and calls for connections between residential developments and community areas through a continuous pedestrian network of sidewalks, trails, and pathways. Design principles for commercial development to promote pedestrian activity and a “village” environment include pedestrian-oriented buildings, architectural character, clearly defined pedestrian access to parking areas, pedestrian plazas and open space, pedestrian-oriented signage, and pedestrian paths to adjacent districts. Separate development principles are established for the planned Town Center Core Area to establish a true “downtown” for American Canyon and “require that the Town Center Core Area provide a pedestrian-oriented, “village” environment, including a plaza or town square as a gathering place for community activities.”

## Parks and Recreation Element (1994)

- Policy 7.2.6 Link residential and commercial land uses by pedestrian trails (page 7-7)
- Policy 7.3.2 Designate status and approximate locations for the following types of trails in the Trails Master Plan:
  - Urban Trail – Urban trails are multi-purpose pedestrian/bicycle trails that connect residential areas to regional and community parks, schools, and commercial and industrial employment areas...
  - Rural Trail – Rural trails are multi-purpose equestrian/pedestrian/bicycle trails that are typically unpaved and used primarily for recreational purposes...(7-8)
- Implementation Program I7.10 Include a requirement in the new Zoning Ordinance that all development projects provide onsite, pedestrian-oriented open space facilities or pay in-lieu fees... (7-19)

## American Canyon Bicycle Plan

The Napa County Transportation and Planning Agency (NCTPA) developed the *Countywide Bicycle Plan Update* in 2012, with individual plans for each jurisdiction in Napa. Relevant policy statements are listed below and those that reference policies from local general plan documents are indicated in bold.

In addition to the Policies listed in the County Bicycle Plan, the American Canyon Bicycle Plan includes the following City-specific policies:

- AD-1.a: Create a bicycle and pedestrian friendly and convenient community. This includes the development of an integrated web of bicycle and pedestrian paths, linking river to ridge from east to west, while also offering north to south alternatives other than Highway 29. Connect residential areas, schools, parks, recreation activities, open space, and commercial, retail, and industrial areas, public areas, and transportation hubs. **(Policy 11.2 – Parks and Community Services Master Plan)** (page 16)



- AC-1.b: Provide for safe and efficient pedestrian and bicycle routes to local schools. **(Policy 11.3 - Parks and Community Services Master Plan)** (page 16)
- AC-1.c Create regional access – Connect to other Napa and Solano County destinations, including access to Regional transit. Complete the San Francisco Bay Trail through American Canyon as close to wetlands and Napa River as possible. Complete American Canyon’s portion of the Vine Trail. **(Policy 11.4 – Parks and Community Services Master Plan)** (page 17)
- AC-1.d: Communicate and coordinate with the NCTPA Bicycle Advisory Committee, NCTPA, Napa Valley Vine Trail Coalition, Napa County Bicycle Coalition, Napa County Regional Park and Open Space District and other related agencies and organizations to work collaboratively on projects that enhance connectivity for commuter and recreational bicyclists and pedestrians. **(Policy 11.5 – Parks and Community Services Master Plan)** (page 17)
- AC-1.e Develop a River to Ridge Trail from Wetlands Edge Road, along Eucalyptus Drive, to the Newell Open Space Preserve. **(Policy 11.8 – Parks and Community Services Master Plan)** (page 17)
- AC-1.f: Improve east-west connectivity with separated grade pedestrian/cyclist crossings, improved crosswalks; stop light timing, and other enhancements that make it safer for pedestrians and bicyclists to cross Broadway (SR 29). **(Policy 11.9 – Parks and Community Services Master Plan)** (page 17)
- AC-1.g: Create a physical connection to our historic watershed, establish bicycle and pedestrian access along the Napa River, American Canyon Creek, Rio Del Mar Creek, and Newell Creek. **(Policy 11.12 – Parks and Community Services Master Plan)** (page 17)
- AC-8.a: Develop connections wherever possible between pedestrian/bicycle circulation corridors and parks and open space opportunities. **(Policy 11.6 – Parks and Community Services Master Plan)** (page 21)
- AC-8.b: Ensure that all new development provides bicycle and pedestrian connectivity through the use of sidewalks, Class I multi-use paths and Class II bike lanes. **(Policy 11.11 – Parks and Community Services Master Plan)** (page 21)

# Appendix AC-C: Detailed Project List and Prioritization

AMERICAN CANYON PEDESTRIAN IMPROVEMENT LIST				
ID	Roadway	Limits or Intersection	Recommendations	Infrastructure Category
<b>TIER ONE</b>				
AC-2 SR 29 Traffic Calming and James Road Sidewalks	James Road, Melvin Road, Cassavre Drive, Theresa Avenue	Napa Junction Road to American Canyon Road	<ul style="list-style-type: none"> <li>Traffic calming study to determine potential measures to discourage northbound and southbound cut through traffic</li> </ul>	Traffic calming
	James Road	Donaldson Way to American Canyon Road	<u>Near-Term:</u> <ul style="list-style-type: none"> <li>Sidewalk on east side of street from Crawford Way to American Canyon Road</li> </ul>	Sidewalks
			<u>Medium-Term:</u> <ul style="list-style-type: none"> <li>Sidewalk on east side of street north of Crawford Way</li> </ul>	Sidewalks
			<u>Long-Term:</u> <ul style="list-style-type: none"> <li>Sidewalk on west side of street between Crawford Way and Donaldson Way as modifications to properties are permitted</li> </ul>	Sidewalks
AC-3 Donaldson Way Improvements	Donaldson Way	SR 29 to James Road	<ul style="list-style-type: none"> <li>Sidewalk on south side of street</li> </ul>	Sidewalk
		James Road to Andrew Road	<ul style="list-style-type: none"> <li>Tree trimming on the south side of the street for sidewalk clearance</li> </ul>	Maintenance
		Donaldson Way at Andrew Road (Intersection)	<ul style="list-style-type: none"> <li>Marked crosswalks on all legs with advanced stop bars</li> </ul>	Crossing treatments
		Carolyn Drive to Andrew Road	<ul style="list-style-type: none"> <li>Sidewalk on south side of street</li> </ul>	Sidewalk
			<ul style="list-style-type: none"> <li>Sidewalk on north side of street as modifications to properties are permitted</li> </ul>	Sidewalks



AMERICAN CANYON PEDESTRIAN IMPROVEMENT LIST				
ID	Roadway	Limits or Intersection	Recommendations	Infrastructure Category
AC-4 Safe Routes to School Improvements	Donaldson Way	Donaldson Way at Elliott Drive (Intersection)	<ul style="list-style-type: none"> <li>• Single lane roundabout with yellow school crosswalks</li> <li>• Relocated bus stop from southeast corner to near or far side of proposed roundabout</li> </ul>	Crossing treatments Traffic calming
	Benton Way	Benton Way at Chaucer Lane (Intersection)	<ul style="list-style-type: none"> <li>• High visibility crosswalk on west leg</li> </ul>	Crossing improvements
AC-7 SR-29 Pedestrian Crossings <sup>2</sup>	SR-29	SR-29 at American Canyon Road and Rio Del Mar	<ul style="list-style-type: none"> <li>• Grade-separated pedestrian crossings at the noted locations</li> </ul>	Pedestrian overcrossing
<b>TIER TWO</b>				
AC-1 Eucalyptus Drive/Theresa Avenue Intersection, Complete Streets (No. 2 Constrained CTP Project) <sup>3</sup>	Eucalyptus Drive	Eucalyptus Drive at Theresa Avenue (Intersection)	<ul style="list-style-type: none"> <li>• Roundabout (As part of Eucalyptus Realignment Project)</li> </ul>	Traffic calming
AC-5 Elliott Drive Traffic Calming	Elliott Drive	Donaldson Way to Crawford Way	<ul style="list-style-type: none"> <li>• Neck downs every 300' with access for bikes</li> <li>• "Wrong Way" bicycle signs on curb extensions for opposing direction</li> </ul>	Traffic calming Signing & Striping
		Elliott Drive at Crawford Way (Intersection)	<ul style="list-style-type: none"> <li>• Traffic circle with 20'-40' red curb along Elliott Drive at each corner</li> <li>• Marked crosswalk on north leg with refuge island</li> </ul>	Traffic calming Crossing treatments
		Elliott Drive at Larkspur Street (Intersection)	<ul style="list-style-type: none"> <li>• Traffic circle with 20'-40' red curb along Elliott Drive at each corner</li> </ul>	Traffic calming

AMERICAN CANYON PEDESTRIAN IMPROVEMENT LIST				
ID	Roadway	Limits or Intersection	Recommendations	Infrastructure Category
		Larkspur Street to American Canyon Road	<ul style="list-style-type: none"> <li>• Raised median with refuge at American Canyon Road</li> <li>• Red curb with restriped bike lanes and travel lanes to accommodate raised median</li> <li>• Bus stop relocation on east side of street at American Canyon Road to north of Larkspur Street</li> </ul>	Crossing treatments Transit
AC-6 American Canyon Road Improvements	American Canyon Road	American Canyon Road at Elliott Drive (Intersection)	<u>Near-Term:</u>	Crossing treatments ADA ramps
			<ul style="list-style-type: none"> <li>• Curb extensions on all corners with directional ramps</li> <li>• Median refuge for east leg crosswalk</li> </ul>	Crossing treatments
		West of Elliott Drive	<u>Long-Term:</u>	Pathway Traffic calming
<b>PREVIOUSLY PLANNED IMPROVEMENTS<sup>1</sup></b>				
AC-8 SR 29 Gateway (No. 7 Constrained CTP Project)	SR 29	American Canyon Road to Napa Junction Road	<ul style="list-style-type: none"> <li>• Multi-use pathway and Class IV bikeway installation on both sides of street (as part of 6-lane modified boulevard design)</li> <li>• Median refuges and marked crosswalks on all legs of signalized intersections</li> </ul>	Sidewalks Crossing treatments Pathway
		<b>RECOMMENDED ADDITIONS TO CTP PROJECT</b>		
		SR 29 at Donaldson Way (Intersection)	<ul style="list-style-type: none"> <li>• Feasibility assessment for reduced curb radii</li> <li>• Directional curb ramps</li> </ul>	Crossing treatments ADA ramps
AC-9 Vine Trail Railroad Crossing <sup>3</sup>	SR-29	SR-29 at Paoli Loop Road	<ul style="list-style-type: none"> <li>• Grade-separated Vine Trail crossing</li> </ul>	Pedestrian overcrossing



APPENDIX AC-C: DETAILED PROJECT LIST AND PRIORITIZATION

AMERICAN CANYON PEDESTRIAN IMPROVEMENT LIST				
ID	Roadway	Limits or Intersection	Recommendations	Infrastructure Category
AC-10 Pedestrian/Bicycle Railroad Crossing <sup>3</sup>	Railroad Tracks	East of SR-29 in vicinity of proposed “Town Center”	<ul style="list-style-type: none"> <li>Grade-separated pedestrian and bicycle crossing over the railroad tracks</li> </ul>	Pedestrian overcrossing
AC-11 Danrose / Kimberly Crossing Improvements <sup>3</sup>	Danrose Drive	Danrose Drive at Kimberly Drive	<ul style="list-style-type: none"> <li>Evaluation of lane width reductions or other measures to tighten up intersection and reduce crossing distances</li> </ul>	Traffic calming Crossing treatments
AC-12 Commerce Boulevard Extension <sup>3</sup>	Commerce Boulevard	Eucalyptus Drive to southern terminus of Commerce Boulevard	<ul style="list-style-type: none"> <li>Multi-use pathway</li> </ul>	Pathway / Sidewalks
AC-13 Newell Open Space Pathway <sup>3</sup>	Newell Creek	Newell Open Space Entrance at Newell Drive through Newell Open Space	<ul style="list-style-type: none"> <li>River to Ridge pathway connection through Newell Open Space</li> </ul>	Pathway
AC-14 River to Ridge Trail <sup>3,4</sup>	Eucalyptus Drive, Rio Del Mar, South Napa Junction Road and Newell Drive	Wetlands Edge Road to Newell Drive	<ul style="list-style-type: none"> <li>East-west multi-use pathway from Theresa Avenue to Newell Drive; Class II bike lanes west of Theresa Avenue</li> </ul>	Pathway / Bike Lanes
AC-15 Walsh Creek Neighborhood Pathway <sup>3</sup>	Walsh Creek	Cartagena Way to Via Bellagio	<ul style="list-style-type: none"> <li>Multi-use pathway including a pedestrian bridge over Walsh Creek at Marbella Court</li> </ul>	Pathway

1. These projects are pedestrian projects that are referenced in other planning documents. These projects were not evaluated during the scope of this Plan; however, they may be pursued through separate and ongoing efforts.
2. Source: American Canyon Circulation Element, 2013; This project was developed through separate and ongoing efforts. It was evaluated for prioritization due to local importance.
3. Source: American Canyon Bicycle Plan, 2012
4. The location of these two projects (AC-2 and AC-17) overlap and thus have the potential for coordination

Note: Tier One improvements are intended to be implemented within 5 years, Tier Two within 7-15, and Tier Three within 15 years or more, or opportunistically.

Based on feedback from NVTA TAC, improvements were evaluated based on the criteria below using a binary approach for ranking. Each improvement was ranked first based on the number of criteria it met, and second according to whether or not it had local support. Results are shown in the final table below. Tier Three projects, projects referenced from Plans other than the CTP, were not evaluated for prioritization.

PRIORITIZATION CRITERIA	
Criterion	Data Set / Metric
Local support	<ul style="list-style-type: none"> <li>• CTP Project</li> <li>• Critical location identified by staff / public</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• Collision “Hot Spot” Location</li> <li>• Highway Interchange Location</li> <li>• Traffic Calming</li> </ul>
Transit	<ul style="list-style-type: none"> <li>• Within ½ mile of a transit stop</li> <li>• Within a ¼ mile of a transit stop</li> </ul>
Connection	<ul style="list-style-type: none"> <li>• Sidewalk gap closure</li> <li>• Trail connection</li> </ul>
Schools	<ul style="list-style-type: none"> <li>• Within ½ mile of a school</li> <li>• Within ¼ mile of a school</li> </ul>
Cost	<ul style="list-style-type: none"> <li>• Low Cost Level (Signing and Striping)</li> </ul>



APPENDIX AC-C: DETAILED PROJECT LIST AND PRIORITIZATION

EVALUATION RESULTS									
Project	Local Support	Safety	Transit		Connection	Schools		Low Cost	Number of Criteria Met
			Half Mile	Quarter Mile		Half Mile	Quarter Mile		
<b>TIER ONE</b>									
AC-2	✓	✓	✓	✓	✓	✓	✓		7
AC-3	✓		✓	✓	✓	✓	✓		6
AC-4	✓	✓	✓	✓		✓	✓		6
AC-7	✓	✓	✓		✓	✓			5 <sup>1</sup>
<b>TIER TWO</b>									
AC-1	✓	✓	✓	✓		✓			5
AC-5		✓	✓	✓		✓	✓		5
AC-6	✓		✓	✓	✓	✓			5

1. Projects that met 5 or 6 criteria were on the border between Tier One and Tier Two. The ultimate Tier was determined based on input and discussions with staff.

# Appendix AC-D: Cost Estimates

AMERICAN CANYON TIER ONE PROJECT COST ESTIMATES <sup>1</sup>			
Project ID	Project Name	Project Elements	Cost <sup>2</sup>
AC-2	SR 29 Traffic Calming and James Road Sidewalks	Neighborhood traffic calming study	\$30,000
		<b>Near Term</b>	
		Sidewalk (Crawford to AC Road)	\$335,000 <sup>3</sup>
		<b>Medium Term</b>	
		Sidewalk (Crawford to Donaldson, east side)	\$335,000 <sup>3</sup>
		<b>Long Term</b>	
		Sidewalk (Crawford to Donaldson, west side)	\$335,000 <sup>3</sup>
			<b>Total: \$1,035,000</b>
AC-3	Donaldson Way Improvements	Sidewalk (SR 29 to James)	\$284,800 <sup>3</sup>
		Sidewalk (Carolyn to Andrew)	\$281,400 <sup>3</sup>
		Marked crosswalks at Andrew Road	\$4,700
			<b>Total: \$570,900</b>
AC-4	Safe Routes to School Improvements	Roundabout	\$350,000
		Bus stop sign relocation	\$400
		High visibility crosswalk	\$6,200
			<b>Total: \$356,600</b>

<sup>1</sup> For an estimated cost for the SR 29 Pedestrian Crossings (AC-7), which was developed through separate planning efforts, please refer to the Countywide Plan Vision 2040.

<sup>2</sup> Cost includes contingencies for traffic control (5%), construction management (10%), mobilization (5%), contingency (20%), design (15%) and environmental (10%).

<sup>3</sup> Includes utility and drainage contingency (40%)



# Appendix AC-E: Plan Adoption Resolution

*This is a placeholder for Plan Adoption Resolution*





## CHAPTER 8

# Countywide Implementation



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## Chapter 8

# Countywide Implementation

### Support Programs

Effective policies and comfortable, safe pedestrian designs are the foundation of pedestrian networks. However, policies and design are enhanced by accompanying programs that inform and educate users, enforce policies, and maintain infrastructure and can be key factors in increasing pedestrian safety. Successful and targeted education, enforcement, and engineering treatments can reduce pedestrian countywide pedestrian collision rates up to 13.3%<sup>9</sup>. Below are program recommendations for NVTA to initiate, enhance, or continue through direct sponsorship or indirect support. These programs incorporate elements of design, enforcement, education, encouragement and evaluation. Implementation of these programs depends on funding, availability of staff, and coordination with other groups and organizations. Three types of programs are addressed in the following section:

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<sup>9</sup> C. V. Zegeer, S. Masten, L. Marchetti, Y. Fan, L. Sandt, A. Brown, J. Stutts, and L. Thomas, "Evaluation of Miami-Dade Pedestrian Safety Demonstration Project," *Transportation Research Record*, No. 2073, pp. 1-10.

Safe Routes to School (SRTS), a Countywide Count Evaluation Program, and Vision Zero. These programs are best managed at the county-level as they require coordination among multiple jurisdictions. NVTA will work closely with individual jurisdictions to ensure implementation matches the individual context of each community within Napa County.

### Safe Routes To School (SRTS)

School zones are busy areas for pedestrians and bicyclists, with conflicts presented from navigating the many parents in cars dropping off or picking up students. However, children who walk or bike to school can experience improved physical health and can contribute to reducing traffic associated with school drop-off, as much as 25% of morning peak hour traffic<sup>10</sup>. The Napa County Office of Education (NCOE) currently has a four-year grant (though 2017) to administer programs to encourage children to safely walk or bicycle to school across the County as part of a SRTS Program. Program leaders have a goal of reaching every interested school by the end of the grant term, administering programs such as Walk and Roll to School Day, Bike Rodeos, and Safe Walking education presentations. Educational components of SRTS programs are especially important for school children where safe walking habits may be instilled as lifelong lessons.

Successful SRTS programs lead to changes in the way students and parents choose to travel to and from school. These programs succeed by including each of the “Five E’s” of SRTS to ensure that their project is a well-rounded, comprehensive approach to getting more students walking and bicycling. The Five E’s include education, encouragement, engineering, enforcement, and evaluation.

#### *Education and Encouragement*

As a result of the existing three-year SRTS grant, Napa County has implemented after-school and in-class education and encouragement programs in Calistoga, Howell Mountain, and throughout the Napa Valley Unified School District. The program includes events such as Walk and Roll to School Day, Bike Rodeos, and Safe Walking education presentations for students in grades K-3. Brochures in both English and Spanish are handed out during this program as well as at community events and PTA/parent meetings. Parent presentations include a review of pedestrian laws and ordinances. Although materials for these programs are available each year for schools across the County, reaching schools on a routine basis has not been possible due to understaffing and scarcity of volunteers.

#### Recommendations

- Coordinate with individual schools and Napa County Office of Education to distribute information to teachers, parents, and students about the following issues:
  - Recommended routes to walk or bike to school

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<sup>10</sup> Pedestrian and Bicycle Information Center (PBIC), Safe Routes to School Guide, Introduction to Safe Routes to School: the Health, Safety and Transportation Nexus, 2007.

- Benefits of walking or biking to school for parents and students
- Location and prescribed traffic patterns for pick up and drop off areas
- Potential fines for not obeying traffic laws in the school zone and pick up and drop off areas
- Alternative locations for “park and walk” or “walking school bus”
- Plan to roll out weekly Walk/Bike to School Day
- Ensure consistency with the Community Health Improvement Plan (CHIP) by seeking partnership opportunities between health agencies and SRTS to expand the reach of education and promotion of walking.

### *Engineering*

For SRTS programs, engineering refers to creating operational and physical improvements to the infrastructure surrounding schools that reduce both the speeds and potential conflicts with motor vehicle traffic, and can establish safer and fully accessible crossings, walkways, and trails.

### Recommendations

- Analyze the transportation and safety issues in each school area by coordinating a walk around the school site and along regularly traveled school routes with city and school staff, parents, and students. Also, identify areas for safe and secure long term bicycle parking. Determine solutions for existing concerns and potential funding sources for implementing improvements, including pursuit of grant funding.
- Coordinate with NVTA to seek additional funding for SRTS, especially for infrastructure projects recommended in the jurisdiction plans, Chapters 2-7.

### *Enforcement*

SRTS enforcement involves partnering with local law enforcement to ensure that traffic laws are obeyed in the vicinity of schools and initiating community enforcement such as crossing guard programs and student safety patrols. Specific enforcement actions may be related to travel speeds, yielding to pedestrians in crosswalks, and proper walking and bicycling behaviors. The following recommendations would contribute to pedestrian safety and should be considered by local police departments for feasibility based on scale and available resources.

### Recommendations

- Individual jurisdiction’s police departments should be a visible presence during school pick up and drop off periods, ticketing violators of traffic regulations in school zones, including speeding, illegal parking, not stopping for pedestrians in the cross walk, and U-turns.
- Tracking pedestrian-involved collisions aligned with enforcement efforts could help analyze trends and effectiveness of enforcement methods, where applicable.

### *Evaluation*

To measure the success of a SRTS program, local agencies should monitor and document outcomes, attitudes, and trends through the collection of data before and after different interventions. In Napa County, weekly travel mode to school data was collected in Spring 2015 for students in K-6. In addition, parent surveys were conducted to determine mode and distance traveled to school. Staff surveys were completed to gauge safety and infrastructure needs at specific school sites.

### Recommendations

- Use home distances from school from parent survey results to determine feasibility of rolling out Walking School Bus program where applicable. Track the number of children walking and biking to school and survey participating schools to track the success of implemented Walking School Bus programs.
- Refer to requested infrastructure needs from staff surveys during recommended site walks under *Engineering* above.
- This plan will establish an ongoing countywide count program for Napa County. While the program will encompass a range of different site types throughout the County, several will be located within a quarter-mile of primary and secondary schools. At these locations, counts will be completed during the typical morning (7-9 AM) and afternoon (4-6 PM) travel peaks, as well as during the afternoon dismissal period (2-4 PM). Consider monitoring pedestrian volumes near schools over time to document trends related to SRTS efforts. Reference these trends when applying for infrastructure funding.

### Countywide Count Evaluation Program

Establishing a countywide count program allows Napa County to measure facility use over time, evaluate pedestrian volumes before and after project implementation, and monitor travel patterns and safety conditions. In addition, count data may be used to support NVTAs and jurisdictions' applications for competitive grant funding by demonstrating the pedestrian demand in the project area. This count program could lead to a proactive approach to identify treatments and program funding as well as ensure that improvements are focused not only on areas with high pedestrian volumes and a high number of collisions, but also on areas with high collision rates (collision/daily pedestrian volume) that may not have as many people walking. Additionally, pedestrian volumes could be referenced proactively when setting speed limits and to determine if a reduced speed zone may be appropriate or other traffic calming measures may be needed, especially near school zones.

### *Count Methodology*

Baseline counts were conducted at 42 locations throughout Napa County in October and November 2015. Locations were chosen based on priority projects in the Countywide Transportation Plan (2015) and high-ranking projects from the walking audits of this plan. Observed pedestrian activity periods included the baseline morning (7-9 AM) and afternoon (4-6 PM) peaks, as well as school and weekend periods which were added based on adjacent land use and input from jurisdiction staff. Locations near schools received a count during the afternoon school dismissal (2-4 PM) and downtown locations were counted during the weekend midday peak (12-2 PM)

when recommended by jurisdiction staff. The implemented count schedule followed the methodology put forth in the MTC Handbook for Bicyclist and Pedestrian Counts (2003) and is consistent with researched best practices Statewide. The results of the counts are summarized in **Table 9** below.

TABLE 9: PEDESTRIAN COUNT PROGRAM VOLUMES						
ID	Jurisdiction	Location	Morning	Evening	School	Weekend
			7-9AM	4-6PM	2-4PM	12-2PM
AC1	American Canyon	SR 29 and American Canyon Rd.	32	90		
AC2	American Canyon	Melvin Road at Poco Way	3	6		
AC3	American Canyon	James Road at Donaldson Way	23	42		
AC4	American Canyon	Elliott Drive at Donaldson Way	97	55	196	
AC5	American Canyon	Elliott Drive at Crawford Way	25		33	
UNC1	Angwin	Brookside Drive at Howell Mountain	18	23	30	
UNC2	Angwin	White Cottage Road at College Avenue	14		11	
UNC3	Angwin	Howell Mountain and Clark	1	0		
CA1	Calistoga	SR 29 and Cedar Street	80	256		
CA2	Calistoga	Petrified Forest Road and Foothill Boulevard	2	5		20
CA3	Calistoga	Brannan and Lincoln	47	20		
CA4	Calistoga	Berry and Cedar	214		173	
CA5	Calistoga	Grant and Stevenson	22	22	10	
CA6	Calistoga	Grant Street and N. Oak Street	13	12		11
CA7	Calistoga	Lake County Hwy / Silverado Trail N / Lake Street		3		6
CA8	Calistoga	Lake Street and Grant Street	60		66	
NA1	City of Napa	Browns Valley Road and Westview Drive	26	17		
NA2	City of Napa	First Street and Freeway Drive	67	30		
NA3	City of Napa	Imola Ave and Parrish Road	17	112		
NA4	City of Napa	Jefferson and Old Sonoma Road	12	27		
NA5	City of Napa	Jefferson and Sierra Avenue	206	43	138	
NA6	City of Napa	Salvador Ave and Escuela Drive	34	26	29	
NA7	City of Napa	Redwood Rd. and Solano Avenue	189	106	194	
NA8	City of Napa	Silverado Trail at 3rd Street/Coombsville/ East	24	17	34	
NA9	City of Napa	Soscol and First Street	89	143		
NA10	City of Napa	Imola Avenue and Foster Rd	63	34	67	
NA11	City of Napa	Soscol at Kansas	44	49		
NA12	City of Napa	Soscol at Imola	23	117		
NA13	City of Napa	Undercrossing: SR 29 and Napa Creek	7	42	31	
SH1	St. Helena	Main St. and Pope Sreet	55	134		
SH2	St. Helena	Main Street at Adams Street	112	321		798
SH3	St. Helena	Hunt Avenue at Proposed Path (1)	23	37		

**TABLE 9: PEDESTRIAN COUNT PROGRAM VOLUMES**

ID	Jurisdiction	Location	Morning	Evening	School	Weekend
			7-9AM	4-6PM	2-4PM	12-2PM
SH4	St. Helena	Hunt Avenue at Proposed Path (2)	23	34		
SH5	St. Helena	Main and Grayson	8		16	
SH6	St. Helena	Main and El Bonita Avenue	5		8	7
SH7	St. Helena	Spring Mountain and Elmhurst	13		7	
SH8	St. Helena	Main and Pine	35	65		104
YT1	Yountville	Madison St. and Washington St.	100	73		
YT2	Yountville	Washington Street and Yount Street	149	245		797
YT3	Yountville	Yount Street and Mt Avenue	56	14	27	
YT4	Yountville	California Drive and Washington Street	96	59		
YT5	Yountville	Yount Street and Finnell	95	94	72	

The number of pedestrians observed during the morning hours of 7-9 AM ranged from 1 to 214. The highest volumes observed during this period were near schools, with over 200 pedestrians counted in Calistoga near Calistoga Elementary School and in the City of Napa near Vintage High School and Bel Aire Park Magnet School. The lowest volumes observed during this period were near the northeast corner of the unincorporated community of Angwin along Clark Way and near the southwest corner of the City of Calistoga at Petrified Forest Road and SR 128.

During the evening hours of 4-6 PM, pedestrian volumes observed throughout the County ranged from 0 to 321. The highest volumes were observed in downtown locations, with about 250 pedestrians observed in downtown Calistoga and in downtown Yountville, and 321 observed in downtown St. Helena. The lowest volumes observed during this period were in the unincorporated community of Angwin adjacent to Clark Way and in the City of Calistoga near the northeast city boundary at the intersection of Silverado Trail N and Lake Street.

Pedestrians observed throughout the County during the school dismissal period of 2-4 PM ranged from 7 to 196. The highest number of pedestrians during this period was about 200 in the City of American Canyon and the City of Napa, and the lowest were in St. Helena where less than 10 pedestrians were counted.

Weekend counts were collected in the afternoon from 12-2 PM and ranged from 6 to 798 pedestrians. The highest volumes were observed in downtown Yountville and St. Helena, where close to 800 pedestrians were counted. The lowest number of pedestrians were in Calistoga near Oat Hill Mine Trailhead and near the southern end of St. Helena at SR 29 and El Bonita Avenue.

Of all locations observed throughout the county, an average of 54 pedestrians was recorded during the AM period (7-9 AM) and an average of 68 were observed during the PM period (4-6 PM). During the midday school observations (2-4 PM), an average of 63 pedestrians were counted at each location evaluated. An average number of 249 pedestrians was counted during the weekend count period (12-2 PM). These values varied significantly

based on population density of a given neighborhood or jurisdiction, as well as by the adjacent land use. Individual jurisdiction plans provide additional details about the pedestrian counts completed within those locations.

### *Evaluation and Next Steps*

Going forward, NVTA intends to conduct annual counts throughout the County on an annual basis. Counts will primarily be conducted in locations evaluated in the baseline year (2015) to monitor travel trends and the impact of project implementation on pedestrian volumes, as well as justify funding for priority projects in this plan. With the collected counts, NVTA may compare travel patterns across different locations, measure changes in pedestrian use at a single location over time, and evaluate the extent to which pedestrian travel peaks throughout the course of the day or week. By collecting counts at different times of day, NVTA may evaluate if a given pedestrian facility is typically used for recreational or utilitarian purposes.

NVTA should consider purchasing a mobile automated trail counter. With this counter, NVTA may collect data for extended periods of time at different locations, providing a more holistic understanding of pedestrian behavior at these sites.

In the future, count locations may be added or omitted based on agency priorities, and could include pedestrian-involved collision locations to prioritize improvements in locations based on collision rates (collision/daily pedestrian volume). Individual jurisdictions may choose to add additional count locations at midblock locations where marked crosswalks may be considered based on existing pedestrian demand. These could be midblock locations where pedestrians are observed crossing the street such as between a hotel and a winery, a residential zone and a shopping center, or shopping and public parking. Pedestrian volumes at these locations could help determine if a midblock crosswalk should be evaluated based on the Crosswalk Guidelines in this plan.

### *Vision Zero*

Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries while increasing safe, healthy, and equitable mobility for all. The initiative has gained momentum in major American cities including San Francisco, New York City, Chicago, Los Angeles, Seattle, Washington DC and San Jose. In the form of a plan and/or policy, it challenges the existing approach to traffic safety by acknowledging that traffic deaths and severe injuries are preventable and by taking a multidisciplinary approach to tackle this complex problem. Vision Zero often starts at the local level and engages law enforcement, engineering, education, and evaluation to help reach its goals. Implementation can include development of data-driven tools to identify high-injury networks and select priority locations for targeted engineering, education, and enforcement.

### *Recommendations*

- Identify opportunities for funding for Vision Zero efforts, such as developing a Countywide database to inventory collision data and environmental factors, undertaking a comprehensive analysis to understand collision patterns, and facilitating an outreach process to identify community safety priorities and determine where to focus safety investments and improvements.

## Performance Goals

Napa County intends to monitor progress on the implementation of this Pedestrian Plan over time. **Table 10** summarizes the County's four performance goals and includes information on the associated metrics and policies to make progress toward meeting those goals.

This plan will be updated every 5-7 years, including an analysis of the increase in walking from the implementation of proposed facilities through the Countywide Count Evaluation Program, as well as an evaluation of the remaining project list. This update will ensure that proposed projects still meet the needs of the community.

**TABLE 10: PERFORMANCE GOALS**

Goal	Metric	Key Actions
<p>1. Provide a connected network of pedestrian sidewalks, trails, and pathways in the County and its jurisdictions that are safe and accessible to a variety of users and that foster community interactions</p>	<p>Establish a construction pace of one pedestrian capital improvement project per year per jurisdiction</p> <p>Coordinate with NVTa to seek additional funding for infrastructure projects that support safe routes to school</p> <p>Reduce annual pedestrian related collision rate by half by 2040</p>	<ul style="list-style-type: none"> <li>• Continue to seek grant funding to implement the projects recommended in each jurisdiction plan</li> <li>• Coordinate with jurisdiction staff to inform schools and communities of relevant funding and grant opportunities</li> <li>• Reference the public involvement, analysis, and project evaluation efforts of this plan when applying for grants to fund projects</li> <li>• Address collision locations identified in this plan by installing the projects identified and implementing the planned education and enforcement programs in Chapter 8.</li> <li>• Use 2015 as the baseline year for evaluation with progress evaluations at five-year intervals.</li> </ul>
<p>2. Encourage walking trips through enhancing key pedestrian connections to transit</p>	<p>Increase the number of walking trips to transit by 50% by 2040</p>	<ul style="list-style-type: none"> <li>• Work with NVTa and VINE to monitor the percentage of riders walking to transit</li> <li>• Prioritize and implement improvements near the VINE stations and high use stops in support of this goal</li> </ul>
<p>3. Take advantage of overlapping opportunities</p>	<p>Identify Complete Streets funding and project synergies with development and infrastructure projects</p>	<ul style="list-style-type: none"> <li>• Review environmental documents and proposed development plans for consistency with this plan and for a proposed facility’s ability to accommodate the needs of users of all ages and abilities</li> <li>• Consider pedestrian facilities in all road resurfacing and intersection improvements</li> </ul>
<p>4. Encourage and educate residents about walking and enforce safe interactions between pedestrians and motorists</p>	<p>Administer SRTS programs to each interested school by the end of the grant cycle (2016) and secure grant to continue program</p> <p>Launch Safe Routes for Seniors and Safe Routes to Transit initiatives</p>	<ul style="list-style-type: none"> <li>• Implement the SRTS Program recommendations in this plan</li> <li>• Distribute pedestrian safety brochures to the public to promote walking to community events</li> <li>• Pursue grant funding through the California Office of Traffic Safety for a media safety campaign for motorists and implement campaign countywide through advertisements on buses and bus shelters, through SRTS and in-school curriculum, public service announcements, and/or brochures distributed by law enforcement</li> <li>• Collaborate with senior centers and advocates to implement education, encouragement, and engineering projects to improve mobility for senior pedestrians</li> <li>• Collaborate with transit providers to prioritize and implement access improvements to transit stops</li> </ul>

## Plan Consistency

This plan will build on, and need to coordinate with, a number of related planning efforts occurring not only at the countywide level but also at the city, regional, state, and federal levels. This section provides an overview of the policy framework surrounding pedestrian planning in Napa County by summarizing the key plans and policies that will affect and be affected by implementation of this plan. Key planning efforts include various routine accommodation and “complete streets” policies at the federal, state and regional levels; recent state legislation related to global warming and emissions of greenhouse gases; the MTC Bay Area Regional Bicycle Plan; NVTAs Countywide Bicycle Plan; and local general plans.

This plan is consistent with plans and policies at federal, state, and local levels.

### Federal Policies

The United States Department of Transportation (US DOT) can issue Policy Statements to help guide actions at lower levels of government

#### *US DOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations*

In 2010, the United States Department of Transportation (US DOT) issued a policy directive in support of walking and bicycling, encouraging transportation agencies to go beyond minimum standards in fully integrating active transportation into projects. As part of the statement, the US DOT encouraged agencies to adopt similar policy statements in support of walking and bicycling considerations such as:

- Considering walking and bicycling as equals with other transportation modes
- Ensuring availability of transportation choices for people of all ages and abilities
- Going beyond minimum design standards
- Integrating bicycling and pedestrian accommodations on new, rehabilitated, and limited access bridges
- Collecting data on walking and bicycling trips
- Setting mode share for walking and bicycling and tracking them over time
- Removing snow from sidewalks and shared use paths
- Improving non-motorized facilities during maintenance projects

#### *Americans with Disabilities Act*

The Americans with Disabilities Act 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 those with disabilities. While the letter of the law applies to “public accommodations,” the spirit of the law applies not only to public agencies but to all facilities serving the public, whether publicly or privately funded.

## State Policies

State policies that relate to this plan include:

### *Complete Streets Act of 2008*

California’s Complete Streets Act of 2008 (Assembly bill 1358) requires all cities and counties 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 (GHG) emissions to be reduced by 28 percent by the year 2002 and by 50 percent by the year 2050 in response to climate change. Senate Bill 375 provides the implementation mechanisms for AB 32. It requires metropolitan planning organizations and regional planning agencies to plan for these reductions with the development of Sustainable Community Strategies, which will be a regional guide for housing, land uses, and transportation and will incorporate the Regional Transportation Plan (RTP). One key component of this is the reduction of automobile trips and vehicle miles traveled. Planning for increases in walking, bicycling, and transit use as viable alternatives are important components of these plans.

### *Caltrans Deputy Directive 64*

In 2001, the California Department of Transportation (Caltrans) adopted Deputy Directive 64 (DD-64), “Accommodating Non-motorized Travel,” which contained a routine accommodation policy. The directive was updated in 2008 and in 2014 as “Complete Streets—Integrating the Transportation System.” The new policy reads in part:

“Caltrans views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system.

Caltrans develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian and transit travel is facilitated by

creating “complete streets” beginning early in system planning and continuing through project delivery and maintenance and operations....”

The directive establishes Caltrans’ own responsibilities under this policy. Among the responsibilities that Caltrans assigns to various staff positions under the policy are:

- Ensure bicycle, pedestrian, and transit interests are appropriately represented on interdisciplinary planning and project delivery development teams.
- Ensure bicycle, pedestrian, and transit user needs are addressed and deficiencies identified during system and corridor planning, project initiation, scoping, and programming.
- Ensure incorporation of bicycle, pedestrian, and transit travel elements in all Caltrans transportation plans and studies.
- Promote land uses that encourage bicycle, pedestrian, and transit travel.
- Research, develop, and implement multimodal performance measures.

### Regional and County Policies and Connections

This plan is consistent with regional- and county-level plans. Pedestrian and bicycle networks were reviewed from local and regional agencies, including MTC, the Association of Bay Area Governments (ABAG), and NVTAA to promote a coordinated regional system. These plans are described briefly below.

#### *Sonoma County Bicycle and Pedestrian Plan (2010)*

Completed in 2010, the Sonoma County Bicycle and Pedestrian Plan provides a list of policies, projects, and programs for increasing bicycle and pedestrian mode share throughout Sonoma County. While no policies explicitly highlight connections to Napa County, several identified projects terminate at the Napa-Sonoma County border. Portions of the Sonoma County Bay Trail connect directly with the Napa County sections of the Bay Trail. For example, the Sonoma Plan proposes Bay Trail segments from Hudeman Slough (Project 206C) and from Dale Avenue (Project 206A) to the Napa County border.

#### *Solano Countywide Pedestrian Transportation Plan (2012)*

The Solano Countywide Pedestrian Transportation Plan, approved in 2012, explicitly discusses how the plan fits within the regional pedestrian context. The plan includes a goal to “develop a pedestrian connections network that connects to northern California’s alternative modes system”, with a specific objective to “plan and implement access to public transit connections to neighboring counties (i.e. Yolo County, Napa County, Sacramento County, etc.)”. Portions of the Bay Trail in Solano County extend along the Vallejo waterfront with plans to ultimately route the trail to Bay Trail segments in American Canyon in Napa County.

*Bay Trail Gap Analysis Study (2005)*

The Bay Trail Project is a nonprofit organization administered by ABAG that plans, promotes and advocates for the implementation of a continuous 500-mile bicycling and hiking path around San Francisco Bay. When complete, the Trail will pass through 47 cities, all nine Bay Area counties, and cross seven toll bridges. The Gap Analysis Study identifies portions of the Trail yet to be completed, and groups these into short-, medium-, and long-term projects. Much of the Bay Trail development in the past has been in San Francisco, San Mateo, Alameda, Contra Costa, and Marin Counties. Physical and environmental constraints in the North Bay have limited Bay Trail development in Sonoma and Napa Counties; however, projects such as the Sonoma Baylands, Sears Point Restoration, Napa Sonoma Marsh and Wetlands Edge Trail in American Canyon are representative of increasing progress toward Bay Trail implementation in the North Bay. This study includes several proposed Bay Trail projects within Napa County:

- 6.9 miles of the Bay Trail are included in the plan as short-term projects
- 22.4 miles of Bay Trail are included in the plan as medium-term projects
- 3.86 miles of Bay Trail are included in the plan as long-term projects

*Napa Valley Vine Trail Project Plan (2013)*

The Napa Valley Vine Trail Project Plan describes an initiative to build a walking and bicycling trail connecting the entire Napa Valley. This proposed 47-mile Napa Valley Vine Trail is seen as the key link in a Napa County-wide trail system, which also includes portions of the region-wide Bay Trail and Ridge Trail. The Trail project is a partnership between the NVTANVTA and the Napa Valley Vine Trail Coalition. Several recommended improvements in this plan align with existing or planned segments of the Vine Trail and include:

- Redwood Road at Solano Avenue Intersection Improvements in Napa (Improvement N-26)
- RLS Middle School Sidewalk and Hunt Avenue Improvements in St. Helena (Improvement SH-1)
- South St Helena / Unincorporated Connection in St. Helena (Improvement SH-11)
- Vine Trail Improvements in Yountville (Improvement Y-4)
- Madison Street Wayfinding in Yountville (Improvement Y-9)

*Napa County Regional Park and Open Space District Master Plan (2009, 2012 update)*

The first Master Plan for the Napa County Regional Park and Open Space District was adopted by the Board of Directors in 2009, with a plan update approved in 2012. Of the plan's guiding policies, two are of particular relevance to this planning effort:

- Promote non-motorized recreation facilities such as hiking trails, bicycle routes and other facilities that link the County's cities, town and communities to each other and to regional parks and other important destinations.

- Increase recreational trails open to the public by at least 100 miles, working in partnership with other governmental agencies and non-profit land conservation organizations.

### *MTC Policy on Routine Accommodation*

MTC is the regional transportation planning agency for the Bay Area. In 2006, MTC adopted a policy on “Routine Accommodation.” The policy states that pedestrian and bicyclist consideration must be integrated into planning, design, and construction of transportation projects that use regional transportation funds. The policy requires sponsors of a project, such as a city or county agency, to complete a project checklist, often referred to as a Complete Street Checklist. The checklist is intended to be completed at the earliest stages of the projects so that considerations for bicyclist and pedestrian accommodation can be made at the inception of the project.

### *Plan Bay Area Regional Transportation Plan*

The Association of Bay Area Governments (ABAG) is the comprehensive regional planning agency and Council of Governments for the nine counties and 101 cities of the San Francisco Bay region. Motivated by the California Sustainable Communities and Climate Protection Act of 2008, ABAG developed Plan Bay Area in July 2013, as regional transportation plan that guides the Bay Area in a long-range plan to significantly reduce greenhouse gases by 2040. The focus of this plan is to devote most (87%) of funding to operate and maintain the existing transportation network, with the remaining budget aimed at next-generation transit projects and other programs that support reducing GHG emissions.

### *Vision 2040: Moving Napa Forward*

The Napa Countywide Transportation Plan – Vision 2040: Moving Napa Forward is a long-range transportation plan that includes a list of transportation investments for the next 25 years. The Napa Countywide Transportation Plan identifies goals and objectives that apply to all modes of transportation and identifies issues and challenges while setting the stage for a long range vision for the county. Several objectives highlighted in Moving Napa Forward align with the goals of this plan:

- Educate all roadway users so they may safely coexist.
- Work with Napa County jurisdictions to adopt complete streets policies to meet the MTC funding eligibility requirements.
- Prioritize projects that expand travel options for cyclists and pedestrians as well as those projects that improve operation and safety for vehicles, pedestrians, and cyclists
- Increase mode share for transit, walking, and bicycling to 10% by 2035

The plan also identifies key active transportation policies and concepts, discussing the role of complete streets, complete bicycle and pedestrian networks, and wayfinding and signage in encouraging active transportation within the county. Moving Napa Forward also includes a chapter focused on Transportation and Health, identifying a key priority action area as “[improving] wellness and healthy lifestyles”.

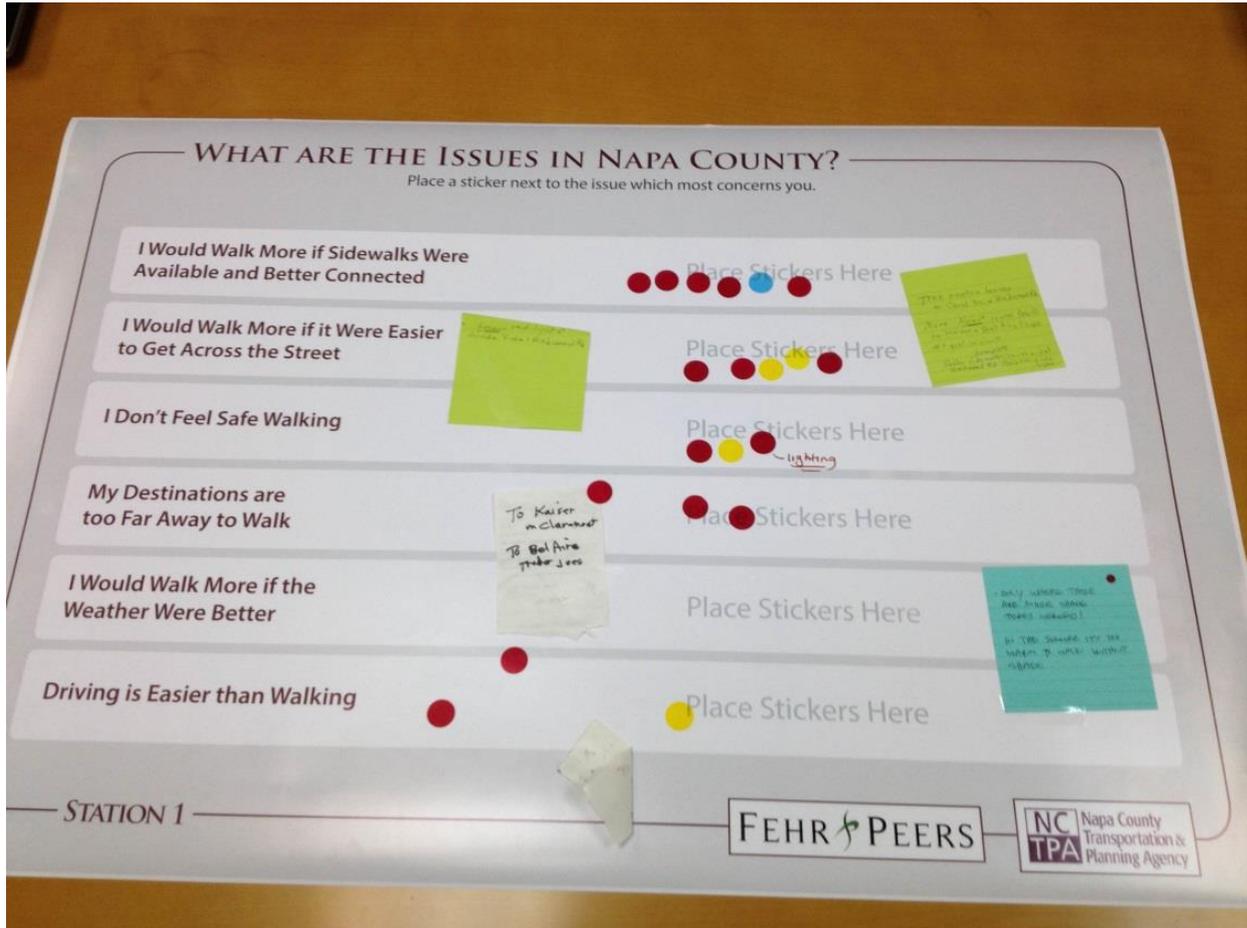
## Local Plans

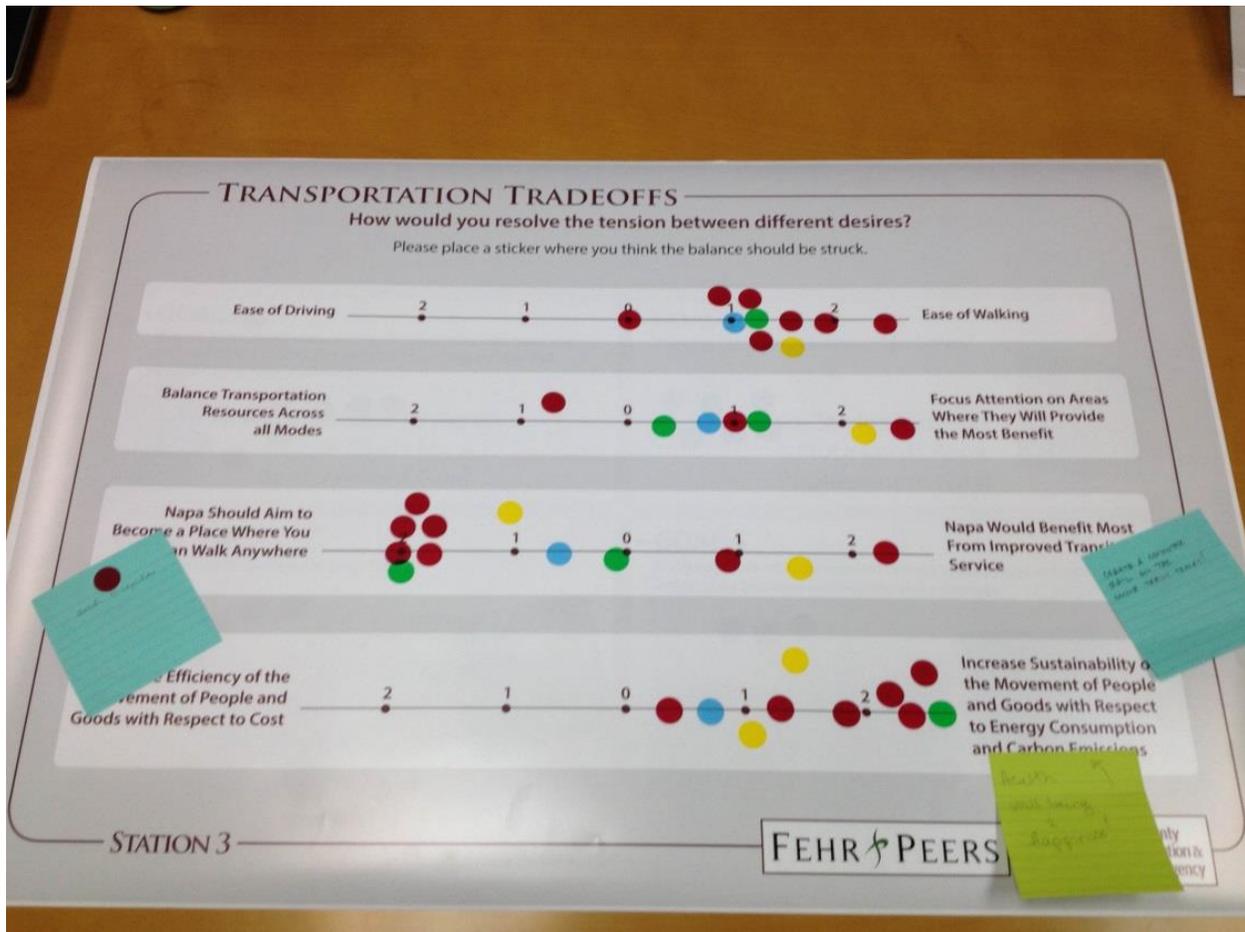
### *Evaluation and Next Steps*

Napa County consists of six local jurisdictions: four cities, one town and the County government, which has responsibility for the unincorporated areas of the County. All six jurisdictions have adopted policies as part of their respective general plans in support of walking. A list of these policies can be found in Appendix B of each Jurisdiction Plan, *Existing Pedestrian Policies*.

# Appendix A – Public Workshop Materials

January 22, 2015 - NVT A





**GOALS**

Do you agree that the goals outlined here are the most important ones for Napa? If not, which one(s) would you replace and with what?

Goals are the broad priority areas of the Countywide Pedestrian Plan. We propose the four goals below.

**• GOAL 1**  
Provide a connected network of pedestrian sidewalks, trails, and pathways in the County and its jurisdictions that are safe and accessible to a variety of users.

Place Stickers To Agree & Note Cards For a Replacement Goal

**• GOAL 2**  
Encourage a multi-modal transportation system.

Place Stickers To Agree & Note Cards For a Replacement Goal

**• GOAL 3** *essential*  
Obtain funding for pedestrian projects.

Place Stickers To Agree & Note Cards For a Replacement Goal

**• GOAL 4**  
Encourage and educate residents about walking and enforce safe interactions between pedestrians and motorists.

Place Stickers To Agree & Note Cards For a Replacement Goal

**STATION 3**

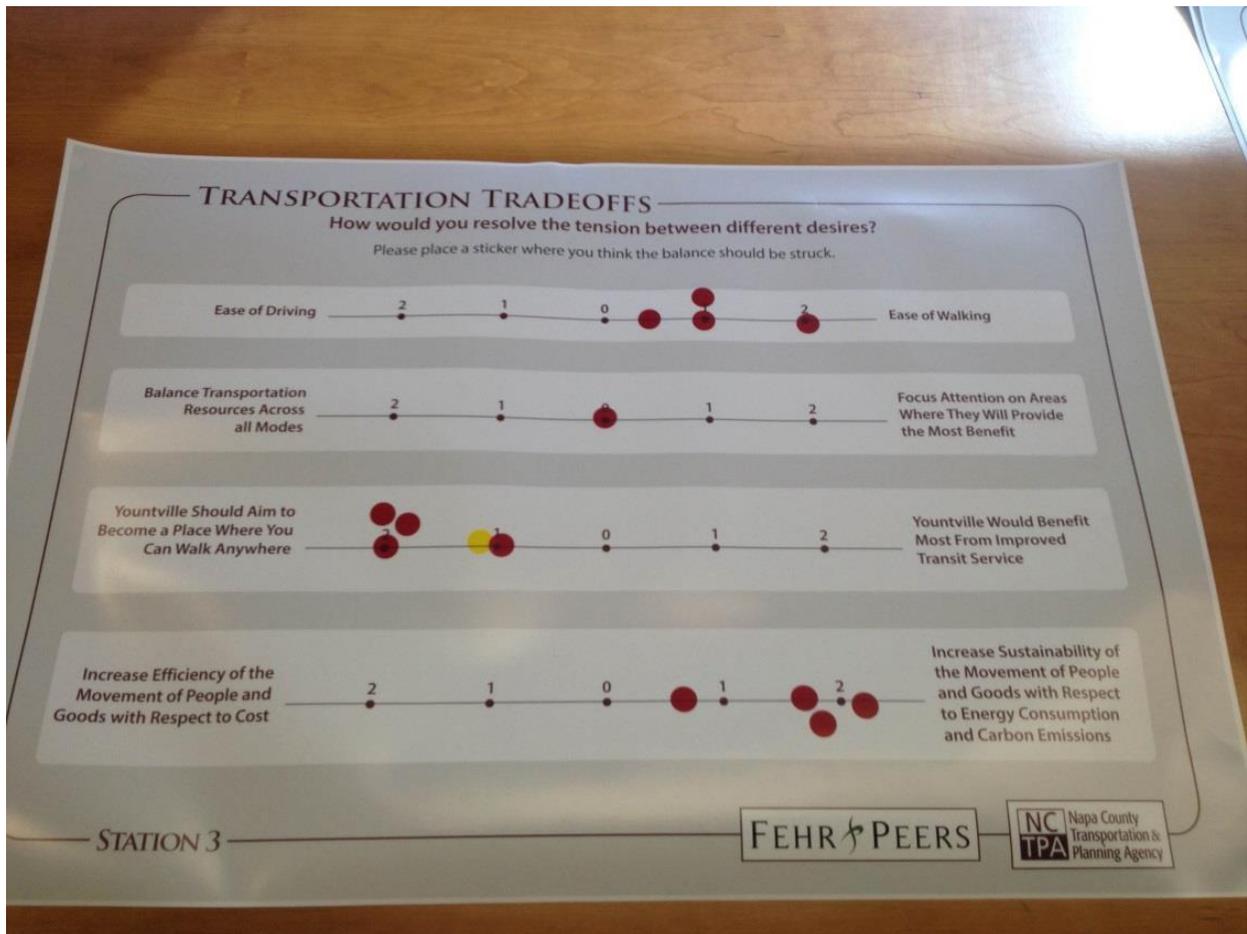
FEHR & PEERS

NC TPA Napa County Transportation & Planning Agency

*Handwritten notes on sticky notes:*

- Goal 1: "I like this goal, it covers..."
- Goal 2: "I like this goal, it covers..."
- Goal 3: "I think people will walk away..."
- Goal 4: "Work w/ Health Agencies to target Childhood obesity high rates in county (compared to state)"

January 27, 2015 – Yountville Town Hall



**GOALS**

*Do you agree that the goals outlined here are the most important ones for Yountville?  
If not, which one(s) would you replace and with what?*

Goals are the broad priority areas of the Countywide Pedestrian Plan.  
We propose the four goals below.

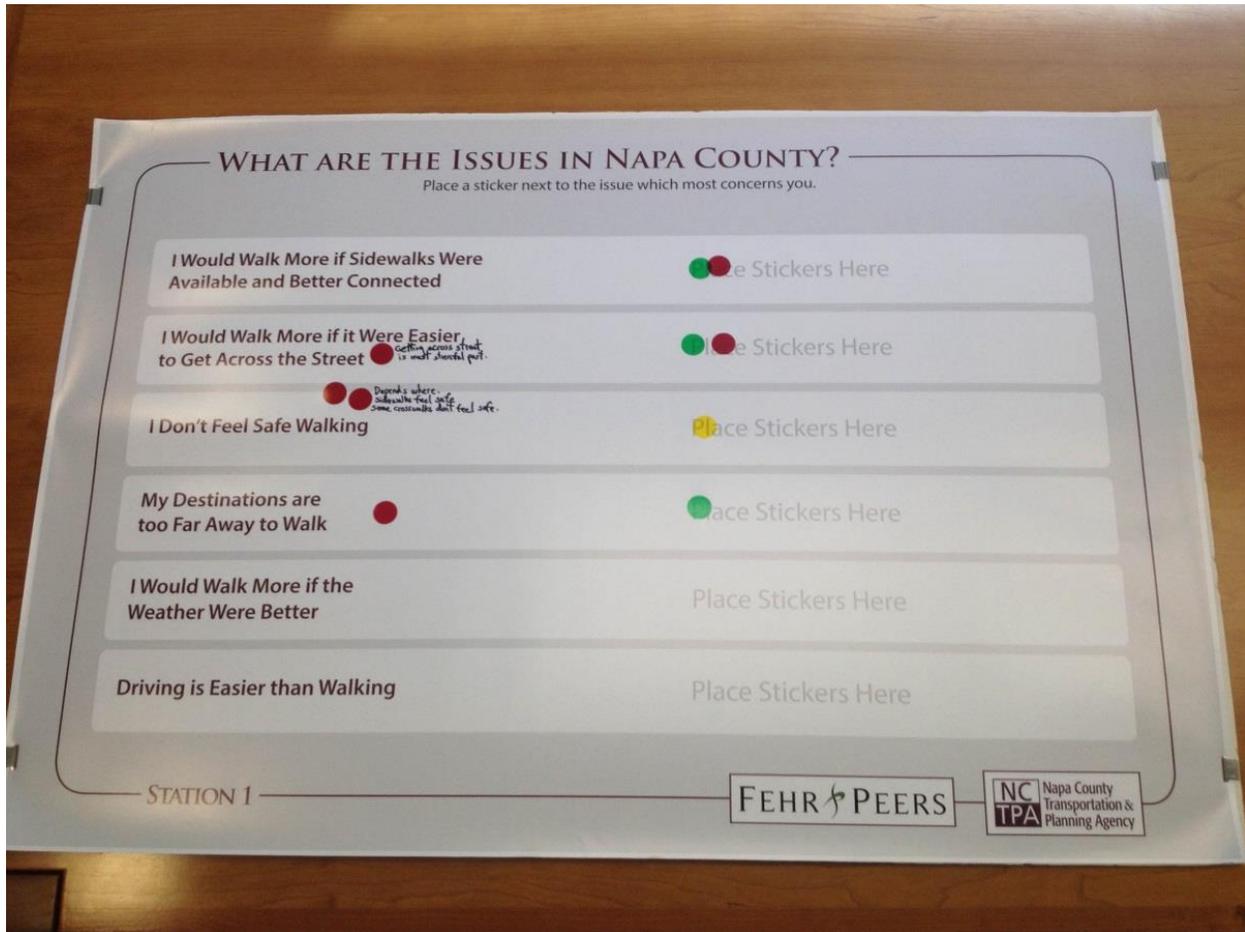
<p><b>• GOAL 1</b> Provide a connected network of pedestrian sidewalks, trails, and pathways in the County and its jurisdictions that are safe and accessible to a variety of users.</p> <p>Place Stickers To Agree &amp; Note Cards For a Replacement Goal</p> 	<p><b>• GOAL 2</b> Encourage a multi-modal transportation system.</p> <p>Place Stickers To Agree &amp; Note Cards For a Replacement Goal</p> 
<p><b>• GOAL 3</b> Obtain funding for pedestrian projects.</p> <p>Place Stickers To Agree &amp; Note Cards For a Replacement Goal</p> 	<p><b>• GOAL 4</b> Encourage and educate residents about walking and enforce safe interactions between pedestrians and motorists.</p> <p>Place Stickers To Agree &amp; Note Cards For a Replacement Goal</p> 

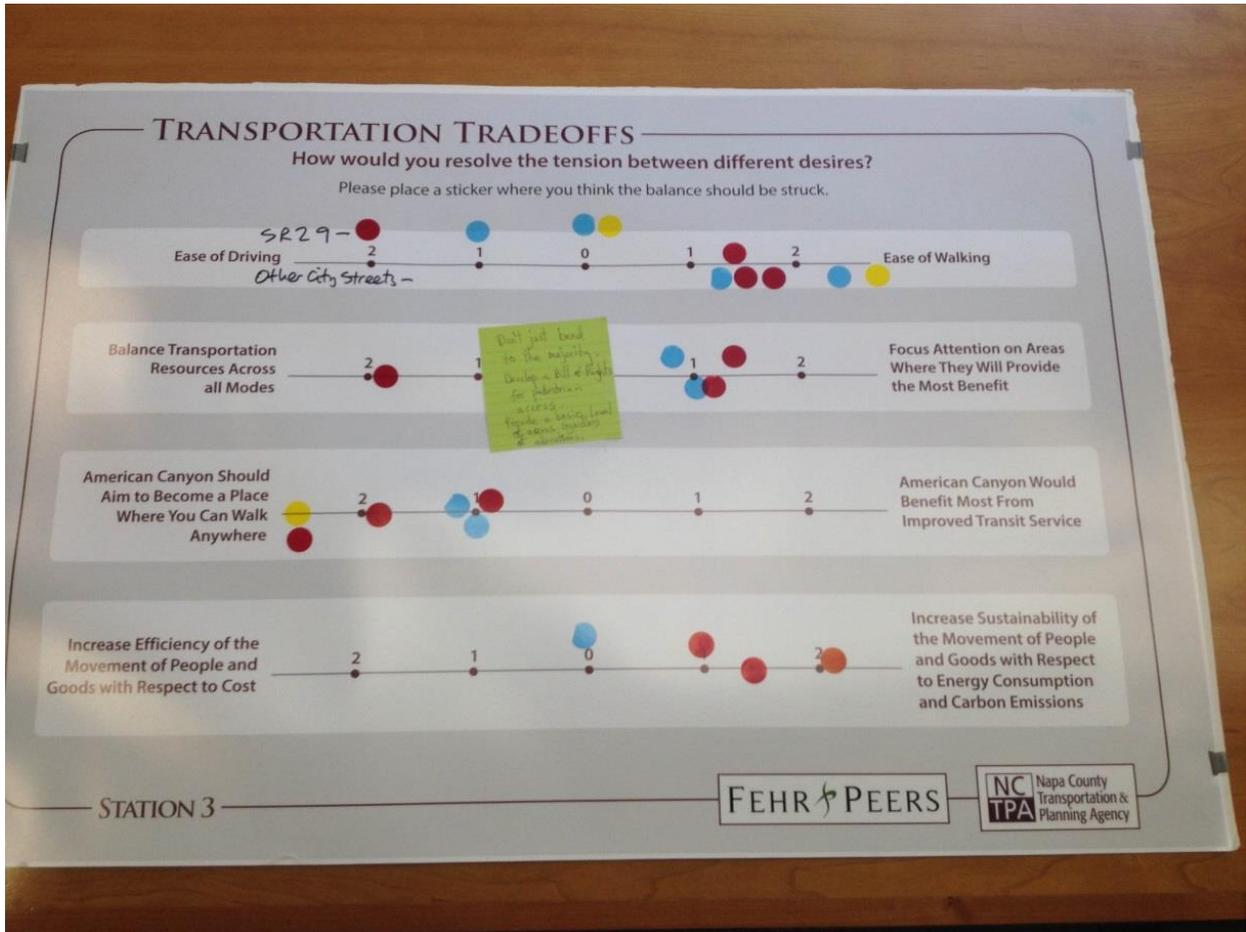
STATION 3

FEHR & PEERS

NC TPA Napa County Transportation & Planning Agency

February 4, 2015 – American Canyon City Hall





**GOALS**

Do you agree that the goals outlined here are the most important ones for American Canyon?  
If not, which one(s) would you replace and with what?

Goals are the broad priority areas of the Countywide Pedestrian Plan.  
We propose the four goals below.

- GOAL 1**  
Provide a connected network of pedestrian sidewalks, trails, and pathways in the County and its jurisdictions that are safe and accessible to a variety of users.
- GOAL 2**  
Encourage a multi-modal transportation system.
- GOAL 3**  
Obtain funding for pedestrian projects.
- GOAL 4**  
Encourage and educate residents about walking and enforce safe interactions between pedestrians and motorists.

Place Stickers To Agree & Note Cards For a Replacement Goal

Place Stickers To Agree & Note Cards For a Replacement Goal

Place Stickers To Agree & Note Cards For a Replacement Goal

Place Stickers To Agree & Note Cards For a Replacement Goal

STATION 3

FEHR PEERS

NC TPA Napa County Transportation & Planning Agency

## Appendix B – Ped INDEX Methodology

This Appendix presents the approach to estimating pedestrian demand within Napa County and summarizes the methodology and preliminary results. The results helped inform the decision for priority focus areas and walking audit locations; additional factors that were considered to provide context for that decision are discussed under *High Improvement Need*. In addition to developing suggested focus areas for this plan, further recommended next steps are listed at the end of this Appendix.

### Methodology

Fehr & Peers used existing GIS data to develop a pedestrian demand model that identifies variations in pedestrian activity and potential demand on streets throughout Napa County. Pedestrian demand is based on several variables, including proximity, built environment, demographic, and zoning factors that are considered indicators for pedestrian activity. The variables, sources and scoring criteria are summarized in **Table B-1**. Each heading is defined below:

- **Input Factor** – pedestrian demand variable considered
- **Source/Format** – data source and GIS format (either point or polygon)
- **Range of Factor** – range of possible values associated with the factor, grouped for scoring purposes
- **Variable Score** – score assigned to reflect importance of value range for pedestrian demand, from zero to 100
- **Processing** – description of how factor is mapped and scored
- **Significance and Weighting Factor** – significance of variable to overall pedestrian demand, and relative scoring factor, applied when all factors are considered together for the total pedestrian demand score of each roadway segment. The weighting factors listed in the table add up to 100, so the compiled scores range from zero to 100.

**TABLE B-1: LIST OF VARIABLES USED IN GIS PEDESTRIAN DEMAND MODEL**

Input factor	Source / Format	Range of Factor	Variable Score	Processing	Significance and Weighting Factor
<b>Built Environment (Density and Diversity of Land Uses)</b>					
Population Density – per acre	Census 2010/ Polygon	0-3 persons per acre	0	Uses kernel density (persons per acre) to derive average density within a 1 mile buffer using census block group data Assigns average grid value to street centerline	High 14/100
		3-6	20		
		6-9	40		
		9-12	60		
		12-15	80		
		15+	100		
Employment Density – per acre	Smart Database Job Locations/ Polygon	0-3 persons per acre	0	Uses kernel density (per acre) to derive average number of employees within a 1 mile buffer using census block group data Assigns average grid value to street centerline	High 14/100
		3-6	20		
		6-9	40		
		9-12	60		
		12-15	80		
		15+	100		
Intersection Density	Smart Database – Street Intersection Density	0-50	0	Calculates total intersection density, weighted to reflect connectivity for pedestrian and bicycle travel. The denominator is total land area.	High 14/100
		50-100	25		
		100-150	50		
		150-200	75		
		200+	100		
Land Use Mix – ratio in each census block group	Smart Database Jobs-to-Population Ratio/ Polygon	0-.1	0	Calculates the jobs to population ratio for census block group Assigns average grid value to street centerline <i>**Census block groups with a population density less than 3 persons/sq. mile were excluded in the analysis to filter out rural areas that may otherwise get a high score</i>	Medium 10/100
		0.1-0.2	25		
		0.2-0.3	50		
		0.3-0.4	75		
		40+	100		
<b>Proximity Factors (Destinations)</b>					
Schools – distance in feet	City/ Polygon	0-330 feet	100	Uses buffer to define ranges of distance to nearest school Assigns average grid value to street centerline	Medium 9/100
		330-660	95		
		660-1320	85		
		1320-2640	50		
		2640-5280	25		
		5280+	0		

TABLE B-1: LIST OF VARIABLES USED IN GIS PEDESTRIAN DEMAND MODEL

Input factor	Source / Format	Range of Factor	Variable Score	Processing	Significance and Weighting Factor
Parks – distance in feet	City/ Polygon	0-330feet	100	Uses buffer to define ranges of distance to nearest park Assigns average grid value to street centerline	Medium 9/100
		330-660	75		
		660-1320	50		
		1320-2640	25		
		2640+	0		
Transit Proximity, Bus Stops – distance in feet	City, MTC/ Points	0-330feet	100	Uses buffer to define ranges of distance to nearest bus stop Assigns average grid value to street centerline	Medium 9/100
		330-660	95		
		660-1320	85		
		1320-2640	75		
		2640+	0		
		660-1320	95		
		1320-2640	75		
		2640-5280	50		
Major Retail Destinations/ Downtown/Community Commercial Zone – distance in miles	Neighborhood Shopping Districts and other Retail Areas (city zoning plans)/Polygons	0 miles	100	Uses buffer to define ranges of distance to nearest retail corridor Assigns average grid value to street centerline	Medium 9/100
		0-.5	50		
		.5+	0		
		660-1320	75		
		1320-2640	50		
		2640-5280	25		
		5280+	0		
<b>Demographics</b>					
Age - % under 18 and over 65	Census 2010/ Polygons	0-15 %	0	Calculates percentage of under 18 and over 65 population in census block group Assigns average grid value to street centerline	Low 4/100
		15-35	25		
		35-40	50		
		40-43	75		
		43+	100		
Income - % below poverty level	Census 2010/ Polygons	0-.5 %	0	Calculates percentage of population below poverty level in census block group Assigns average grid value to street centerline	Low 4/100
		.5-1	20		
		1-2	40		
		2-3	60		
		3-4	80		
		4+	100		

TABLE B-1: LIST OF VARIABLES USED IN GIS PEDESTRIAN DEMAND MODEL					
Input factor	Source / Format	Range of Factor	Variable Score	Processing	Significance and Weighting Factor
Vehicle Ownership - % households with 1 or fewer vehicles	Census 2010/ Polygons	0-10 %	0	Calculates percentage of households with 1 or fewer vehicles in census block group Assigns average grid value to street centerline	Low 4/100
		10-20	20		
		20-30	40		
		30-40	60		
		40-50	80		
		50+	100		

Each weighted variable is combined into a single heat map for each jurisdiction (Calistoga, St. Helena, Yountville, City of Napa, American Canyon and the Unincorporated Areas) to identify the highest and lowest areas of pedestrian demand<sup>11</sup> within each area based on the composite score.

*Results*

The results of the Pedestrian Demand model are illustrated in the Pedestrian Index maps, *Exhibit 8* of each Jurisdiction Plan (Chapters 2-7), where the range of pedestrian demand across each jurisdiction is shown with a color gradient from dark purple to light green. Locations with a relatively high population or employment density and proximity to significant destinations immediately rise to the top and are given the highest scores, as shown in the darkest colors – black and purple. The lowest scores are found in the areas with low to no housing or employment and are represented in a pale green color. Since the majority of the data used in the PedINDEX comes from the Census (Census 2010 and the Smart Database), the data is applied at the Census block-level rather than an individual block-level, which can cause the resulting “heat” or colors of some of the maps to appear in large sections rather than on a finer-grained scale. Census blocks are polygons created around a cluster of blocks for which the results are reported for the entire group to address privacy concerns. The following findings stand out on the Demand exhibits for the jurisdictions.

Highest Pedestrian Demand Areas

High pedestrian demand areas are found in and around the downtown cores, close to important economic activity generators, and where schools and parks are located in areas with relatively dense population. The downtown cores have the highest concentration of destinations in the cities and town, including retail corridors and employment density. Most of the variables listed in Table 1 are found in the Downtown Core.

In American Canyon, the absence of a downtown core pulls the emphasis around other variables such as population density, schools and parks. For example, the area south of American Canyon Road to the east of SR 29

<sup>11</sup> This relative demand measure reflects latent demand, and does not account for the barriers that may prevent demand from being realized. Identifying and reducing these barriers is a key opportunity for this Plan to maximize demand.

includes American Canyon Apartments, a high-density housing complex, making it one of the higher concentrations of population in a city where the majority of housing is low-density single family homes. This relatively high population density, a variable ranked with high significance in the model, and the presence of multiple parks and schools nearby, both variables ranked with medium significance, make this an area of high pedestrian demand. Portions of The Preserve, Rancho Del Mar, and Napa Glen neighborhoods that are within walking distance of Donaldson Way Elementary School, American Canyon Middle School and multiple parks also receive a high pedestrian demand score.

Other high pedestrian demand areas are located in unincorporated areas in the center of the City of Napa or along the border of the city, and are shown in greater detail on *Exhibit UNC-8*, the Unincorporated Area Pedestrian Index. These areas are near multiple schools and parks as well as a mix of residential and commercial land uses. Parks and schools are both highly weighted in the model, so the proximity to both of these destinations increases pedestrian demand. The shorter blocks and more grid-like patterns of the road network in these unincorporated areas also result in a higher intersection density, which contributes to the high demand level.

#### Medium Pedestrian Demand Areas

Medium pedestrian demand areas are found farther from the core of the incorporated jurisdictions. Neighborhoods in these areas usually have a low mix of land uses but may have reasonably high population density, which is weighted with one of the highest significance factor among all 11 variables. They also are often relatively close to schools, parks, or the downtown area. For example, the residential area in the City of Napa east of Soscol Avenue and north of Lincoln Avenue, which includes Vineyard Terrace Apartments, Kentwood Apartments, and Glen View Garden Apartments, has a medium pedestrian demand score. This area has no employment centers and a low mix of land use; however, it does include medium-density housing, a park, and is within a half mile of a few other parks and schools. It is also adjacent to Soscol Avenue, a transit corridor for Vine Transit, with five bus stops bordering this area north of Lincoln Avenue.

The residential neighborhood in the City of Calistoga west of Lincoln Avenue between Grant Street and the northern city border is also a medium pedestrian demand area. This area borders Napa County Fairgrounds and includes several resorts and hotels. It is also adjacent to two schools - Calistoga Junior-Senior High School and Palisades Continuation High School – which are weighted with a high significance factor.

#### Low Pedestrian Demand Areas

Low pedestrian demand areas are found in portions of the jurisdictions with low population density, few destinations other than parks, and primarily residential land use (low land use mix). Areas near the outer edges of the cities and town and within the open space of the eastern unincorporated areas stand out for their low demand scores.

High Improvement Need

Barriers to Pedestrian Connectivity

Gaps in pedestrian infrastructure connectivity may result in barriers to pedestrian movement and discourage walking. Understanding where barriers exist within the countywide pedestrian network helps inform where improvements could be most beneficial. Examples of physical barriers include freeways or arterials with limited or difficult pedestrian crossings, such as SR 29.

The PedINDEX demand maps illustrate many high demand areas that exist near the key north-south physical barrier in the county, SR 29. New pedestrian connections can be prioritized in areas near barriers and a high pedestrian demand, such as potential enhanced crossings of SR 29 in St. Helena and Calistoga through the downtown areas. While the area between Eucalyptus Drive and American Canyon Road along SR 29 in American Canyon does not stand out in the PedINDEX demand maps with respect to existing development, areas of future development such as the Watson Ranch Town Center may be more telling of the need and location of potential pedestrian crossings.

Pedestrian Infrastructure Gaps

In addition to removing high priority barriers, the conditions of the physical infrastructure supporting walking, such as sidewalks, is an important consideration in identifying where improvements are needed. The Pedestrian Index maps include an overlay of gaps in the sidewalk network on top of the pedestrian demand results to visualize the interaction between these two variables. The flow chart below illustrates this concept by demonstrating how these two factors should work in conjunction to determine future needs for high demand areas. In general, places with high pedestrian demand and a high infrastructure need demonstrate target areas that could be prioritized for pedestrian improvements.



For example, the unincorporated County neighborhood located within the center of the City of Napa, called out on *Exhibit UNC-8*, has one of the highest demand scores in the unincorporated areas. A high concentration of the unincorporated population is in this area, which also has a high intersection density compared to the rest of the unincorporated areas. As seen on *Exhibit N-8a*, the neighborhood is also near multiple schools. Adding sidewalks or trails to this neighborhood, which currently lacks sidewalk coverage, could improve connectivity for school children and residents to ensure that any pedestrian demand is met with adequate facilities. The neighborhoods between Calistoga Junior-Senior High School and the Napa County Fairgrounds, two potential pedestrian destinations, present an additional opportunity for pedestrian infrastructure improvements. The grid pattern of the streets in this area contributes to a higher intersection density which drives the demand up in the model and provides good

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pedestrian connectivity to the two adjacent destinations. However, the lack of sidewalks and trails in this neighborhood, particularly between Grant Street and Fair Way, are a potential barrier to pedestrians and could be a candidate for improvements where speeds and traffic volume levels warrant.

### Collisions

Pedestrian collisions are an important consideration when determining where to invest in pedestrian improvements. Prioritizing locations with high latent demand that also have a high frequency of pedestrian-involved collisions can encourage more of the latent demand to be realized, rather than be inhibited due to potential safety issues. By focusing improvements on areas where these two variables overlap, cities can work towards removing collision hot spots as a barrier to walking and giving pedestrian demand the chance to fully realize. If effectively implemented and demand fully realized, improvements in these high-potential areas can result in a good return-on-investment scenario in terms of benefit/costs.

### Areas with Lower Pedestrian Demand

The information gathered from the GIS model provides a technical methodology for making informed decisions about areas which would most benefit from improvements. However, focusing improvements only on areas with highest pedestrian demand will not address all of the needs within the County. There may be areas, such as rural areas or streets around schools and senior centers, which have a lower pedestrian demand but would still benefit from pedestrian improvements.

Some areas may fit the low demand criteria for the PedINDEX demand maps and still be appropriate locations for a trail network, especially near parks in the eastern region of Napa County. Existing trails collected as part of the inventory in the *Countywide Napa Pedestrian Plan*, along with those available in GIS from jurisdiction staff, were overlaid on the PedINDEX maps to identify important investment opportunities related to potential areas of connectivity that the PedINDEX variables do not highlight.

### *Next Steps*

The pedestrian demand analysis was used to:

- Provide a point of comparison to the public comment maps to understand the interaction between latent pedestrian demand and public concerns
- Inform the selection of walk audit locations along with several other inputs

In addition, the pedestrian demand analysis may be used in the following ways:

- To guide the development of policies and programs relating to specific geographic areas, destinations, built environment factors and demographics
- To inform recommendations for pedestrian infrastructure and design guidelines, which can be tailored and context specific based on the built environment and areas of varying demand
- As a guide for prioritizing future Capital Improvement Program lists and other investments, in particular as it relates to removing barriers or deficiencies in high potential areas

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# Appendix C – Grant Funding Sources

## *Federal Programs*

The majority of public funds for bicycle, pedestrian, and trails projects are derived through a core group of federal and state programs. Federal funding is authorized through the Surface Transportation Program (STP). STP provides flexible funding that may be used by States and localities for projects on any Federal-aid highway. In the past this funding was authorized by the Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21). Funding for STP is now authorized through FAST Act, with the same structure and goals of STP funding.

The Transportation Alternatives Program (TAP), included in MAP-21 and maintained in the FAST Act, provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, transit access, mobility, and recreation trails program. TAP broadens eligibility and flexibility for state allocation of TAP funds. Safe Routes to School programs, including infrastructure, encouragement, campaigns, education, outreach and a Safe Routes coordinator, are eligible under TAP, though no funds are dedicated for this.

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) also authorizes federal funds, including education programs. FAST Act maintains the existing CMAQ program and broadens eligibility for transit operations.

Federal funds from STP, TAP and CMAQ programs are allocated to MTC and distributed in Napa County. Distribution is allocated either competitively or proportionally according to jurisdiction population.

## *State Programs*

Several state-wide funding sources and regionally administered funding sources are available for pedestrian projects and efforts.

### *Active Transportation Program*

The Active Transportation Program (ATP) was created by SB 99/ Assembly Bill 101 in 2013 to encourage increased use of active modes of transportation such as biking and walking. The program consolidates five existing state funded programs: Transportation Alternatives Program, Recreational Trails program, Safe Routes to Schools, Environmental Enhancement and Mitigation Program and the Bicycle Transportation Account. It provides a comprehensive program that improves planning and flexibility and is more efficient than multiple programs. Another benefit is that funds can be directed to multi-year projects to make greater long-term improvements to active transportation.

The ATP mixes state and federal funds and provides approximately \$130 million annually, with a focus on implementing active transportation improvements to support the goals of local SB 375 sustainable community strategies. This program is funded from a combination of federal and state funds from appropriations in the annual

state budget act. Forty percent of the funding will go toward metropolitan planning organizations in urban areas. Ten percent of the funds go to small urban and rural regions. The remaining fifty percent of the funds go to the California Transportation Commission for statewide projects. The ATP ensures that disadvantaged communities fully share in the benefits of the program by requiring that a minimum of 25% of fund be distributed to disadvantaged communities.

To maximize the effectiveness of program funds and to encourage the aggregation of small projects into a comprehensive bundle of projects, the minimum request for Active Transportation Program funds that will be considered is \$250,000. This minimum does not apply to non-infrastructure projects, Safe Routes to Schools projects, and Recreational Trails projects.

Project types allowed under the ATP include: new bikeways serving major transportation corridors, new bikeways to improve bicycle commuting options, bicycle parking at transit and employment centers, traffic control devices to improve pedestrian and bicycle safety, improving and maintaining safety on existing bikeways, recreational facilities, Safe Routes to School projects, Safe Routes To Transit projects, education programs, and other improvements to bicycle-transit connections and urban environments.

For a project to contribute toward the Safe Routes to School funding requirement, the project must directly increase safety and convenience for public school students to walk and/or bike to school. Safe Routes to Schools infrastructure projects must be located within two miles of a public school or within the vicinity of a public school bus stop. Other than traffic education and enforcement activities, non-infrastructure projects do not have a location restriction. More information on the Active Transportation Program can be found at <http://www.dot.ca.gov/hq/LocalPrograms/atp/>.

### *Highway Safety Improvement Program*

Caltrans administers two funding programs for roadway safety improvements: the Highway Safety Improvement Program (HSIP) and the Highway Rural Roads Program (HR3). These programs use cost-benefit ratios as a primary factor in the awarding of applications. Because both of these programs focus on roadway safety, projects with documented collision history – through frequency of collision but particularly collision severity – are typically ranked higher. Roadways with documented bicycle and pedestrian collision history, as discussed in Chapter 3 of this plan, may be well-qualified for HSIP and HR3 applications, particularly since many of the proposed projects would improve bicyclist and pedestrian safety at a lower cost than many of the highway projects also eligible under this funding source.

In its most recent grant cycle (November 2015), Caltrans awarded over \$160 million to 182 projects. While this funding source is often used for major roadway improvement projects, installation of traffic signals, and most other cost-intensive projects, funding has routinely been awarded to bicycle and pedestrian projects.

Successful projects have included:

- Median refuges and curb extensions

- Curb, gutter, and sidewalk
- Paved shoulders
- Upgraded traffic signals with pedestrian countdown signals and pedestrian-scale lighting
- Bicycle lane striping
- Crosswalk striping
- Roundabouts
- Rectangular rapid flashing beacon (RRFB) at crossings

Many of these projects were applied for as standalone bicycle and pedestrian improvement projects; some bicycle and pedestrian improvements were included with a broader package of roadway improvement projects. The average programmed federal funding amount was about \$880,000. The next call for projects, Cycle 8, is expected to be announced in April, 2016.

More information is available online:

<http://www.dot.ca.gov/hq/LocalPrograms/hsip.htm>

#### *Other Statewide Funding Programs*

Caltrans Sustainable Transportation Planning Grants are available to jurisdictions and can be used for planning or feasibility studies. The Division will award approximately \$9.8 million in funding for Fiscal Year 2016-17. The maximum funding available per project is \$300,000.

Limited amounts from the Local Transportation Fund (LTF), which is derived from a ¼ cent of the general sales tax collected statewide, can be used for bicycle and pedestrian facilities.

The California State Parks administers the state's Recreational Trails Program (RTP). RTP provides funds annually for recreational trails and trails-related projects. Cities are eligible applicants for the approximately \$5.3 million available annually. The program requires an applicant match of 12 percent of the total project cost.

The National Park Service and California State Parks administer the Land and Water Conservation Fund (LWCF). The LWCF Program provides matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities cities are eligible applicants. Approximately \$1.74 million is available annually; grants require a 50 percent local match.

Some of these programs will no longer be funded under proposed and current federal and state funding plans, and may only be short-term funding resources for the current schedule of projects. See below for proposed funding structures related to some of these programs.

### *One Bay Area Grant*

One Bay Area Grant Program (OBAG) is now an umbrella for the previous MTC grant programs. Administered by NVTA, it combines funding for Transportation for Livable Communities, Bicycle, Local Streets and Roads Rehabilitation, and Safe Routes to School. NVTA anticipates that Cycle 2 will cover FY 2017-18 through FY 2021-22. This program is administered by MTC and awards funding to counties based on progress toward achieving local land-use and housing policies. Cities and counties can still use OBAG funds for projects described under these programs.

MTC OBAG program information:

<http://www.mtc.ca.gov/funding/onebayarea/>

<http://www.nvta.ca.gov/one-bay-area-grant-obag>

### *Surface Transportation Program*

The Surface Transportation Program (STP) block grant provides FAST Act funding for transportation projects, including pedestrian and bicycle projects (see above discussion about Federal programs for details). This program is administered by MTC, which can prioritize projects for RSTP funding.

MTC STP program information:

<http://www.mtc.ca.gov/funding/STPCMAQ/>

### *Transportation Development Act, Article 3*

Transportation Development Act (TDA), Article 3 funds statewide funds for planning and construction of pedestrian and bicycle facilities administered locally through MTC. TDA, Article 3 funds are allocated based on population and may be used for engineering, right of way, construction, retrofitting, route improvements, and an assortment of bicycle facilities.

### *BAAQMD Transportation Fund for Clean Air (TFCA)*

Transportation Fund for Clean Air (TCFA) is a grant program administered by the Bay Area Air Quality Management District (BAAQMD). The purpose of the program, which is funded through a \$4 surcharge on motor vehicles registered in the Bay Area, is to fund projects and programs that will reduce air pollution from motor vehicles. Grant awards are generally made on a first-come, first-served basis to qualified projects. A portion of TFCA revenues collected in each Bay Area county is returned to that county's congestion management agency (CMA) for allocation (Napa Valley Transportation Authority in Napa County). Applications are made from local agencies directly to the CMAs, but must also be approved by the BAAQMD.

TFCA County Program Manager Fund: <http://www.baaqmd.gov/Divisions/Strategic-Incentives/Funding-Sources/TFCA/County-Program-Manager-Fund.aspx>

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## Appendix D – Best Practices Toolkit

This document outlines guidelines for the design of walking facilities in Napa County. Safe, walkable streets are a vital aspect of the pedestrian environment, and they enhance the health of communities. Well-designed walking spaces should be comfortable for all residents – of all ages and abilities – to enjoy.

### Creating a Walkable Network

A well-connected pedestrian network is a vital component of livable communities, which thrive on multimodal travel for all roadway users, regardless of age or ability. Multimodal travel incorporates the needs of not just motor vehicles in roadway design, but the needs of pedestrians, bicyclists, and transit users as well. The primary goal of the Best Practices Toolkit is to assist in creating streets Countywide that accommodate pedestrians through a set of recommended practices that enhance walkability. These practices are rooted in the larger concepts of Complete Streets and Traffic Calming, explained below.

#### Complete Streets

Complete streets accommodate safe access for all users, including pedestrians, bicyclists, transit riders, and motorists. A complete street is designed to make it easy for users of all ages and abilities to travel across and along the street. Complete street practices improve the pedestrian realm when properly integrated with the adjacent land use context, because they encourage the design of streets with well-connected and comfortable sidewalks, traffic calming measures to manage vehicle speeds and enhanced pedestrian crossings. Though the level of accommodation of all modes will vary in different land use contexts, incomplete streets—those designed primarily for automobile access—can be a barrier in any neighborhood, particularly for people with disabilities, older adults, and children.

#### Traffic Calming Best Practices

Traffic calming includes a suite of treatments designed to encourage safe, pedestrian-oriented speeds. Universal considerations for traffic calming along a pedestrian network can reduce the need for substantial and costly safety improvements in the future, such as large road diets or roundabouts. Considering the relationship between the design speed of a roadway and the desired speed, especially in the context of downtown locations and school zones, is an important first step to designing for a pedestrian-friendly environment. Examples of proactive traffic calming treatments include reduced lane widths, chicanes, and reduced curb radii. Reduced speeds from traffic calming can increase a driver's field of focus and attention to pedestrians that may be walking along or across the street. Additional design guidance is available on NACTO's website at: <http://nacto.org/publication/urban-street-design-guide/intersection-design-elements/visibility-sight-distance/> and in the *Treatment Guidelines* section. .

## The Pedestrian Realm

The pedestrian realm consists of walkways, pedestrian crossings, and open public spaces. The quality of the pedestrian realm has two components: accessibility and comfort.

These design guidelines will help each jurisdiction make decisions about the preferred application of pedestrian treatments in the following areas:

- Streets and Sidewalks
- Pathways/Trails
- Accessibility
- Crosswalk Guidelines for Uncontrolled and Controlled Crossings

The pedestrian enhancements described throughout these guidelines provide street design best practice guidance, which can enhance the safety, convenience, and mobility for pedestrians.

### *Streets and Sidewalks*

Streets and sidewalks should support the activities and pedestrian levels along the street. Streets should be well-connected to ensure that destinations are within walking distance and wide enough to support the expected pedestrian volumes.

### Sidewalk Zones

The application of sidewalks varies throughout Napa County. In some jurisdictions and within the unincorporated County where sidewalks may be cost-prohibitive and/or conflict with the desired rural character of the area, lower-cost alternatives should be considered as discussed below. Other more urban areas of the County include sidewalks that are built to specified minimum widths found in the standard street cross-sections for the jurisdiction where they are located and may vary depending on land use. **Table D-4** of the *Treatment Guidelines* section below provides guidelines on the design of organized sidewalk zones that meet walking demand and provide comfort to users.

### Alternatives to Sidewalks

While many of the guidelines outlined here are appropriate in downtown or more urbanized locations, many of the roadways throughout the County are rural, especially in unincorporated areas, and some of the sidewalk guidelines are either not feasible or not a contextual fit. In these instances, pedestrian facilities (where warranted) can be provided through the use of paved multi-use shoulders, unpaved shoulders or pathways. The feasibility of most of these treatments will depend on available right-of-way and should be evaluated when certain general criteria are met, discussed below under *Considerations for Sidewalk and Shoulder Installation*. For additional design guidance on paved multi-use shoulders, see **Table D-10** of the *Treatment Guidelines* section. For design

guidance on pathways and trails, including materials that have been tested in rural settings for ADA applications, refer to the Pathways/Trails section below.

### *Considerations for Sidewalk and Shoulder Installation*

Many rural roadways present engineering and cost challenges for pedestrian facilities due to steep terrain or narrow right-of-way. As such, a three step process for determining applicable facility types and locations is recommended: (1) collect contextual data, (2) evaluate data versus thresholds, and (3) select facility type.

#### Context

The appropriate location for pedestrian facilities, especially in rural contexts such as the unincorporated areas of Napa County, depends on several factors related to the potential for pedestrian demand including presence of pedestrian-oriented land uses (such as retail, schools or parks), presence of transit, and/or observed pedestrian volumes. More importantly, sidewalks are a documented safety countermeasure<sup>12</sup>, and therefore should first be prioritized in locations where pedestrian-vehicle collisions have been recorded with a “walking along the roadway” crash type or there are reported safety concerns, independent of land use or other factors. In cases with no pedestrian demand and no documented safety concerns (reported or anecdotal), designated pedestrian facilities may not be required in a rural context.

#### Thresholds and Facility Selection

If pedestrian facilities are merited based on the contextual factors, the type of facility is determined based on the land use, vehicle volumes, and density of development. **Table D-1** below, developed for the FHWA, Office of Safety as part of the Pedestrian Safety Guide and Countermeasure Selection System, should be used as a resource to determine the appropriate type of pedestrian facility for the corridor.

While the table is intended to assist in the evaluation of existing conditions, future volumes and housing densities should also be considered to determine whether right-of-way should be preserved or secured in anticipation of sidewalks being warranted under a future condition.

TABLE D-1: RECOMMENDED GUIDELINES FOR NEW SIDEWALK/WALKWAY INSTALLATION	
Volume and Housing Density Thresholds by Land Use	Minimum and Preferred Sidewalk/Walkway Treatment
<b>Rural</b>	
Roadways with < 400 ADT	Shoulders preferred, with minimum of 3 ft.

<sup>12</sup> Zegeer, Charles V., Dan Nabors, Peter Lagerwey, “Pedestrian Safety Guide and Countermeasure Selection System”, [http://www.pedbikesafe.org/PEDSAFE/countermeasures\\_detail.cfm?CM\\_NUM=1](http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=1)

**TABLE D-1:  
RECOMMENDED GUIDELINES FOR NEW SIDEWALK/WALKWAY INSTALLATION**

Volume and Housing Density Thresholds by Land Use	Minimum and Preferred Sidewalk/Walkway Treatment
Roadways with 400 to 2,000 ADT	5-ft shoulders preferred, minimum of 4 ft required.
<b>Rural / Suburban</b>	
Roadways with ADT > 2,000 and less than 1 dwelling unit (d.u.) / acre	Off-street facility preferred (sidewalks or side paths <sup>1</sup> ).  Minimum of 6-ft shoulders required. Paved shoulders are preferred to unpaved shoulders to provide an all-weather surface.
<b>Note: In rural settings, greater width shoulders (up to 8 to 10 feet) are desired along high-speed roadways, particularly with a large number of trucks.</b>	
Roadways with 1 to 4 d.u. / acre	Sidewalks on both sides required unless side path provided.
<b>Suburban / Urban Residential</b>	
Non-Local Streets (i.e. major arterials, collectors, and minor arterials)	Sidewalks on both sides required.
Local streets with less than 1 d.u. / acre	Sidewalks on both sides preferred. Minimum of 5-ft shoulders required.
Local streets with 1 to 4 d.u. / acre	Both sides preferred.  Second side recommended if density becomes greater than 4 d.u. / acre or if schools, bus stops, etc. are added.
Local streets with more than 4 d.u. / acre	Sidewalks on both sides required.
<b>Urban Commercial</b>	
<b>All Commercial Urban Streets</b>	Sidewalks on both sides required.
<b>Industrial</b>	
<b>All Streets in Industrial Areas</b>	Sidewalks on both sides preferred. Minimum of 5-ft shoulders required.

<sup>1</sup> Side path is a pathway separated from the travel way; an off-street pathway. It may be paved or unpaved, and is separated from the roadway by a grass or landscape strip without curbing.

Source: Zegeer, Charles V., Dan Nabors, Peter Lagerwey. "Recommended Guidelines/Priorities for Sidewalks and Walkways," Pedestrian Safety Guide and Countermeasure Selection System, August 2013.

### Pathways/Trails

Pedestrian pathways, which include paved multi-use trails as well as informal, unpaved trails, are an asset to Napa County. They increase pedestrian connectivity and satisfy pedestrian desire lines that are otherwise not accommodated by pedestrian facilities. The design of a trail segment should accommodate users walking in both directions when possible. A pathway can be direct, especially when providing a useful connection between two pedestrian generators, or if the primary purpose is recreational they can meander and take advantage of natural landscape features such as creeks and open space. Perhaps the most important consideration for pedestrian safety in the design of trails is crossing locations. Refer to the Crosswalk Guidelines of this Appendix for applicable treatments based on locational context.

### Unpaved Pathway/Trail Accessibility

Trails and unpaved pathways/shoulders should provide access to pedestrians of all abilities. According to the *Best Practices Design Guide for Designing Sidewalks and Trails for Access*, a guidebook published by the FHWA, the surface material for a trail should be firm and stable to satisfy accessibility requirements. Many natural materials can provide a firm and stable surface, as shown in **Table D-2** below. Slip resistance is also desirable although not always achievable. More information on accessible trail design is available in Chapter 15 of the FHWA guidebook, *Recreational Trail Design*, which can be viewed at the following link:

[http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/sidewalk2/pdf/16chapter15.pdf](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/pdf/16chapter15.pdf).

**TABLE D-2: FIRMNESS, STABILITY, AND SLIP RESISTANCE FOR A VARIETY OF COMMON TRAIL SURFACING MATERIALS**

Surface Material	Firmness	Stability	Slip Resistance (dry conditions)
Asphalt	Firm	Stable	Slip resistant
Concrete	Firm	Stable	Slip resistant*
Soil with Stabilizer	Firm	Stable	Slip resistant
Packed Soil without Stabilizer	Firm	Stable	Not slip resistant
Soil with High Organic Content	Soft	Unstable	Not slip resistant
Crushed rock (3/4" minus) with Stabilizer	Firm	Stable	Slip resistant
Crushed rock without Stabilizer	Firm	Stable	Not slip resistant
Wood Planks	Firm	Stable	Slip resistant
Engineered Wood Fibers that comply with ASTM F1951	Moderately firm	Moderately stable	Not slip resistant
Grass or Vegetative Ground Cover	Moderately firm	Moderately stable	Not slip resistant
Engineered Wood Fibers that do not comply with ASTM F1951	Soft	Unstable	Not slip resistant
Wood Chips (bark, cedar, generic)	Moderately firm to soft	Moderately stable to unstable	Not slip resistant
Pea Gravel or 1-1/2" Minus Aggregate	Soft	Unstable	Not slip resistant
Sand	Soft	Unstable	Not slip resistant

\* A broom finish significantly improves the slip resistance of concrete.

Source: *Designing Sidewalks and Trails for Access*, Part II of II: *Best Practices Design Guide*, FHWA, 2001  
[http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/sidewalk2/pdf.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/pdf.cfm)

### Accessibility

The United States Access Board published proposed accessibility guidelines for pedestrian facilities in the public right-of-way in 2011 which have yet to be adopted formally into law. The most recent information can be found on the Board's website at [www.access-board.gov/prowac/](http://www.access-board.gov/prowac/). These guidelines represent best practices and should be referenced when constructing new curb ramps and sidewalks to ensure accessibility for users of all abilities. FHWA

has also published *Designing Sidewalks and Trails for Access*, which includes guidance for designing accessible sidewalks and curb ramps. Relevant sections include Chapter 4 *Sidewalk Corridors*, Chapter 5 *Driveway Crossings* and Chapter 7 *Curb Ramps*. A summary of key specifications is included below in **Table D-3**. Additional guidance for surveying curb ramps can be found in the ADA Best Practices Toolkit for State and Local Governments, published by the United States Department of Justice, at <https://www.ada.gov/pcatoolkit/app1curbramps.htm>.

**TABLE D-3: ACCESSIBILITY GUIDANCE FOR SIDEWALKS AND CURB RAMPS**

Sidewalks	
Maximum running slope	5% <sup>1</sup>
Maximum cross-slope	2%
Minimum clear width at obstructions	3 feet
Minimum clear height at obstructions (includes signs placed on sidewalk)	7 feet
Surface	Firm, stable and slip resistant
Minimum vertical changes in elevation	0.25 inches

*Note: Level landings should be provided at the back of sloped driveways to prevent abrupt changes in cross-slopes and accommodate wheelchairs*

Curb Ramps	
Maximum ramp slope	8.33%
Maximum gutter slope	5%
Minimum ramp width	36 inches; 48 inches desired
Minimum landing width	48 inches
Maximum flare slope	10%
Maximum cross slope	2%
Detectable warning width	24 inches

*Note: Abrupt changes in elevation at the top or bottom of a curb ramp should be avoided. Two separate curb ramps should be provided at corners when possible, one for each crosswalk, to provide directional guidance to vision-impaired pedestrians.*

1: Except where the grade of the existing street exceeds 5%. Level landings should be provided at regular intervals in these cases.

Source: *Designing Sidewalks and Trails for Access*, Part II of II: *Best Practices Design Guide*, FHWA, 2001

[http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/sidewalk2/pdf.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/pdf.cfm)

Accessible Elements of a Curb Ramp

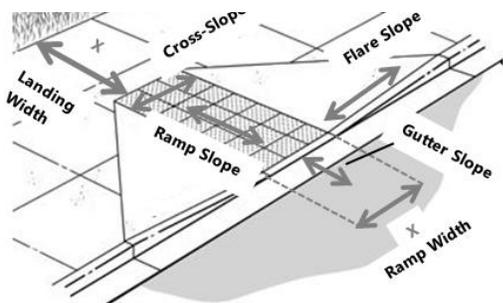


Image Source: <https://www.ada.gov/pcatoolkit/app1curbramps.htm>  
 Annotations: Fehr & Peers 2016

Accessible Elements of a Sidewalk

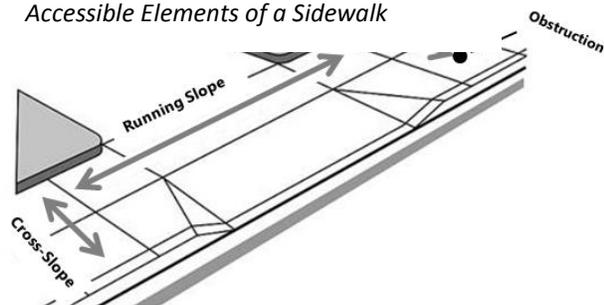
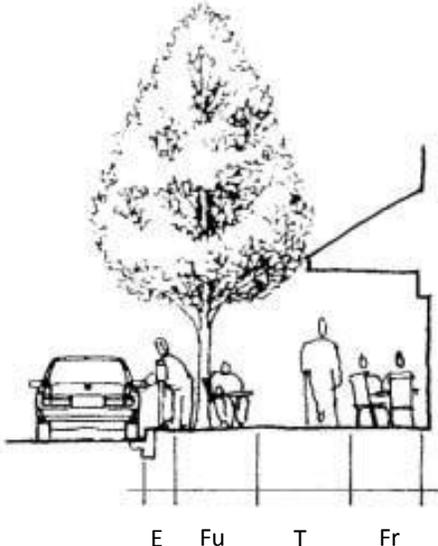


Image Source: <http://www.ite.org/css/online/DWUT08.html>  
 Annotations: Fehr & Peers 2016

## Additional Treatment Guidelines

Table D-4: Sidewalk Zones and Corners

Description
<p>The sidewalk zone is the portion of the street right-of-way between the curb and building front. Within this zone, four distinct areas serve different organizational purposes.</p>
Design Example
<div style="display: flex; align-items: center;">   </div> <p>E Fu T Fr</p> <p>E = Edge Fu = Furnishings T = Throughway Fr = Frontage</p>
Design Summary
<p>Where right-of-way allows, sidewalks should be separated from vehicle lanes by a landscaped buffer. In addition to separating pedestrians from vehicle traffic, landscape buffers provide space for driveway curb cuts and reduce cross-slopes on sidewalks.</p> <p>Wider sidewalks can accommodate more pedestrians and further buffer pedestrians from vehicles. In busy pedestrian areas such as downtowns and school areas, sidewalks wider than 6' should be considered. These sidewalks could include wider landscaped buffers, a pedestrian pathway, and/or vegetative strips along the building face. Elements such as street furniture, newspaper racks, bicycle parking racks, and trash bins should be kept in the furniture zone and should not impede a straight travel path along the sidewalk. Additionally, "meandering" sidewalks, as opposed to straight sidewalks, should be avoided since they are inconvenient for pedestrians and are challenging for disabled users.</p>

- Edge/Curb Zone is the transition between the sidewalk and the road.
- Furnishing/Landscape Zone 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. Streets with higher speeds should have larger furnishing zones.
- Throughway Zone provides enough space for pedestrians to travel.
- Frontage Zone 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.

Some zones are more important in specific settings; for example, most residential streets will not include a frontage zone and will only include a furnishing/landscape zone on streets with higher speeds.

These guidelines are nationally supported, and more information is available on the NACTO website: <http://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/>

#### Pedestrian Area at Corners

Corners must be functional and must accommodate those waiting to cross the street, those traveling along the sidewalk, and those who stop to congregate on the corner. The greater the number of expected pedestrians, the larger the pedestrian area should be. Other considerations sometimes erode the amount of usable space and hence the functionality of corners. Several strategies exist for expanding the pedestrian area at corners. Small corner radii generally provide the most usable space and the shortest crossing distances for pedestrians. Designers may also consider curb extensions, right-of-way acquisition, public easements across private property to expand the pedestrian area.

The pedestrian area should be clear of obstructions, especially in the triangle created by extending the property lines to the face of curb. Where existing obstructions such as utility poles or newspaper racks are removed, they should not be relocated such that they obstruct a pedestrian's line of travel.

The general rule for choosing a corner radius should be to choose the smallest possible, acknowledging that each location has a unique set of factors that determines the appropriate radius. Small corner radii improve comfort, and create a more enjoyable walking environment because they create more usable space for pedestrians at the corner. They improve safety because they slow vehicle speeds and shorten the crossing distance for pedestrians and improve sightlines. Smaller corner radii are also beneficial for street sweeping operations.

The County may choose to recommend specific corner radii based on roadway classification, presence of curbside parking and heavy truck or transit traffic.

*Image Sources: Valley Transportation Authority Pedestrian Technical Guidelines; Chula Vista Pedestrian Master Plan; Fehr & Peers*

Table D-5: Pedestrian Wayfinding

Description
<p>A pedestrian wayfinding system provides consistent and user-friendly information about distances and routes to and from major transit centers and popular destinations, making these places easier to connect to, and encouraging people to make short trips on foot. Signs that explain pedestrian directions and summarize route distances make for a more enjoyable and comfortable walking experience. Wayfinding is an essential aspect of street infrastructure which makes pedestrians a priority within the streetscape and enhances the character of the street.</p>
Design Example
<p>Wayfinding (Napa and Yountville examples)</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>
Design Summary
<p>Wayfinding signage should cater to both vehicles and pedestrians, particularly in districts with high levels of walking activity. Signs and routes that direct pedestrians to specific destinations are key to providing adequate wayfinding for pedestrians.</p>

Image Source: [lajollalight.com](http://lajollalight.com) (left); Fehr & Peers (right)

Table D-6: Pedestrian-Scale Lighting

Description
<p>Pedestrian-scale lighting improves pedestrian visibility and the perception of safety and comfort while walking. Well-lit pedestrian facilities are more inviting, and function well for pedestrians after sunset.</p>
Design Example
<p>Pedestrian-scale Lighting (South San Francisco and Calistoga)</p> 
Design Example
<p>Pedestrian-scale lighting provides a better-lit environment for pedestrians while improving visibility for motorists. Sidewalks with frequent nighttime pedestrian activity particularly in the downtown area should have pedestrian lighting. All crosswalks should have pedestrian-scale lighting. Pedestrians tend to observe more details of the street environment since they travel at a slower pace than vehicles, and thus pedestrian-scale lighting should have shorter light poles and shorter spacing between posts. A height of 12- 20 feet is common for pedestrian lighting. The level of lighting should reflect the location and level of pedestrian activity. Pedestrian visibility needs and a desire in rural areas for starlit sky views can require tradeoffs in lighting decisions. Lighting requirement decisions in these situations should be documented for consistent implementation.</p>

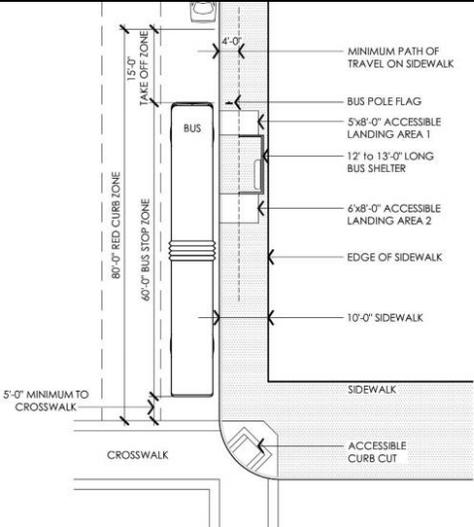
Image Source: Fehr & Peers and Seattle.gov

Table D-7: High-Quality Street Furniture

Description
<p>High-quality street furniture provides pedestrians with inviting places to rest, and clearly defines the furnishings zone of a sidewalk. Street furniture enhances the streetscape with consistent design character, can protect landscape features, and formalizes waiting areas such as bus stops and street corners.</p>
Design Example

Design Summary
<p>Street furniture is normally placed on a sidewalk in the Frontage Zone to provide comfort for pedestrians and enhance place making within the pedestrian realm. Street furniture makes pedestrians feel welcome, but should not conflict with the pedestrian travel path. Street furniture can include benches, specially designed newspaper racks, fountains, special garbage/recycling containers, etc.</p>

Table D-8: Bus Stop Accessibility

Description
<p>The specific location and design of a bus stop within the right-of-way and pedestrian facilities are important for bus operations and accessibility. The best bus stops are operationally safe and efficient for both buses and passengers. The stop should be located to cause the minimum interference with pedestrian, bicycle and other vehicle movements. Bus stops should be located adjacent to the street curb in most cases, or at a bus bulb along busy transit routes or at transit centers and hubs. Minimum sidewalk and clearance is required for ADA accessibility. Ideally, bus stops also include a bus shelter for protection from sun or rain, and other amenities; at minimum they should include a bus stop pole and ADA compliant bench.</p>
Design Example
<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  </div> <div style="flex: 1;">  <p style="text-align: right;"><i>Bus</i></p> </div> </div> <p><i>shelter with bench at back of sidewalk, leaving adequate ADA compliant clearance at curb.</i>  <i>Image Source: <a href="http://www.actransit.org">www.actransit.org</a>, <a href="http://napavalleyregister.com">napavalleyregister.com</a></i></p>
Design Summary
<p>Bus stops must be long enough for the buses that use them so the buses do not hang into the travel lane when pulling in to the bus stop. Buses must stop flush with the curb to provide ADA compliant access to passengers with disabilities. Bus stop dimensions should be coordinated with the appropriate transit agencies.</p> <p>ADA Accessibility Guidelines (ADAAG) specifies that the paved boarding/alighting area must be at least eight feet deep from the curb and five feet along the curb. ADAAG also requires a minimum path of travel (sidewalk) clear of obstructions to and from this boarding area at least three feet wide. Many cities use four feet or even six feet as their standard.</p> <p>In most cases bus shelters should be placed at the back of the sidewalk in order to maintain pedestrian travel and meet ADA path of travel requirements. Exceptions are made and placement must consider security and line of sight at intersections and driveways.</p>

Concrete bus pads can be used at bus stop locations to prevent and minimize pavement wear and maintain level grade at locations with heavy bus traffic.

These guidelines are nationally supported, and more information is available on the NACTO website: <http://nacto.org/publication/urban-street-design-guide/street-design-elements/transit-streets/bus-stops/>

**Table D-9: Pedestrian Accommodations at Interchanges**

Description
<p>The Institute of Transportation Engineers (ITE) has drafted a new recommended practice: <i>Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges</i>. These guidelines provide best practices in accommodation of all modes through interchanges to enhance pedestrian and bicycle safety, connect pedestrian and bicycle facilities efficiently with surrounding land uses, and provide a consistent message. Napa County communities should follow guidance presented in this guide when designing or modifying interchanges. Guiding principles for pedestrians facilities include:</p> <ul style="list-style-type: none"> <li>• Provide pedestrian facilities to safely and efficiently accommodate pedestrians.</li> <li>• Design ramp geometries in ways that encourage slower vehicle speeds until past the pedestrian crosswalk (as illustrated in the design example below).</li> <li>• Locate the crosswalk at the location with the best visibility and before the point where vehicles begin to accelerate (as illustrated in the design example below).</li> <li>• Crosswalks should be designed to be as short as possible, but without deviating excessively from pedestrian desire lines. For long crosswalks, median pedestrian islands should be considered, as they can improve signal timing while making a long crossing less daunting for pedestrians.</li> <li>• Crosswalk Policies developed by each jurisdiction can be used to select appropriate crossing treatments. Treatments range from standard tools such as traffic signal and median pedestrian islands to advanced devices such as the High-Intensity Activated Crosswalk beacon (HAWK or Hybrid) and the rectangular rapid flashing beacon (RRFB).</li> </ul>

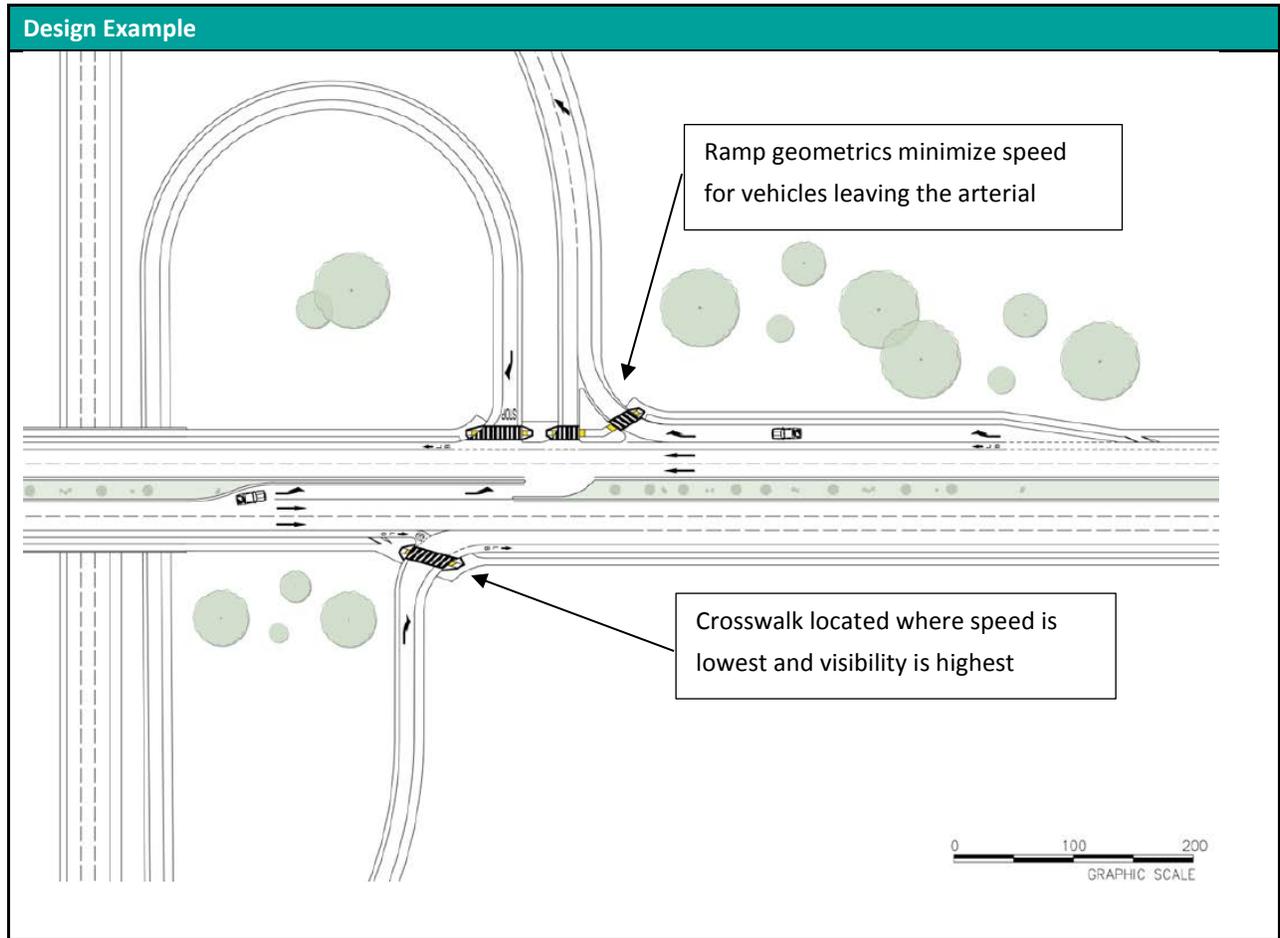


Image Source: ITE Recommended Practice: Design Guidelines to Accommodate Pedestrians and Bicyclists at Interchanges.

Table D-10: Multi-Use Shoulders (Paved or Unpaved)

Description
<p>Where sidewalks are not feasible, a multi-use shoulder can improve the pedestrian experience, providing a space for bicyclists and pedestrians adjacent to the travel lane. Where feasible and especially when speeds or truck volumes are high, eight to ten-foot shoulders in each direction provides ample space for both bicyclists and pedestrians to get to their destinations and a higher level of pedestrian comfort. Guidance for minimum shoulder widths are provided in Table D-1.</p>
Design Example
<p><u>Wide shoulders</u> <i>Eight to ten foot paved shoulders can provide space for both bicyclists and pedestrians outside of the travel way.</i></p>  <p>The image contains two side-by-side photographs. The left photograph shows a paved road with a wide shoulder on the left. Several people are walking along the shoulder, away from the camera. The road has a white line marking and a yellow curb. The right photograph shows a paved road with a wide shoulder on the right. A group of about six people, including children and adults, are walking along the shoulder towards the camera. The road has a white line marking and a yellow curb. The background of both photos shows trees and a clear sky.</p>

**Enhanced Walkways**

*Enhanced multi-use shoulders are particularly appropriate where dedicated space is desired in rural contexts, such as in school-adjacent neighborhoods.*



*Existing - roadways with no sidewalks or designated walkways*



*Edgelines added*



*Edgelines and stamped, colorized asphalt added*

*Image Sources: FHWA (first), City of Walnut Creek Design Guidelines, Fehr & Peers (second)*

## Crosswalk Guidelines



### Introduction

These Crosswalk Guidelines are aimed at improving pedestrian safety and enhancing pedestrian mobility. A comprehensive pedestrian safety strategy contains a three-pronged approach of engineering, enforcement, and education programs. This document focuses on engineering elements, such as pedestrian crossing treatments and intersection design.

This document describes the function of crosswalks and their legal context in the California Vehicle Code. It discusses the advantages and disadvantages of marked crosswalks and summarizes research in the United States focused on pedestrian safety and marked crosswalks. It provides a summary of best practices related to numerous pedestrian treatments, including geometric, signage and striping, and signal hardware or operational measures.

The purpose of these Guidelines is to enable the City to respond to crosswalk requests in a manner that improves pedestrian accessibility and maintains public safety. It provides information to be used when making decisions about where standard crosswalks (two, parallel white stripes) can be marked; where crosswalks with special treatments, such as high-visibility crosswalks, flashing beacons and other special features, should be employed; and where crosswalks will not be marked due to volume, speed, or sight distance considerations.

## Crosswalk Fundamentals

Pedestrian crossing and right-of-way laws vary state to state, and are often a source of driver or pedestrian uncertainty and confusion for when crossing is legal. This section outlines the types of crosswalks, where crossing the street is legal in California, and guidance for identifying locations for marked crosswalks.

### Types of Crosswalks

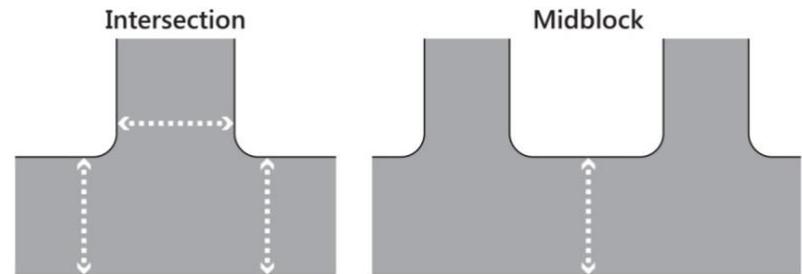
Crosswalks are primarily classified by three characteristics:

1. Whether they are marked (demarcated with striping on the street) or unmarked (no striping)
2. Whether they are controlled (by a traffic signal or stop-sign) or uncontrolled (with no intersection control)
3. Whether they are located at an intersection (where two streets meet) or mid-block (between intersections)

The following section outlines where crossing the street is legal in California. It also discusses key safety research regarding crosswalk markings and locational context..

### Where Is Crossing the Street Legal?

In California, a legal crosswalk exists where a sidewalk meets a street, regardless of whether the crosswalk is marked (i.e., with or without striping to denote the crosswalk). Pedestrians may legally cross any street except at unmarked locations between immediately adjacent signalized



crossings, or where crossing is expressly prohibited. Marked crosswalks reinforce the location and legitimacy of a pedestrian crossing and clarify pedestrian right-of-way at midblock locations.

These legal statuses are contained in the California Vehicle Code (CVC) as follows:

- Section 275 defines a legal crosswalk as:
  - That portion of a roadway included within the prolongation or connection of the boundary lines of sidewalks at intersections where the intersecting roadways meet at approximately right angles, except the prolongation of such lines from an alley across a street.

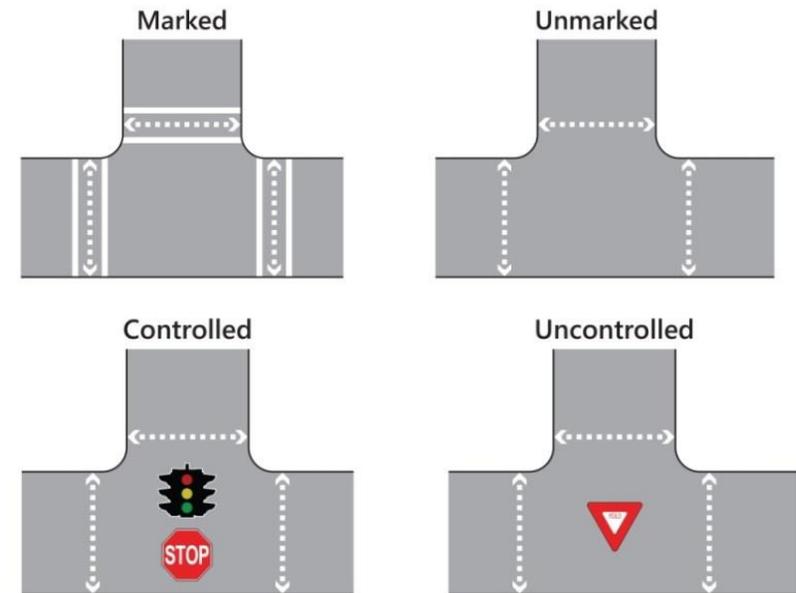
- Any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface.
- Section 21950 describes right-of-way at a crosswalk:
  - The driver of a marked vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection.
- Section 21955 describes where pedestrians may *not* cross a street:
  - Between adjacent intersections controlled by traffic control signal devices or by police officers, pedestrians shall not cross the roadway at any place except in a crosswalk.

### Why Mark Crosswalks?

Sidewalks and crosswalks are essential links within a pedestrian network. Whether commuting, running an errand, exercising, or wandering, pedestrians will need safe and convenient crossing opportunities to reach their destinations. A marked crosswalk has three (3) primary functions:

- 1) To create reasonable expectations where pedestrians may cross a roadway
- 2) To improve predictability of pedestrian actions and movement
- 3) To channel pedestrians to designated crossing locations (often selected for their optimal sight distance)

### Advantages of Marked Crosswalks



Marked crosswalks offer the following advantages:

- They help pedestrians find their way across complex intersections
- They can designate the shortest path
- They can direct pedestrians to locations of best sight distance
- They assure pedestrians of their legal right to cross a roadway at an intersection or mid-block crossing

This last bullet point is important. The *California Vehicle Code* gives the right-of-way to pedestrians at any marked or unmarked crosswalk (as noted above), although the law is not always obeyed by road users,

including both drivers and pedestrians. Drivers often fail to yield the right-of-way without the visual cue of a marked crosswalk. Pedestrians also do not always know the right-of-way law, and will either wait for a gap in traffic, or assert their right-of-way by stepping into the roadway.

### Steps to Identify Candidate Locations for Marked Crosswalks at Uncontrolled Locations

Identifying candidate locations for marked crosswalks involves two steps.

The first step is to locate the places people would like to cross the street. These locations are called *pedestrian desire lines*, which represent the most desirable, and typically most direct, places that people want to cross a street. Pedestrian desire lines are influenced by elements of the roadway network, such as transit stops, and nearby land uses (homes, hotels, schools, parks, trails, commercial centers, wineries, etc.). This information provides a basis for identifying pedestrian crossing improvement areas and prioritizing such improvements, thereby creating a convenient, connected, and continuous walking environment.

The second step is to identify where people can cross safely. The primary consideration in this step is adequate stopping sight distance.

Once candidate locations are identified, an engineering evaluation should be conducted to determine if a marked crosswalk should be installed at an uncontrolled or mid-block location, and if so, what visibility enhancements should be included in the design. Crossings should be marked where all of the following occur:

- Sufficient demand exists to justify the installation of a crosswalk
- Sufficient sight distance as measured by stopping sight distance calculations exists and/or sight distance will be improved prior to crosswalk marking
- Safety considerations do not preclude a crosswalk

**Figures A-1** and **A-2** describe the overall procedures from the moment City staff receives a request for a new marked crosswalk (or considers removing an existing marked crosswalk) to the installation of the treatment. As described, the first steps to determine the appropriate location and treatment for the crosswalk include a staff field visit.

Figure A-1: Uncontrolled Marked Crosswalk Placement

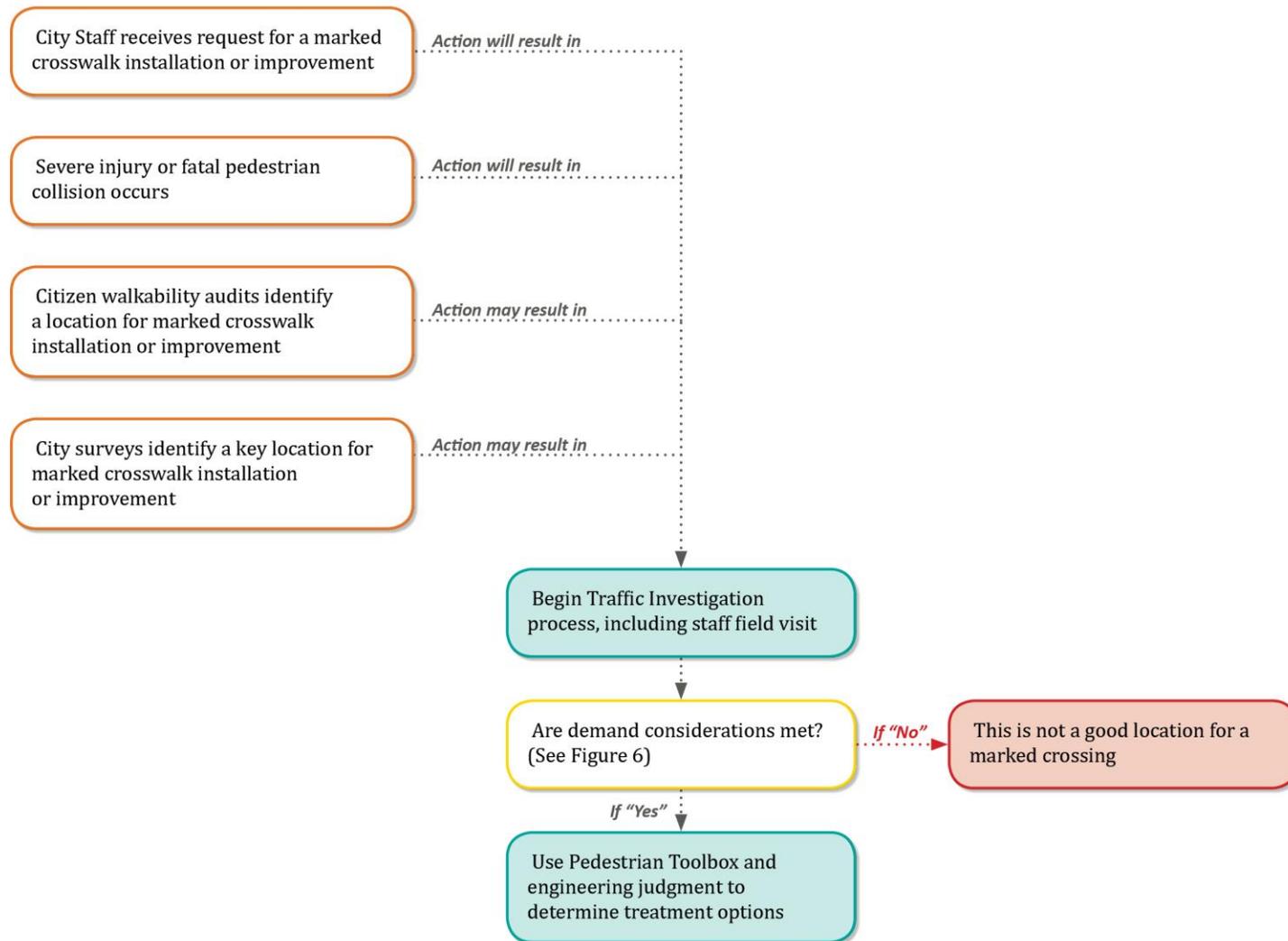
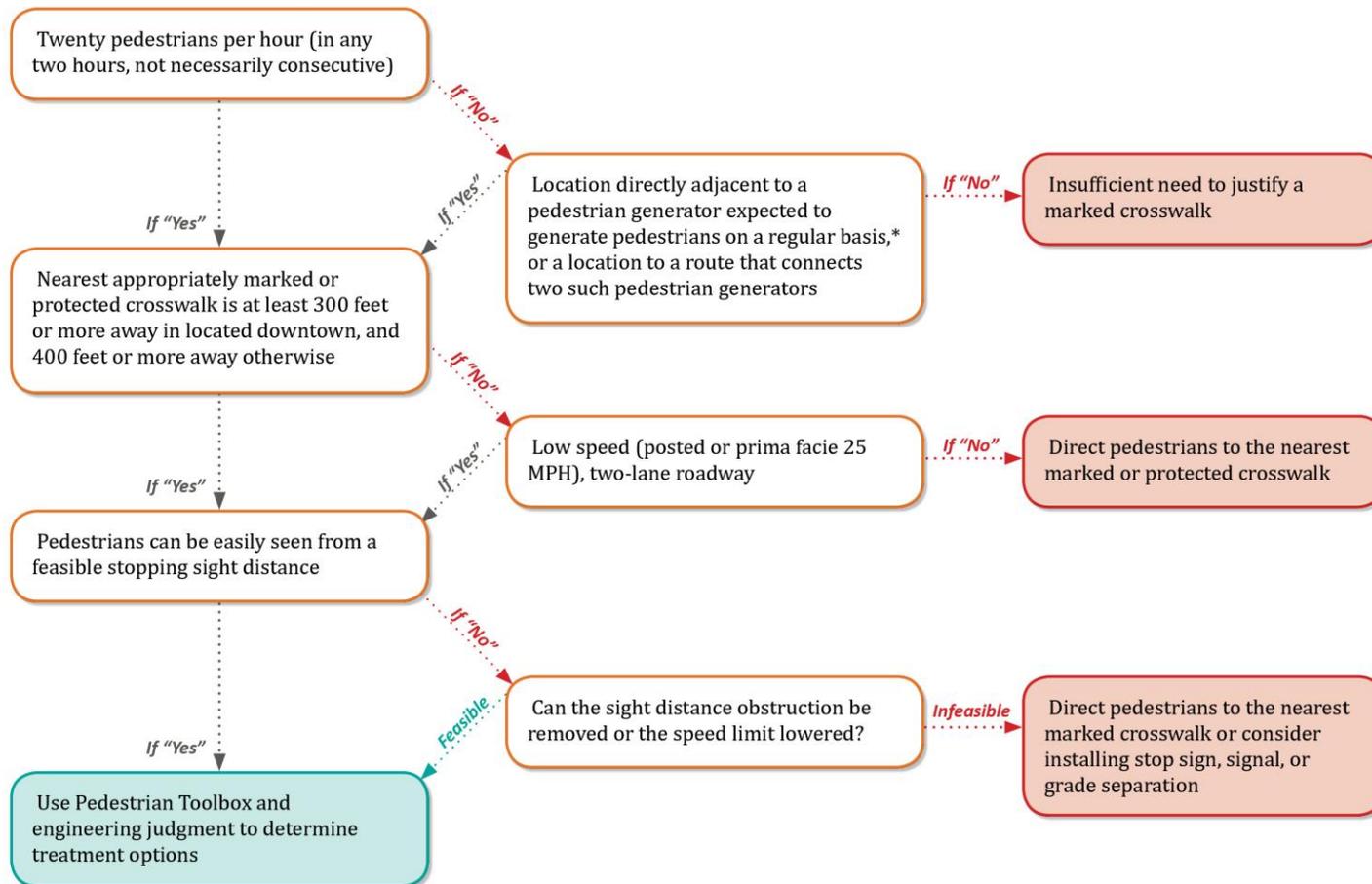


Figure A-2: Feasibility Analysis for Treatments at Uncontrolled Locations



\* **Note:** Where a marked crosswalk is not necessary based on Figure A-2, other treatment options are available. These include traffic calming measures, such as speeds tables and speed humps; curb extensions and refuges to narrow the roadway, speed feedback signs, and similar treatments to help reducing crossing distances and slow speeds. These engineering treatments are described in the following pages. In addition to engineering treatments, education and enforcement programs should be considered.

**Example pedestrian generators:** School, Hotel, restaurant, winery, park, bus stop, or hospital. For locations without pedestrian counts, consider whether location is directly adjacent to one of these generators a pedestrian generator such as a school, hotel, restaurant, winery, park, bus stop, or hospital and is expected to generate pedestrians on a regular basis, or is located on a route that connects two such pedestrian generators.

## Uncontrolled Crossing Enhancement Toolbox

This section presents best practices for the installation of marked crosswalks at uncontrolled intersections and mid-block locations. Uncontrolled crossings require additional consideration during planning and design as drivers must recognize the pedestrian and yield accordingly. Thus, providing appropriate enhancements to improve the visibility and safety of pedestrians crossing the street at an uncontrolled location is critical.

### Crosswalk Safety Research

Several studies of pedestrian safety at uncontrolled crossings have been completed, from which conflicting research has at times emerged. Studies conducted in San Diego in the 1970s showed that pedestrian collision risk at marked, uncontrolled crosswalks was greater than at unmarked crossings. This led many cities to remove marked crosswalks, as they were suspected of providing a false sense of security that drivers would yield to pedestrians in the crosswalk. However, a more recent study<sup>13</sup> by the Federal Highway Administration (FHWA) comprehensively reviewed crossing safety at 1,000 marked and 1,000 matched unmarked crosswalks in 30 U.S. cities, controlling for site context factors. The study concluded

<sup>13</sup> Zeeger, C., J. Stewart, and H. Huang. *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations*. Publication FHWA-RD-01-142, FHWA, U.S. Department of Transportation, 2001.

### Mid-Block Crossings

Crosswalks can be marked at intersections and mid-block points. Mid-block crossings play an important role for pedestrian access; without mid-block crossing locations, pedestrians may face the undesirable choice to detour to a controlled crossing location, detour to an intersection where crossing is legal even if not controlled, or cross illegally (if the midblock crossing is between two signalized intersections). Where signals are spaced far apart (generally more than 600-800 feet), pedestrians may have to detour several minutes to a controlled crossing location. Pedestrians are more likely to wait for a gap in traffic and cross at an unmarked location, rather than travel a distance out of their way to find a marked crosswalk. Mid-block crossings also offer an important safety consideration: fewer potential conflict points between pedestrians and motorists.

that site factors related to pedestrian-involved collisions included pedestrian average daily traffic (ADT), vehicle ADT, number of lanes, median type, and the region of the U.S. At uncontrolled locations on two-lane roads and multi-lane roads with ADT below 12,000 vehicles, FHWA found that the presence of a marked crosswalk alone, compared with an unmarked crosswalk, made no statistically significant difference in the pedestrian crash rate. However, on multi-lane roads with an ADT of greater than 12,000 vehicles (without a raised median) and 15,000 vehicles (with a raised median) the presence of a marked crosswalk without other improvements was associated with a statistically significant higher rate of pedestrian collisions compared to sites with an unmarked crosswalk. These findings are summarized in Table X.

FHWA stressed that the results of the study should not encourage decision makers to simply remove (or fail to install) marked crosswalks. Rather, the

study suggested adding crosswalk enhancements to the marked crosswalks to balance mobility needs with safety needs. These improvements include providing raised medians on multi-lane roads, installing traffic and pedestrian signals where warranted, adding curb extensions, providing adequate lighting, and designing intersections with tighter turn radii.

In the FHWA study, about 70 percent of the pedestrian crashes occurred at marked crosswalks on multi-lane roads. Of the pedestrian crashes at marked crosswalks, 17.6 percent were classified as multiple-threat collisions. Multiple-threat collisions occur as one car slows down to allow pedestrians to cross, but a second car approaching from behind in the adjacent lane may not see the pedestrian, as illustrated in the image to the right. The slowing vehicle blocks the sight line of both the pedestrian and the second motorist, leading to the pedestrian-vehicle collision. Multi-lane roadways are therefore not well-served by unmarked or marked crosswalks alone. At these sites, the study concluded, engineers should consider countermeasures that provide additional safety to pedestrians and alert motorists to upcoming crosswalks. These countermeasures include advanced yield lines with corresponding signs informing motorists where to yield. Other more substantial measures may also be considered, such as signalization, warning beacons, illumination, or raised medians.



*Multiple threat conflicts on multi-lane roadways occur where a vehicle yielding to a pedestrian inhibits sight lines to another oncoming vehicle.*

Table 1. Recommendations for installing marked crosswalks and other needed pedestrian improvements at uncontrolled locations.\*

Roadway Type (Number of Travel Lanes and Median Type)	Vehicle ADT ≤ 9,000			Vehicle ADT >9000 to 12,000			Vehicle ADT >12,000 - 15,000			Vehicle ADT > 15,000		
	Speed Limit**											
	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h	≤ 30 mi/h	35 mi/h	40 mi/h
2 Lanes	C	C	P	C	C	P	C	C	N	C	P	N
3 Lanes	C	C	P	C	P	P	P	P	N	P	N	N
Multi-Lane (4 or More Lanes) With Raised Median***	C	C	P	C	P	N	P	P	N	N	N	N
Multi-Lane (4 or More Lanes) Without Raised Median	C	P	N	P	P	N	N	N	N	N	N	N

\* These guidelines include intersection and midblock locations with no traffic signals or stop signs on the approach to the crossing. They do not apply to school crossings. A two-way center turn lane is not considered a median. Crosswalks should not be installed at locations that could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices. Adding crosswalks alone **will not** make crossings safer, nor will they necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g., raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions), as needed, to improve the safety of the crossing. **These are general recommendations; good engineering judgment should be used in individual cases for deciding where to install crosswalks.**

\*\* Where the speed limit exceeds 40 mi/h (64.4 km/h) marked crosswalks alone should not be used at unsignalized locations.

**C = Candidate sites for marked crosswalks.** Marked crosswalks must be installed carefully and selectively. Before installing new marked crosswalks, an engineering study is needed to determine whether the location is suitable for a marked crosswalk. For an engineering study, a site review may be sufficient at some locations, while a more in-depth study of pedestrian volume, vehicle speed, sight distance, vehicle mix, etc. may be needed at other sites. It is recommended that a minimum of 20 pedestrian crossings per peak hour (or 15 or more elderly and/or child pedestrians) exist at a location before placing a high priority on the installation of a marked crosswalk alone.

**P = Possible increase in pedestrian crash risk may occur if crosswalks are added without other pedestrian facility enhancements.** These locations should be closely monitored and enhanced with other pedestrian crossing improvements, if necessary, before adding a marked crosswalk.

**N = Marked crosswalks alone are insufficient, since pedestrian crash risk may be increased due to providing marked crosswalks alone. Consider using other treatments, such as traffic-calming treatments, traffic signals with pedestrian signals where warranted, or other substantial crossing improvement to improve crossing safety for pedestrians.**

\*\*\* The raised median or crossing island must be at least 4 ft (1.2 m) wide and 6 ft (1.8 m) long to adequately serve as a refuge area for pedestrians in accordance with MUTCD and American Association of State Highway and Transportation Officials (AASHTO) guidelines.

With these studies as a backdrop, these Guidelines outline a decision making process to identify appropriate treatments for uncontrolled locations and presents a variety of treatment options to mitigate safety, visibility, or operational concerns at specific locations.

## Treatment Selection

At uncontrolled locations, a marked crosswalk with striping alone may not provide adequate visibility to the pedestrian crossing, especially at high volume, high speed, or multi-lane crossings. Enhancements should be considered for installation to supplement crosswalk striping. Appropriate treatments should be identified based on:

- Site characteristics: presence of pedestrian desire lines, available sight distance and visibility, lighting
- Geometric configuration of the roadway: number of vehicle travel lanes and presence of curb extensions or median refuge islands
- Travel data: 85<sup>th</sup> percentile speeds, posted speed limits, and average daily traffic (ADT) volumes.

Marked crosswalks alone should not be installed on multi-lane streets (two or more lanes per direction; three or more lanes total) under the following conditions<sup>14</sup>:

- Speeds of greater than 40 miles per hour

- Average daily traffic volumes (ADT) greater than 12,000 without a raised median or pedestrian refuge island
- Average daily traffic volumes (ADT) greater than 15,000 with a raised median or pedestrian refuge island

Locations with speeds and ADT volumes below these thresholds may also warrant enhancements. The Uncontrolled Treatment Toolbox outlines considerations for the use of enhancements in various contexts as summarized in **Table D-11**. This Toolbox may be used to identify potential treatments at a candidate uncontrolled crosswalk location based on the results of **Figures A-1** and **A-2**.

A calculation of Pedestrian Level of Service forms the basis for the treatment identification. Pedestrian Level of Service is the average delay experienced by pedestrians as they are waiting to cross the street. Expected motorist compliance is another other key variable for treatment identification. Compliance is based on field observations and engineering judgment. It is meant to reflect typical motorist responses to pedestrians attempting to cross the street. If drivers are likely to stop for a pedestrian, the compliance is rated “high.” If drivers rarely stop for pedestrians, compliance is “low.” The compliance rate should be assumed to be low for all locations where the speed limit is greater than 30 MPH. **Table 5** summarizes the appropriate treatments based on level of enhancement needed (with the most significant enhancement required with the worst LOS and compliance rates).

<sup>14</sup> California MUTCD, Section 3B. 18.

**TABLE D-11:  
APPLICATION OF ENHANCED TREATMENTS FOR UNCONTROLLED LOCATIONS**

Pedestrian Level of Service	Expected Motorist Compliance		
	Low (or Speed >30 mph)	Moderate	High
LOS A-D (average delay up to 30 seconds)	<b>LEVEL 3</b> <u>2 lane road</u> : In-pavement flashers, overhead flashing beacons <u>Multi-lane road</u> : RRFB <i>Plus LEVELS 1 and 2</i>	<b>LEVEL 2</b> Curb Extensions, Bus Bulb, Reduced Curb Radii, Staggered Pedestrian Refuge <i>Plus LEVEL 1</i>	<b>LEVEL 1</b> High Visibility Crosswalk Markings, Advanced Yield Lines, Advance Signage
LOS E-F (average delay greater than 30 seconds)	<b>LEVEL 4</b> Pedestrian Hybrid Beacon, RRFB, or Direct Pedestrians to Nearest Safe Crossing <i>Plus LEVELS 1 and 2</i>	<b>LEVEL 3</b> <u>2 lane road</u> : In-pavement flashers, overhead flashing beacons <u>Multi-lane road</u> : RRFB <i>Plus LEVELS 1 and 2</i>	<b>LEVEL 2</b> Curb Extensions, Reduced Curb Radii, Staggered Pedestrian Refuge <i>Plus LEVEL 1</i>

Notes: A pedestrian refuge island (median) is recommended for consideration in all scenarios with more than 2 lanes of traffic.

Level 1 represents a minor intervention, appropriate for situations with lower speeds and traffic volumes and high driver yielding rates. Higher levels represent more significant interventions. Treatments should be combined with higher level treatments added to lower level treatments (i.e., flashing beacons with curb extensions). Additional funding sources should be identified as needed for these enhancements. Failing to provide an enhanced crosswalk when needed and/or removing a marked crosswalk should be an option of last resort.

## Treatment Options

The following tables described preferred pedestrian safety treatments for uncontrolled locations with different roadway characteristics:

- **Table D-12: Geometric Treatments**
- **Table D-13: Striping and Signage**
- **Table D-14: Signal Hardware and Operational Measures**

Within each table, devices are categorized in three levels based on the level of safety concern they are meant to address: Level 1 (all cases), Level 2 (enhancements), and Level 3 (advanced enhancements). Categories of improvements are cumulative; for example, a Level 2 device should also include appropriate Level 1 devices.

**TABLE D-12:  
UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>2-1. Fewer Travel Lanes (“Road Diet”)</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Fewer travel lanes decrease roadway width and crosswalk length, reduce speeds, reduce left-turn and rear-end collisions, and often eliminate the multiple-threat collision. It takes an average pedestrian almost four seconds to cross each additional travel lane. Therefore, reducing the number of travel lanes minimizes the amount of time that pedestrians are in the crosswalk. More travel lanes than necessary can also increase vehicle travel speeds; research has shown that the severity of pedestrian collisions increases with vehicle travel speed. Where fewer travel lanes are not possible, travel lanes can be narrowed to as little as nine feet, especially left- and right-turn pockets.</p>	<p><b>Level 1</b></p>	<p>\$20/LF</p> <p>(Includes removal of existing pavement markings and repainting. Assumes existing curbs remain as is)</p>

**TABLE D-12:  
UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>2-2. Removal of Sight-Distance Obstructions</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>If objects impede sight-distance, this may result in an unsafe condition where motorists and pedestrians are unable to see each other. Items such as parked cars, signage, landscaping, fencing, and street furniture should be placed in a location that will not obstruct sight distance.</p>	<p><b>Level 1</b></p>	<p>\$150/EA  (Item removed is anticipated to be no larger than a sign and post)</p>

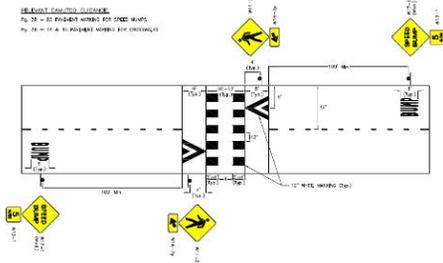
**TABLE D-12:  
UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>2-3. Pedestrian Refuge Island</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Raised islands are placed in the center of the roadway separating opposing lanes of traffic with cutouts or ramps for accessibility along the pedestrian path. Median refuge islands are recommended where right-of-way allows and conditions warrant. Studies show medians are one of the most important safety enhancements available for crosswalks. They simplify complicated multi-lane crossings by breaking the crossings/conflicts into two stages.</p>	<p><b>Level 1</b></p>	<p>\$130/LF  (New curb and new concrete barrier. Assumes 6 foot median)</p>

**TABLE D-12:  
UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>2-4. Curb Extensions</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Curb extensions extend the curb and sidewalks further into the roadway, shortening the length of the crosswalk. They act as a traffic calming device by narrowing the effective width of the roadway and slowing turning speeds. Because they extend into the roadway, often past parallel-parked vehicles, they improve visibility for pedestrians. They also provide space for street furniture, landscaping, bicycle parking, and signs and signal poles. Curb extensions can be constructed with reduced curb radii and to accommodate ADA improvements, such as directional curb ramps.</p>	<p><b>Level 1</b></p>	<p>\$140/LF</p> <p>(Curb, sidewalk, removal of existing curb, new bollards, does not include curb ramps)</p>

**TABLE D-12:  
UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>2-5. Split Pedestrian Crossover (SPXO)</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>This measure is similar to traditional median refuge islands; the difference is that the crosswalks in the roadway are staggered such that a pedestrian crosses half of the street and then walks toward traffic to reach the second half of the crosswalk. This measure must be designed for accessibility by including rails and truncated domes to direct sight-impaired pedestrians along the path of travel.</p>	<p><b>Level 1</b></p> <p>Note: see Table 11 for a Pedestrian Signal</p>	<p>\$130/LF</p> <p>(Same materials as 6-3)</p>
<p><b>2-6. Raised Crosswalk</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Raised crosswalks are speed tables (flat-topped speed humps) outfitted with crosswalk markings and signage, providing pedestrians with a level street crossing. By raising the level of the crossing, vehicles drive more slowly through the crosswalk and pedestrians are more visible to approaching motorists.</p>	<p><b>Level 2</b></p>	<p>\$18,000/EA</p>

**TABLE D-12:  
UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>2-7. Pedestrian Overpass/Underpass</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>This measure consists of a pedestrian or pedestrian/bicycle overpass or underpass of a roadway. It provides complete separation from motor vehicle traffic, normally where no other pedestrian facility is available, and connects off-road trails and paths across major barriers. Overpasses and underpasses should be used as a measure of last resort because of their cost and barriers to their effective/efficient use, with topographical and desire line considerations influencing their design. The cost of an undercrossing compared to an overcrossing can vary depending on multiple factors. On a busy roadway, an undercrossing will likely be more expensive than an overcrossing because of construction staging costs, and undercrossings can vary in cost depending on the presence of underground utilities and groundwater. The cost of either improvement will increase depending on desired aesthetics.</p>	<p><b>Level 3</b></p>	<p>\$300/SF</p>

Source: Fehr & Peers, 2014.

**TABLE D-13:  
UNCONTROLLED CROSSINGS: STRIPING AND SIGNAGE**

Treatment	Description	Level	Estimated Cost
<p><b>3-1. High Visibility Markings</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>All uncontrolled marked crosswalks should feature high-visibility markings. Various striping patterns are available. At trail crossings, such as at the Vine Trail, a triple-four crossing with bicycle stencils in the middle to denote a shared crosswalk for bicyclists and pedestrians should be considered.</p>	<p><b>Level 1</b></p>	<p>\$6/Foot</p>

**TABLE D-13:  
UNCONTROLLED CROSSINGS: STRIPING AND SIGNAGE**

Treatment	Description	Level	Estimated Cost
<p><b>3-2. Advanced Yield Line</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Advanced yield lines, often referred to as “sharks teeth”, should be striped at all marked, uncontrolled crosswalks on multi-lane roadways. They should be placed 20-30 feet in front of the crosswalk. Their intention is to identify where vehicles should stop when yielding to a pedestrian to maintain adequate sight lines. These are typically use on multi-lane roadways but could be considered on two-lane roadways were driver encroachment and yielding are a concern. They should be used with the “Yield Here to Pedestrians” sign.</p>	<p><b>Level 1</b></p>	<p>\$100/EA</p>

**TABLE D-13:  
UNCONTROLLED CROSSINGS: STRIPING AND SIGNAGE**

Treatment	Description	Level	Estimated Cost
<p><b>3-3. Advanced Warning Signs</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>High-visibility yellow or fluorescent-yellow-green (FYG) signs are posted at crossings to increase the visibility of a pedestrian crossing.</p>	<p><b>Level 1</b></p>	<p>\$1,000/EA</p>

**TABLE D-13:  
UNCONTROLLED CROSSINGS: STRIPING AND SIGNAGE**

Treatment	Description	Level	Estimated Cost
<p><b>3-4. In-Street Pedestrian Crossing Sign</b></p>  <p><i>Image Source: FHWA</i></p>	<p>This measure involves posting regulatory pedestrian signage on lane edge lines and/or road centerlines. The in-street pedestrian crossing sign may be used to remind road users of laws regarding right-of-way at an uncontrolled pedestrian crossing. They can be installed on medians and may also be temporary signs, placed by school crossing guards during school hours.</p>	<p><b>Level 1</b></p>	<p>\$400/EA</p>

Source: Fehr & Peers, 2014.

**TABLE D-14:  
UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>4-1. Pedestrian-Scale Lighting</b></p>  <p><i>Image source: www.ci.mil.wi.us</i></p>	<p>Pedestrian-scale lighting improves visibility along a pedestrian’s path and across driveways. It also improves visibility at pedestrian/vehicle conflict points in crosswalks.</p>	<p><b>Level 1</b></p>	<p>\$10,000 per light assuming light every 100 feet</p>

**TABLE D-14:  
UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>4-2. Flashing Beacon</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Flashing amber lights are installed on overhead or post-mounted signs, in advance of the crosswalk or at the crosswalk’s entrance. Full-time flashing beacons are not recommended; flashing beacons are most effective when they are activated by the crosswalk user (they should rest on dark). By resting on dark, they can also be solar powered.</p>	<p><b>Level 2</b></p>	<p>\$20,000/EA</p>

**TABLE D-14:  
UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>4-3. Rectangular Rapid Flashing Beacon (RRFB)</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>The RRFB is an enhancement of the flashing beacon that replaced the traditional slow flashing incandescent lamps with rapid flashing LED lamps. The RRFB may be push-button activated or activated with passive detection. This treatment was approved for use in California via Interim Approval IA-11-83 in 2011. Any installations should be reported to Caltrans for documentation, but do not require pre-approval for experimentation.</p>	<p><b>Level 2</b></p>	<p>\$20,000/EA</p>

**TABLE D-14:  
UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>4-4. Pedestrian Hybrid Beacon (PHB)</b></p>  <p><i>Image Source: FHWA</i></p>	<p>The PHB is a pedestrian-activated beacon that is a combination of a beacon flasher and a traffic control signal. When actuated, the PHB displays a yellow (warning) indication followed by a solid red indication. During the pedestrian clearance interval, the driver sees a flashing red “wig-wag” pattern until the clearance interval has ended and the beacon goes dark. The device is included in the 2012 California MUTCD for use at midblock locations.</p>	<p><b>Level 3</b></p>	<p>\$80,000/EA</p>

**TABLE D-14:  
UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS**

Treatment	Description	Level	Estimated Cost
<p><b>4-5. Pedestrian Signal</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>A pedestrian signal is a conventional traffic control device with warrants for use based on the MUTCD. The pedestrian warrants were revised with the 2009 Federal and 2012 California MUTCD.</p>	<p><b>Level 4</b></p>	<p>\$250,000/EA</p>

Source: Fehr & Peers, 2013.

## Controlled Crosswalk Treatment Toolbox

Controlled crosswalks are located at stop-controlled or signalized intersections. Generally, these crossings do not need enhancements beyond standard crosswalk markings (two parallel lines), as the traffic signal or stop-sign controls allocation of right-of-way. However, in some cases, such as in the Downtown, at skewed intersections, or near schools, the City may consider providing enhanced crossings or signal adjustments to create a sense of place or improved aesthetics, or to improve visibility or safety. This chapter presents preferred and enhanced measures for pedestrian treatments at controlled locations to:

- Improve the visibility of pedestrians to motorists and vice-versa
- Communicate to motorists and pedestrians who has the right-of-way
- Accommodate vulnerable populations such as the disabled, children, and the elderly
- Reduce conflicts between pedestrians and vehicles
- Reduce vehicular speeds at locations with potential pedestrian conflicts

All treatments identified in this chapter are required or allowed by the standards and specifications in the *California Manual on Uniform Traffic Control Devices* (CA MUTCD).

## Universal Considerations

The following treatments are identified as the basic pedestrian crossing improvements to be provided at all stop-controlled and signalized intersections. New controlled intersections should be designed with these treatments included; existing controlled intersections that require retrofits may be prioritized and upgraded as funds become available. These treatments are based on recommended best practices in pedestrian safety:<sup>15</sup>

- Mark crosswalks on all legs of the intersection
- Provide advanced stop bars with each crosswalk
- Minimize the number of vehicle traffic lanes pedestrians must cross
- Provide median refuge islands and thumbnails, as width and path of turn maneuvers allow
- Remove sight-distance obstructions
- Provide directional curb ramps for each crosswalk (e.g., two per corner)
- Eliminate free right-turn slip lanes, where feasible, and mitigate for pedestrian safety (slowing speeds) where they remain
- Locate bus stops on the far-side of the intersection (or in front of mid-block crossings)
- Minimize cycle lengths

<sup>15</sup> See America Walks *Signalized Intersection Enhancements that Benefit Pedestrians* <http://americawalks.org/wp-content/upload/America-Walks-Signalized-Intersection-Enhancement-Report-Updated-8.16.2012.pdf> (2012).

- Reduce prevalence or eliminate permitted signal phasing where pedestrian crossings exist
- Provide pedestrian signal heads for all crossings at signalized intersections
- Provide adequate pedestrian clearance intervals (crossing time) at signalized intersections
- Consider benefits of a roundabout (stop controlled or signalized locations) or signalization (stop controlled locations) for all users

### Signalized Crossing Enhancements

To create a transparent and consistent decision making framework, four issue-specific flow charts follow a multi-step process to determine an enhanced treatment “match” for the signalized intersection characteristics.

**CHART A:**

Actuated Signals Pedestrian Option Flow Chart

Use this flow chart whenever traffic signal actuation is used at the study intersection.

**CHART B:**

Left-Turns on Two-Way Streets Pedestrian Options Flow Chart

Use this flow chart for new and retrofit signal installations, and where a conflict between pedestrians and left turning vehicles is observed/ apparent from collision data.

**CHART C:**

Right Turns on Two-Way Streets or Left Turns on One-Way Streets Pedestrian Options Flow Chart

Use this flow chart for new and retrofit signal installations, and where a conflict between pedestrians and right turning vehicles (or left turning on one-way streets) is observed/ apparent from collision data.

**CHART D:**

Pedestrian Scramble Flow Chart

Use this flow chart to supplement Chart B and Chart C as directed.

Intersection type and pedestrian conflict characteristics form the basis for completing Charts A, B, and C, and the applicable charts are then completed using existing and/or proposed intersection characteristics such as lane configurations, location along transit priority corridor, pedestrian and vehicle volumes, and signal phasing.

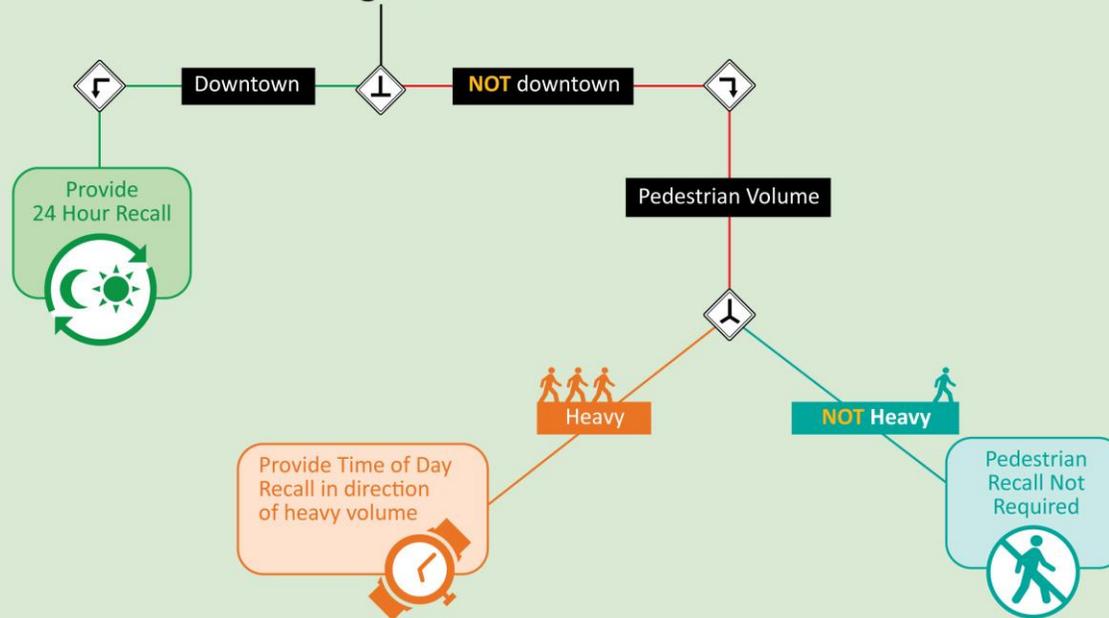
The first step of the left or right turn conflict flow charts is to determine if the pedestrian to vehicle conflict volume levels meet minimum pedestrian scramble considerations, which could lead to completion of the pedestrian scramble test (Chart D) or continuation on the original flow chart (Chart B or Chart C). If the scramble flow chart is completed and passed (*with operations analysis performed*), a pedestrian scramble phase is the recommended treatment. If the scramble flow chart is not completed, the inputs listed above will lead to identification of various pedestrian treatments as resolution to the specified conflicts.

Flow Chart A that is completed for all actuated signals recommends different signal timing pedestrian recall treatments based on the signal’s location, such as a downtown location.

# CHART A: Actuated Signals

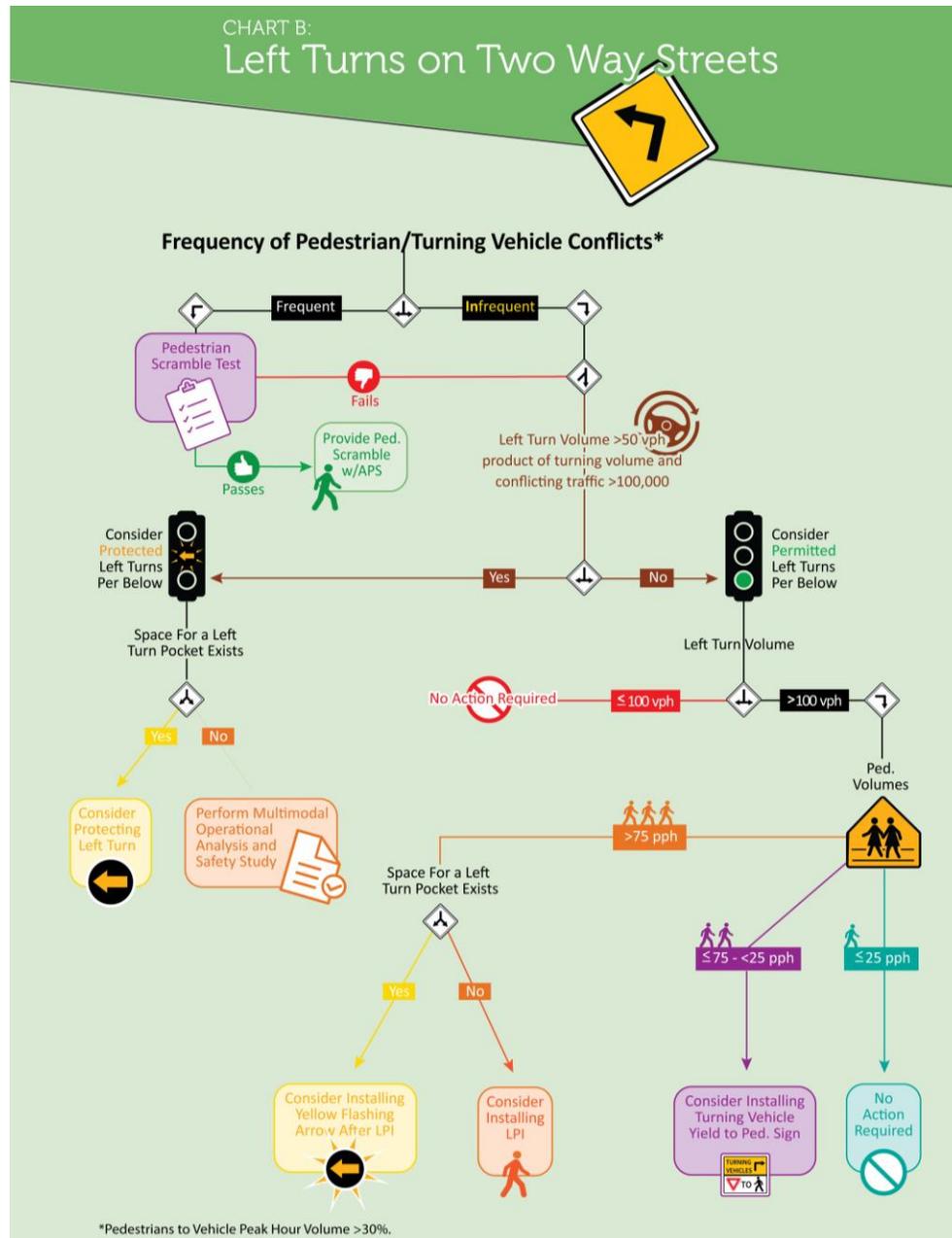


## Actuated Signal Location



\*Threshold for an anchor intersection for one hour on multiple days in a week. For neighborhood continuity, consider recall below the threshold for intersections within the same coordination group as the anchor or within the same land use context/linked destination.

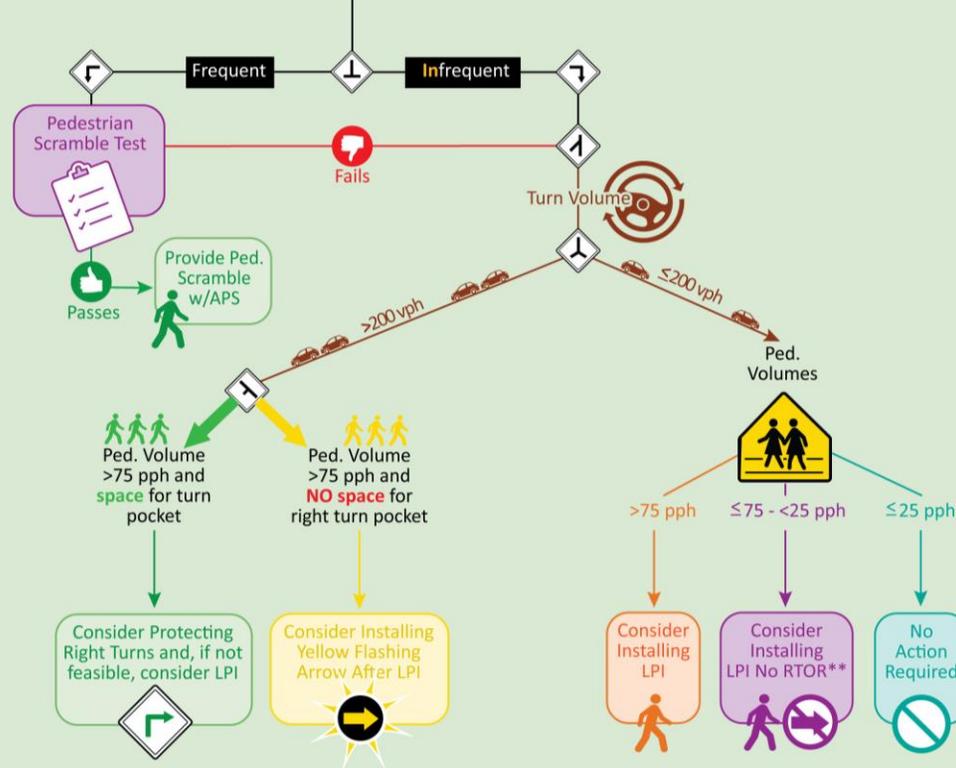
\*\*Provide no more than two recall periods in one day, and ideally only one. Provide a time buffer for the peak period.



# CHART C: Right Turns on Two-Way Streets or Left Turns on One-Way Streets



## Frequency of Pedestrian/Turning Vehicle Conflicts\*



\*Pedestrians to Vehicle Peak Hour Volume >30%

\*\*Turn on Red to be prohibited for movement with high conflicting pedestrian volume.

# CHART D: Pedestrian Scramble



## Should a Pedestrian Scramble Be Installed?

Does the intersection have a history of pedestrian/vehicle collisions and/or is an intersection of two one-way streets?



Yes

Is the intersection located along a major transit corridor?



No

Can the diagonal crossing distance be less than 100 feet?



Yes

Can the cycle length be less than 100 seconds?



Yes

Perform multimodal operations analysis to consider a pedestrian scramble for all pedestrian phases.



No

Yes

No

No



## Flow Chart Footnotes

### 1. Time of Day Recall

- One surveyed city does only 24 hour recall
- Two surveyed cities run pedestrian recall only during the day or peak hours when pedestrian volumes are higher.

### 2. Pedestrian Scramble with Accessible Pedestrian Signals (APS)

- In three cities surveyed, used at intersections with complex geometry or two one-way street intersections with high pedestrian volumes.

### 3. Turn volume for protected left

- CA MUTCD section 4D.19

### 4. Left Turn Volume

- AASHTO section 12.1.1

### 5. Pedestrian Volume

- MUTCD section 4C.05 (pedestrian signalize intersection warrant) and 4F.01 (pedestrian hybrid beacon warrant)

### 6. Right Turn Volume

- CA MUTCD section 4D.07

### 7. Flashing Arrow Leading Pedestrian Interval (LPI) with APS

- Used by one city surveyed to provide a balance between the delay of a protected left and the safety benefits of a protected left. Requires a turn pocket.

### 8. LPI with APS

- Six cities surveyed have implemented LPIs at specific intersections, usually dependent on complaints/requests, collision history, and/or high vehicle turning and pedestrian volumes.

The following tables describe the preferred and optional enhanced pedestrian safety treatments that may be used for controlled locations:

- **Table A-5: Geometric Treatments**
- **Table A-6: Striping and Signage**
- **Table A-7: Signal Hardware and Operational Measures**

**TABLE D-15:  
CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS**

Treatment	Description
<p><b>5-1. Fewer Travel Lanes (“Road Diet”)</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Fewer travel lanes decrease roadway width and crosswalk length, reduce speeds, reduce left-turn and rear-end collisions, and often eliminate the multiple-threat collision. An average pedestrian takes almost four seconds to cross each additional travel lane. Therefore, reducing the number of travel lanes minimizes the amount of time that pedestrians are in the crosswalk. More travel lanes than necessary can also increase vehicle travel speeds; research has shown that the severity of pedestrian collisions increases with vehicle travel speed. Where fewer travel lanes are not possible, travel lanes can be narrowed to as little as nine feet, especially left- and right-turn pockets.</p>

**TABLE D-15:  
CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS**

Treatment	Description
<p><b>5-2. Pedestrian Refuge Island with “Thumbnail”</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Median pedestrian islands provide a refuge for pedestrians to stand if they do not have sufficient time to cross a street. They can be enhanced with median pedestrian push buttons at signalized crossings. Median islands can be installed throughout a corridor or only at specific crosswalks.</p>

**TABLE D-15:  
CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS**

Treatment	Description
<p><b>5-3. Removal of Sight-Distance Obstructions</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>If objects impede sight-distance, an unsafe condition may arise where motorists and pedestrians are unable to see each other. Items such as parked cars, signage, landscaping, fencing, and street furniture should be placed in a location that will not obstruct sight-distance.</p>

TABLE D-15:  
CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS

Treatment	Description
<p><b>5-4. Directional Curb Ramps with Truncated Domes</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Curb ramps offer wheelchair access to/from the sidewalk and crosswalk. Truncated domes, or tactile strips, warn blind pedestrians that they are about to enter a crosswalk. The best practice for curb ramps is to install two per corner so that each ramp points directly into the crosswalk and to the curb ramp at the other side of the street. Corner bulbouts can be used to increase the amount of space available for directional curb ramps.</p>

**TABLE D-15:  
CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS**

Treatment	Description
<p><b>5-5. Right-Turn Lane Design</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Free right-turns allow vehicles to turn right at high speeds. Since the vehicles are not typically controlled by the traffic signal in this circumstance, crosswalks across the turn lanes are usually uncontrolled crosswalks. Controlled right-turn movements are preferable for pedestrians because they require a vehicle to stop on red before turning right. Where “pork-chop” islands that channelize right-turns are necessary to provide acceptable turning radii, raised crosswalks are a pedestrian enhancement. Other options include signaling the crossing (especially if it is multi-lane) and designing the “pork-chop” for slower speeds and better visibility of pedestrians.</p>

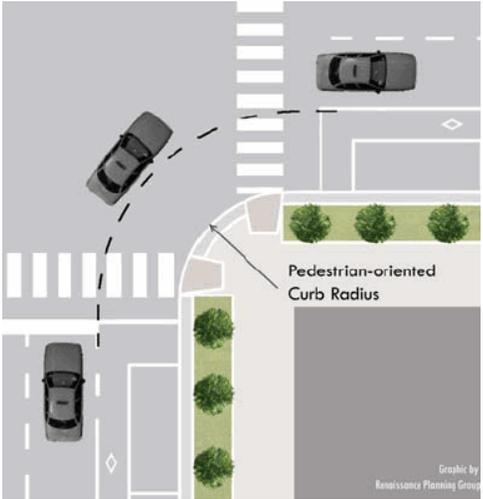
**TABLE D-15:  
CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS**

Treatment	Description
<p><b>5-6. Far-Side Bus Stops</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Far-side bus stops allow pedestrians to cross behind the bus, improving pedestrian visibility. Far side bus stops also enhance transit operations by providing a guaranteed merging opportunity for buses. Exceptions for far-side bus stops include considerations for bus routing, sufficient sidewalk area, and conflicts with parking, land uses, or driveways.</p>

**TABLE D-15:  
CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS**

Treatment	Description
<p><b>5-7. Curb Extensions</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Curb extensions extend the curb and sidewalks farther into the roadway, shortening the length of the crosswalk. They act as a traffic calming device by narrowing the effective width of the roadway and slowing turning speeds. Because they extend into the roadway, often past parallel-parked vehicles, they improve visibility for pedestrians. They also provide space for street furniture, landscaping, bicycle parking, and signs and signal poles. Curb extensions can be constructed to accommodate ADA improvements, such as directional curb ramps.</p>

**TABLE D-15:  
CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS**

Treatment	Description
<p><b>5-8. Reduced Turn Radius</b></p>  <p><i>Image Source: AARP</i></p>	<p>Vehicles travel faster through turns with a large radius. Reducing the radius of a corner is an effective way of reducing vehicle speeds. In suburban environments, turn radii generally do not need to exceed 30 feet. In urban environments turn radii can be 10 feet or less, especially where the meeting of one-way streets prohibits turning movements. Where on-street parking is permitted and/or bicycle lanes are present on one or both streets, consideration for further reductions of radii should occur acknowledging that the effective radius is increased with on-street parking. Corner curb radii on multi-lane streets should acknowledge that trucks turning right can turn into two lanes.</p>

**TABLE D-16:  
CONTROLLED INTERSECTIONS: STRIPING AND SIGNAGE**

Treatment	Description
<p><b>6-1. Marked Crosswalks</b></p>  <p><i>Image Source: Google Maps</i></p>	<p>Marking a crosswalk across all approaches of an intersection improves pedestrian accessibility. At a four-way intersection, a closed crosswalk forces pedestrians to cross via three crosswalks instead of one. Crosswalks on all approaches can often be accommodated without a significant impact to traffic signal operations.</p> <p>At controlled trail crossings, high-visibility triple-four trail crossings with bicycle legends in the middle should be considered to indicate a shared crossing space for bicyclists and pedestrians.</p>

TABLE D-16:  
CONTROLLED INTERSECTIONS: STRIPING AND SIGNAGE

Treatment	Description
<p><b>6-2. Advanced Stop Bar</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Advanced stop bars are placed five to seven feet in front of crosswalks. They keep vehicles from encroaching into the crosswalk when stopped at a red signal or stop sign.</p>

**TABLE D-16:  
CONTROLLED INTERSECTIONS: STRIPING AND SIGNAGE**

Treatment	Description
<p><b>6-3. High Visibility Markings</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>High-visibility crosswalks at controlled locations are appropriate in areas with high pedestrian volumes, at crosswalks with skewed geometries, or near sensitive land uses (such as schools).</p>

**TABLE D-16:  
CONTROLLED INTERSECTIONS: STRIPING AND SIGNAGE**

Treatment	Description
<p><b>6-4. Textured Pavement or Colored Crosswalks</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Textured pavement can be used in crosswalks or in intersections as an aesthetic enhancement. Because of its texture, it may also calm traffic by slowing vehicles before they cross an intersection. It can also make crosswalks more visible. Textured pavement can be made of brick or, alternatively, both concrete and asphalt can be stamped to look like brick or stone. At controlled locations, standard crosswalk striping should be provided in addition to the textured pavement. A smooth, non-slip surface is preferable.</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-1. Adequate Crossing Times</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>The 2012 California MUTCD requires a walking speed of 3.5 feet per second be assumed to determine crossing times as a default minimum (4.0 feet per second was previously the guidance). A speed slower than 3.5 feet per second can be used where slower pedestrians routinely use the crosswalk, such as locations near schools, hospitals, or senior centers.</p>

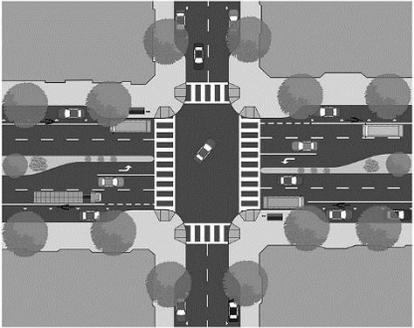
**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-2. Pedestrian Countdown Signal</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Pedestrian countdown signals give pedestrians “Walk” and “Don’t Walk” signals with a second-by-second countdown for each phase. Research suggests that pedestrians are more likely to obey the “Don’t Walk” signal when delivered using a countdown signal. The device has been shown to enhance safety for all road users. The 2012 California MUTCD requires that all new pedestrian signals be countdown signals.</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-3. Pedestrian Signals and Push Buttons</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Mounting push buttons for different crosswalks on one pole can be confusing for blind pedestrians. Push buttons should be separated by ten feet and placed within five feet of each curb ramp, one per crosswalk. At long crosswalks (<math>\geq 60</math> feet) with a median refuge island, push buttons can be placed in the median for pedestrians who may not be able to cross the entire crosswalk in one cycle length. In areas with high pedestrian volumes, eliminating pedestrian push buttons and providing a pedestrian phase in every cycle, can enhance walkability (and signal compliance).</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-4. Short Cycle Lengths</b></p>  <p><i>Image Source: Institute of Transportation Engineers</i></p>	<p>Long cycle lengths at signalized intersections result in long pedestrian wait times to cross a street. By shortening an intersection’s cycle length, pedestrians do not have to wait as long to cross after pushing the button to request a “Walk” signal.</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-5. Protected Left-Turns</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Where permitted left-turns are allowed, denoted by a “Left Turn Yield on Green” sign, left-turning vehicles can conflict with pedestrians in the crosswalk. By making the left-turn protected, so that it is allowed only with a green arrow, the “Walk” signal at a crosswalk occurs at the same time that through- and right-turning vehicles in the same direction receive a green light. This reduces the risk of left-turning vehicle conflicts with the opposing crosswalk; since left-turns typically occur at a higher speed than right-turns, collisions of increased severity can be avoided by protecting left-turns.</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-6. Accessible Pedestrian Signals</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Accessible pedestrian signals (APS) and detectors provide information, such as “Walk” indications and direction of crossing, in non-visual formats to improve accessibility for blind pedestrians. Audible options for accessible pedestrian signals include audible tones and speech messages. Vibrotactile push-buttons are effective options that alleviate the impacts of noise created by audible pedestrian signals. They are also accessible to deaf pedestrians. APS should always be provided when two push buttons are located on one pole and where persons with disabilities are expected frequently at a crossing. At other locations, APS is currently a best practice, but is expected to become a requirement when the proposed rulemaking of the <i>Public Rights of Way Accessibility Guidelines</i> (PROWAG) is finalized.</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-7. Pedestrian Recall</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Pedestrian recall gives pedestrians a “Walk” signal at every cycle. No push-button or detection is necessary since a “Walk” signal will always be given. Pedestrian recalls are useful in areas with high levels of pedestrian activity. They demonstrate that an intersection is meant to serve both vehicles and pedestrians. In general, pedestrian recall should be used if pedestrians actuate a “Walk” signal 75 percent of the time during three or more hours per day. Recall can be used 24-hours a day or during peak hours for pedestrians (in which case push buttons should continue to be provided).</p>
<p><b>7-8. No Right Turn on Red</b></p>  <p><i>Image Source: FHWA</i></p>	<p>When attempting to turn right on red, motorists must look left to see if the road is clear; motorists often do not look right before turning and may not see pedestrians to their right. Restricting right turns on red can reduce conflicts between vehicles and pedestrians. “Blank out” turn restriction signs (see 11-9 below) are more effective than conventional “No Right Turn on Red” signs. “No Right Turn on Red” signs that specify time-of-day restrictions or “When Pedestrians are Present” are confusing to motorists and are often disregarded.</p>

TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES

Treatment	Description
<p><b>7-9. Blank-Out Turn Restriction LED Sign</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>The ubiquity of conventional turn restriction signs, usually for no right turn on red, contributes to their disregard by motorists. Blank out turn restriction signs activate only when the specified movement is prohibited. The LED sign is also very visible.</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-10. Animated Eyes</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>Animated eyes pedestrian signals feature eyes that move from side to side when a “Walk” signal is given. The signals remind pedestrians to look for turning vehicles before proceeding into the crosswalk. Research has indicated that animated eyes pedestrian signals reduce conflicts between vehicles and pedestrians.</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-11. Leading Pedestrian Interval (LPI)</b></p>  <p><i>Image Source: Fehr &amp; Peers</i></p>	<p>A leading pedestrian interval (LPI) advances the “Walk” signal for a few seconds while through-vehicles continue to receive a red indication. By allowing pedestrians to get a head start into the crosswalk, it can reduce conflicts between pedestrians and turning vehicles. The 2012 California MUTCD recommends that LPIs be at least three seconds in duration. Right-turn on red restrictions may be needed with LPIs are installed in locations with lower pedestrian volumes.</p>

**TABLE D-17:  
CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES**

Treatment	Description
<p><b>7-12. Push Button for Extended Crossing Time</b></p>  <p><i>Image Source: FHWA</i></p>	<p>Some pedestrians may need extra time to safely cross a street. Traffic signals can be retrofitted to provide pedestrians with increased crossing time by extending the duration of a pushbutton press.</p>

Source: Fehr & Peers, 2014.

Examples of WRSP Active Transportation Street Features

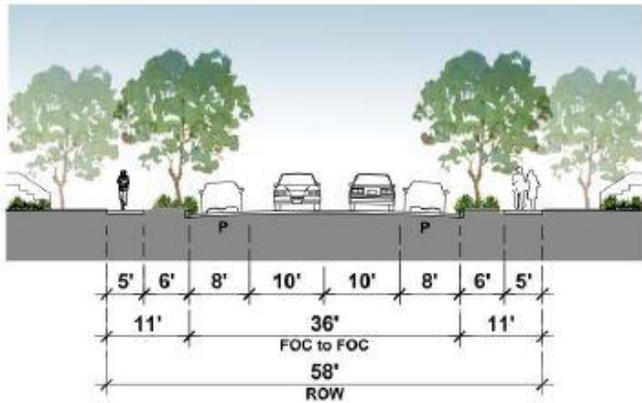
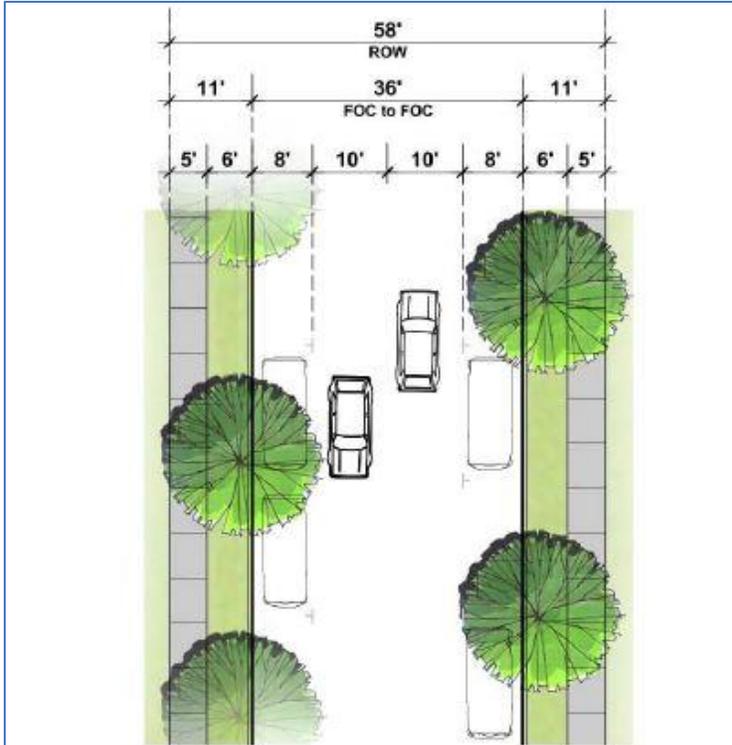


Figure 7.3.5: Modified Local Street (Residential) - A  
Subject to modification

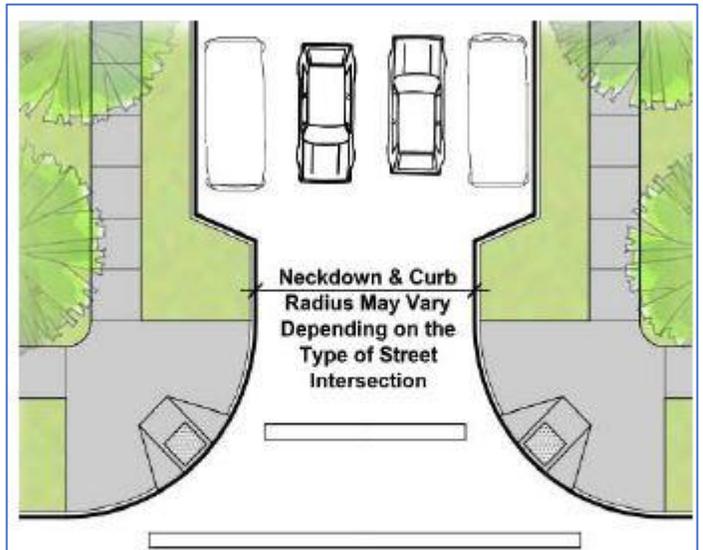


Figure 7.4: Intersection Neckdown/Bulb-out  
Subject to modification

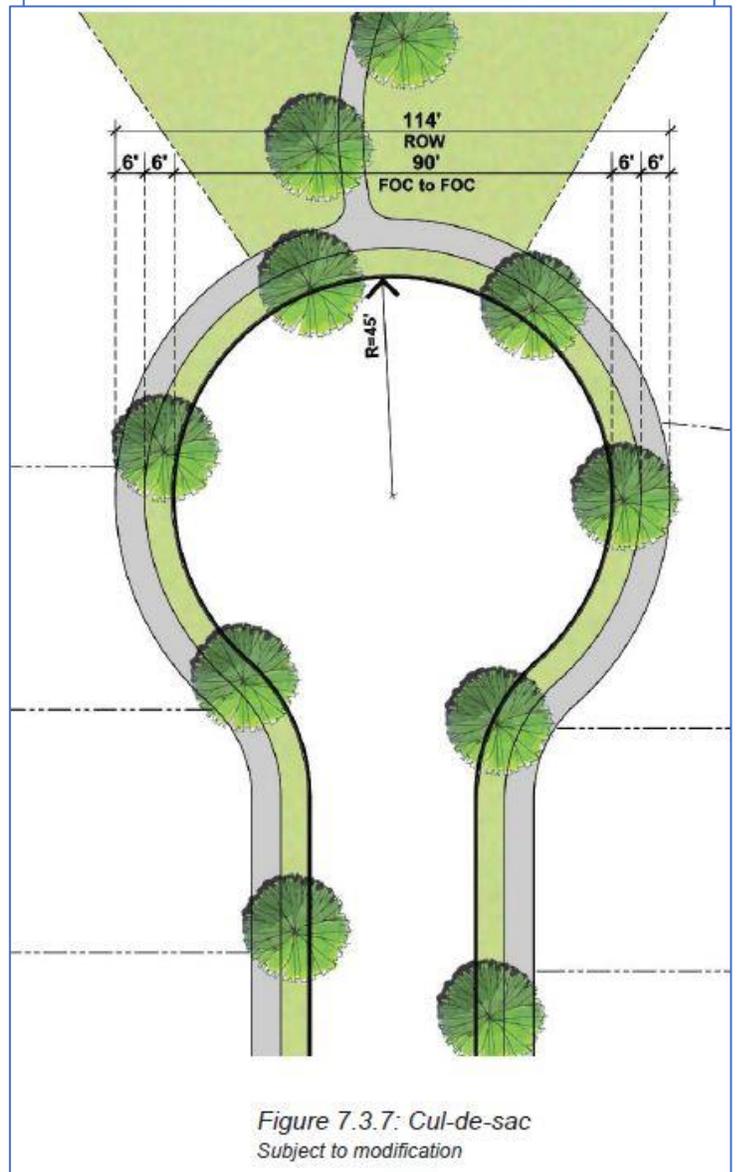


Figure 7.3.7: Cul-de-sac  
Subject to modification

WRSP Pedestrian and Bicycle Circulation Network

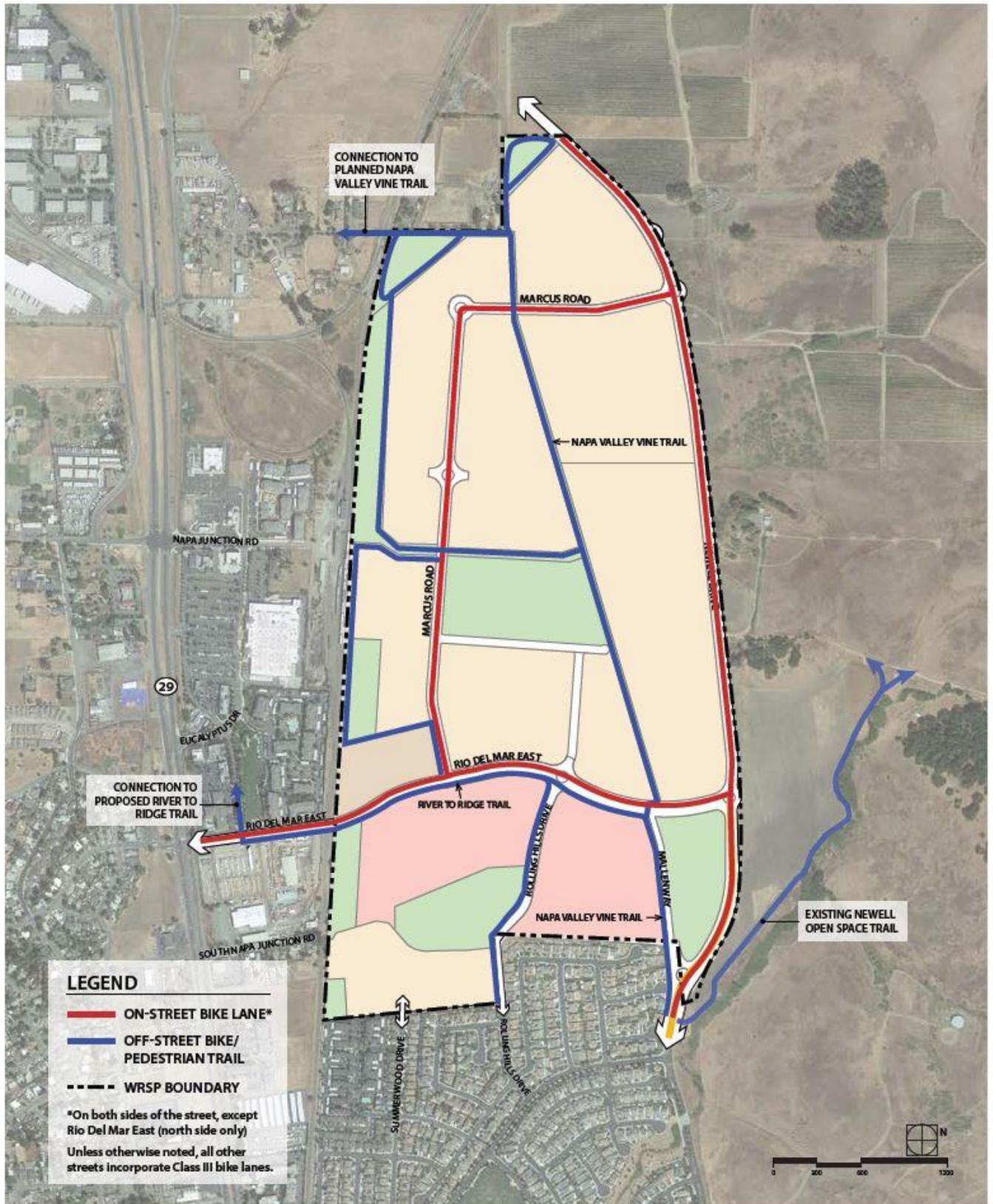


Figure 7.5: Pedestrian and Bicycle Circulation

19.21.050 Bicycle parking requirements.

**(A)** Bicycle parking shall be provided in commercial and employment areas according to Table [19.21.050](#).

**Table [19.21.050](#)  
REQUIRED BICYCLE PARKING**

Total Automobile Parking Spaces	Minimum Number of Bicycle Spaces
1-4	0
5-14	1
14-29	2
30-44	3
45-59	4
60-74	5
75-99	6
100-199	7
200-299	8
300-399	9
400 and greater	10

**(B)** Bicycle parking should be located in highly visible locations and should be lockable.

**(C)** The bicycle parking requirement may be phased for parking areas containing sixty or greater spaces depending on accessibility of the area to bicycle routes.

(Ord. 2004-10 Exh. 3, 2004.)