Napa Countywide Pedestrian Plan

NAPA VALLEY TRANSPORTATION AUTHORITY

FEHR & PEERS

August 2016

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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, *Countywide Walking Trends*
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, *Countywide Walking Trends*
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*, *Pedestrian Setting*
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*, *Priority Projects and Implementation Plan* Chapter 8, *Support Programs*
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*, *Priority Projects and Implementation Plan*
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*, *Pedestrian Setting*
A description of the extent of community involvement in development of the plan, including disadvantaged and underserved communities	Chapters 2-7*, *Public and Stakeholder Input*
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, *Plan Consistency*
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*, *Priority Projects and Implementation Plan*
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*, *Next Steps*
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, *Performance Goals*
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*, *Appendix E*

*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

LAKE COUNTY
YOLO COUNTY
29
128
Calistoga
Saint Helena
NAPA COUNTY
128
128
29
Yountville
SONOMA COUNTY
121
Napa
29
SOLANO COUNTY
12
American Canyon
MARIN COUNTY
County Boundary
Napa County
0
2
4
Miles

Exhibit 1

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)[1]
Auto	306,598 (88%)
Pedestrian	62,091 (9%)
Bicycle	1,234 (1%)
Transit	2,575 (1%)
Other[2]	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[1]		163,609[2]	
Mode	**Daily Trips[3]**	**Mode Share**	**Daily Trips**	**Mode Share[4]**
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[1]	Pedestrian Fatalities	Proportion of All County Fatalities[1]	Total Pedestrian Collisions	Proportion of All County Collisions[2]
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

1 "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.

2. 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 [1]. 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.

[1] 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

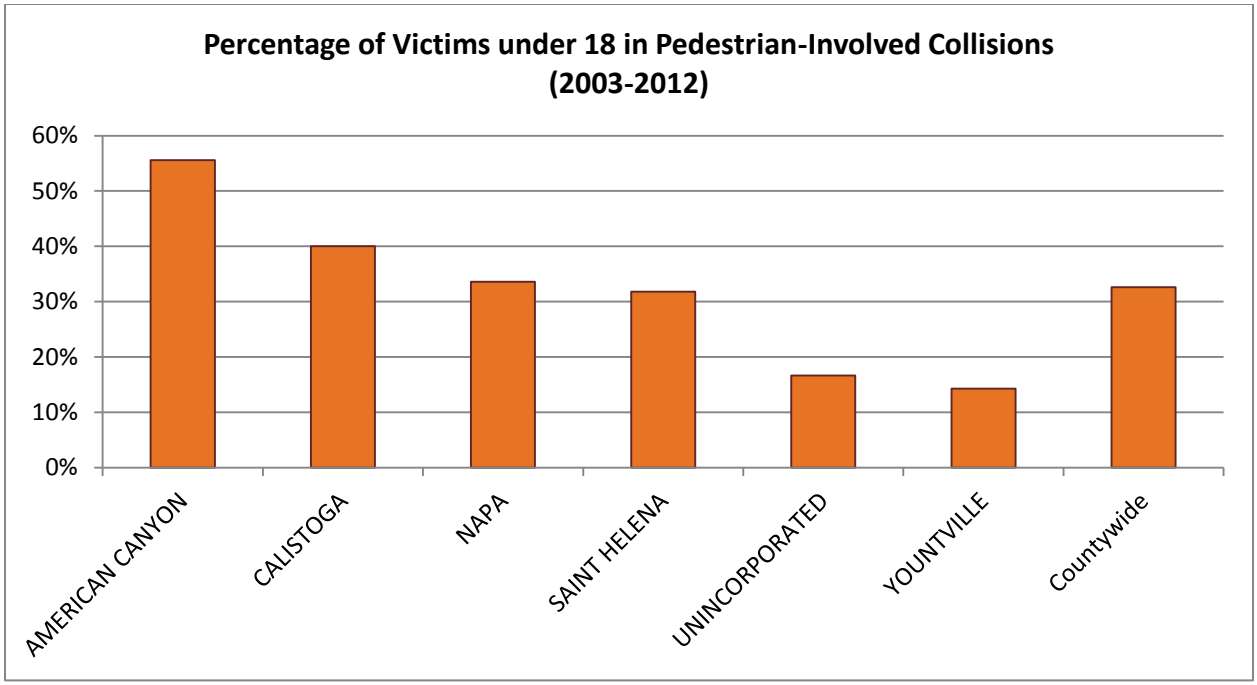


Figure 1 Countywide Child-Involved Pedestrian Collisions

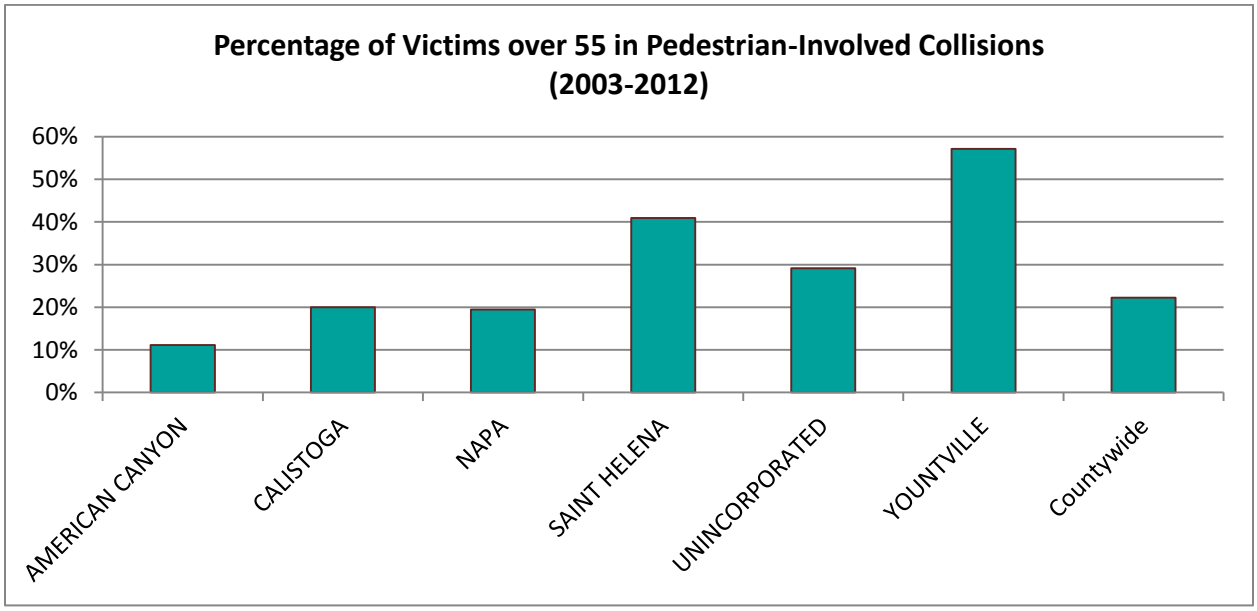


Figure 2 Countywide Senior-Involved Pedestrian Collisions

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.

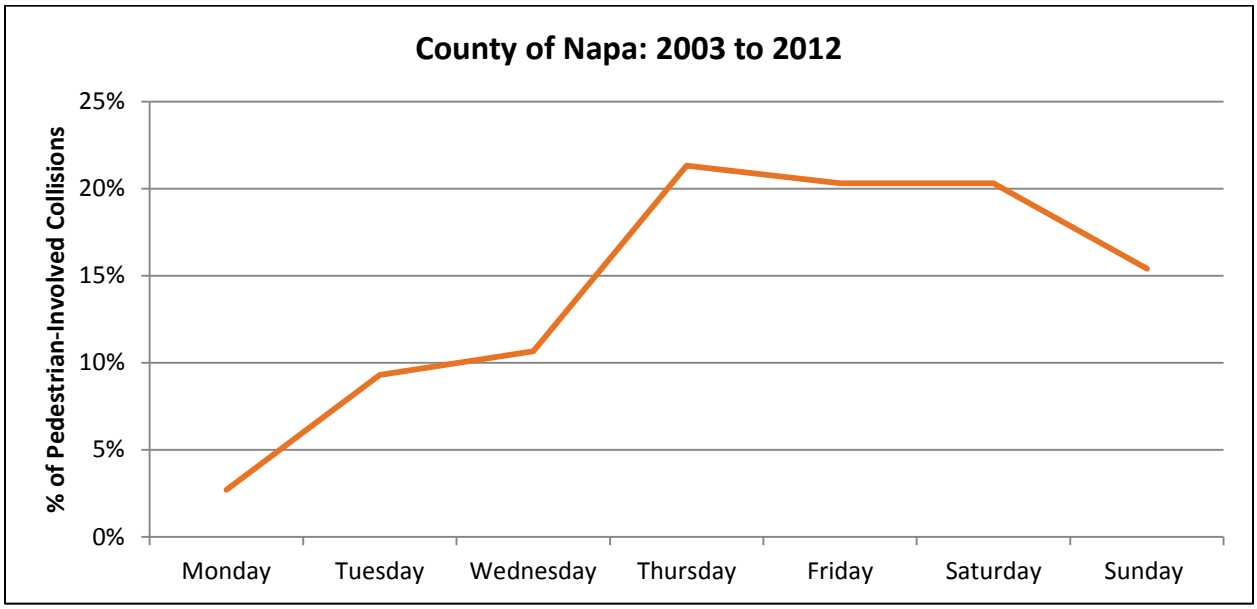


Figure 3 Daily Trends for Pedestrian-Involved Collisions

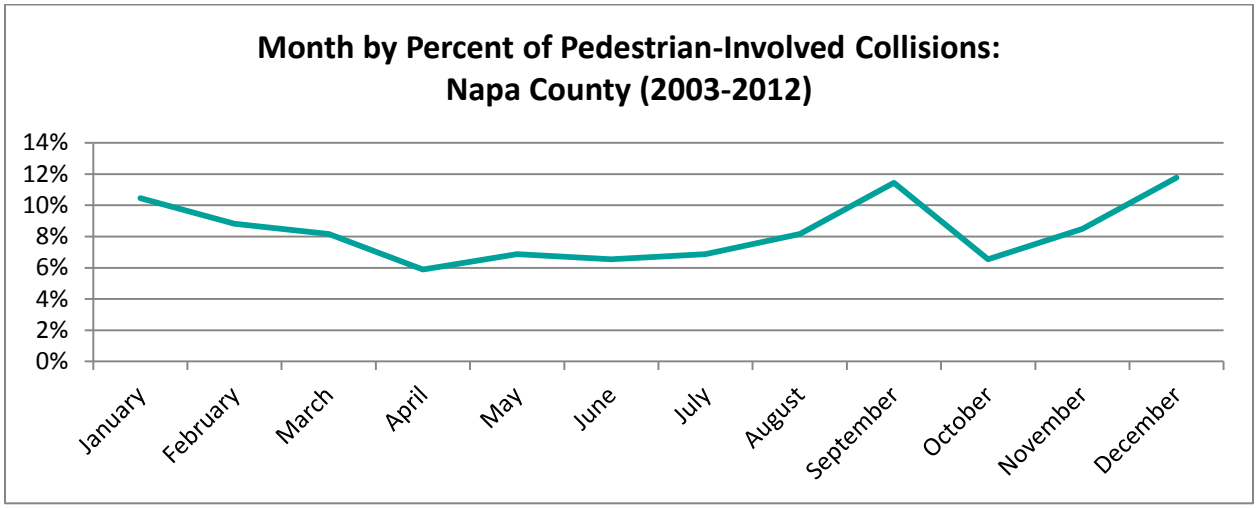


Figure 4 Seasonal Trends for Pedestrian-Involved Collisions

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[1]	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

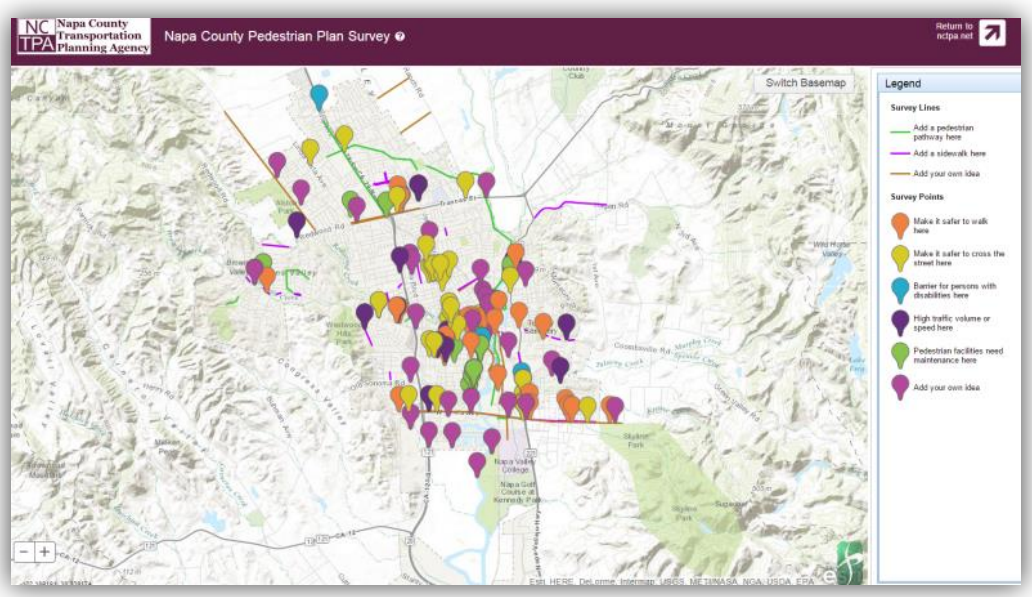
improving access and safety at key desire lines, or the shortest or most easily navigated path of travel between an origin and destination. Education and enforcement regarding pedestrian right-of-way may also be indicated.

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.

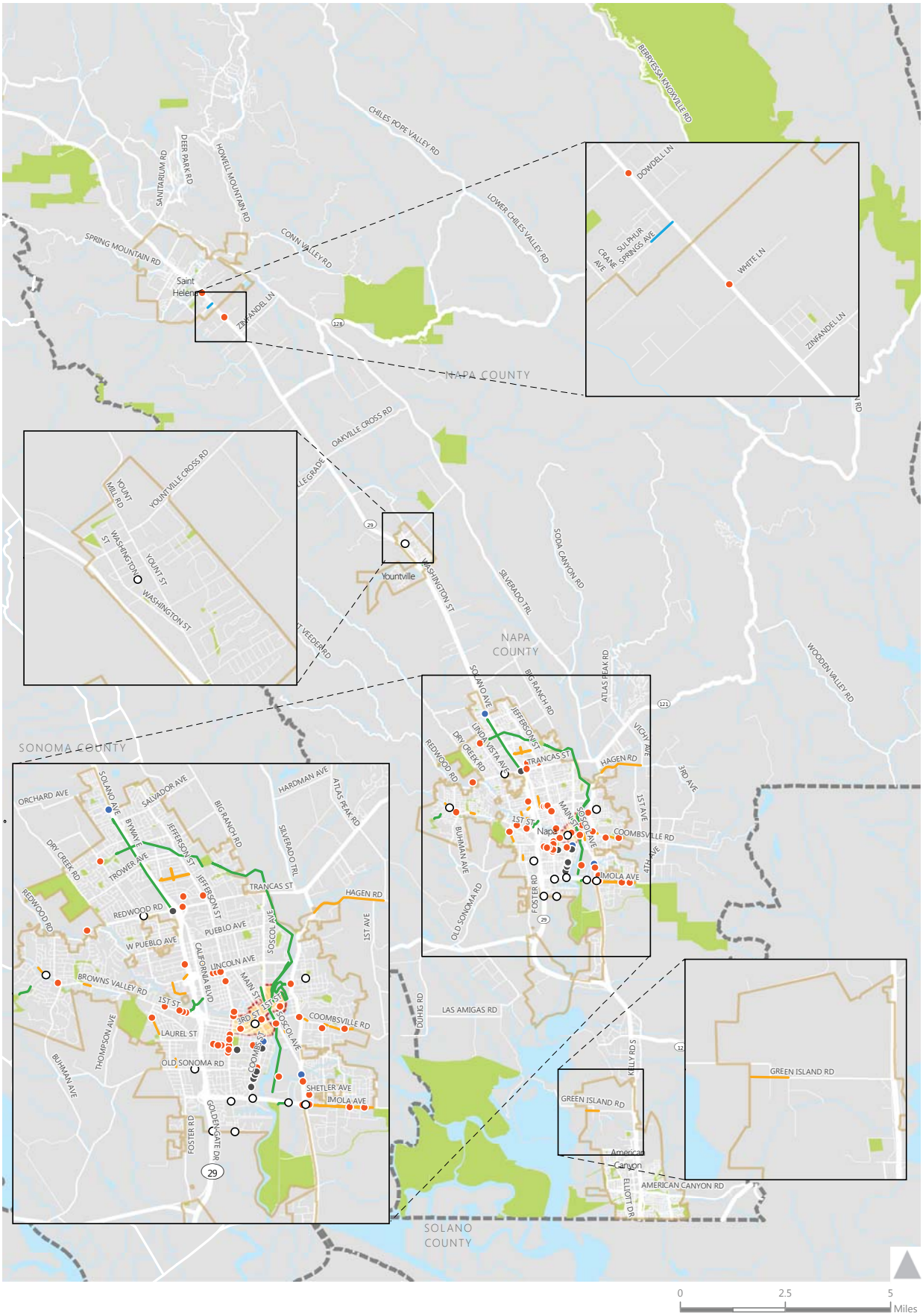


Exhibit 2
Countywide Online Mapping Comments

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 2

Calistoga Plan

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Chapter 2
Calistoga Plan

Calistoga is a rural small-town community with approximately 5,155 residents which, according to city staff, can double or triple on any weekend when accounting for visitors in town for the many local and regional tourism options. The city is located in northern Napa County, approximately 30 miles north of the City of Napa along SR 29. Projected land use patterns for the city are shown in Exhibit C-1 and a map of the downtown commercial district, including the locations of public buildings and tourist destinations, is shown in Exhibit C-2.

Existing Pedestrian Policies and Programs

To help guide the development of key programs and policies for this plan, Calistoga'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)

The City of Calistoga has made significant investments in creating a walkable community through the adoption of several pedestrian-oriented ordinances, collaboration with Safe Routes to School education programs as well as the recent collection of collision data and a pedestrian facility inventory. The city also adopted an Active Transportation Plan in 2014 which prioritizes facility improvements and includes pedestrian policies and programs. With this plan, the City of Calistoga will have a framework to strengthen areas of opportunity such as crosswalk design guidelines, pedestrian volumes and traffic calming programs. A summary of these benchmarking highlights is provided in **Table C-1**. The full benchmarking analysis for Calistoga, with associated recommendations, is presented in **Appendix C-A**.

TABLE C-1: CALISTOGA BENCHMARKING HIGHLIGHTS

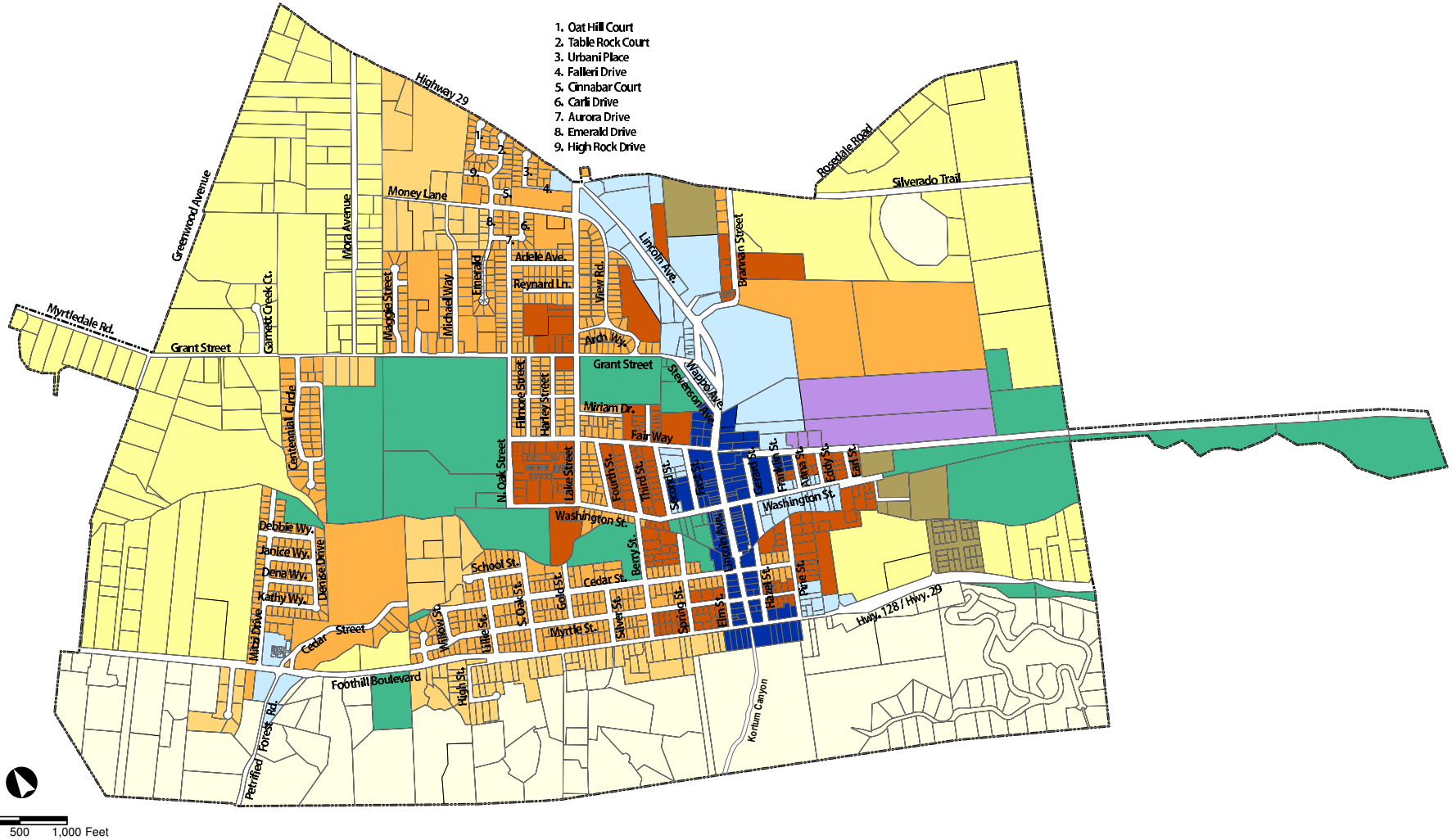
Plans, Policies, & Programs	Calistoga Current Practice	Best Practice Examples
Key Strengths		
Newspaper Rack Ordinance Newspaper racks may obstruct walkways and reduce accessibility and pedestrian visibility when ordinances are not in place. A Newspaper Rack Ordinance improves the pedestrian realm by reducing clutter and organizing sidewalk zones and may detail size, location, and maintenance requirements.	Calistoga has a robust newspaper rack ordinance that addresses pedestrian safety and prohibits disruption of pedestrian flow. The policy also restricts the placement of newspaper racks anywhere that may obstruct a driver's line of sight.	
Street Tree Ordinance 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 utilities.	Calistoga's tree ordinance includes requirements for maintaining vertical pedestrian clearances and installing root barriers to avoid sidewalk damage. Calistoga has adopted the City of Santa Rosa's approved street tree list. In lieu of funding for sidewalk replacement and substantial repair, the city also grinds areas of the sidewalk to remove trip hazards as part of their trip and fall assessments, including locations that are lifted by tree roots.	

TABLE C-1: CALISTOGA BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Calistoga Current Practice**	**Best Practice Examples**
Safe Routes to Schools 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, as much as 30% of morning peak hour traffic. Educational components of SRTS programs are especially important for school children where safe walking habits may be instilled as lifelong lessons. Funding for programs and/or projects is available at the state and federal levels.	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 Calistoga Elementary School and Calistoga Jr/Sr High School in 2016. 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. In Calistoga, Safe Routes to School routes have been mapped in the ATP to identify potential locations for infrastructure improvements, and the city is currently working on applications for SRTS infrastructure funding. The city also includes schools in the development review process.	• Reference the public involvement, analysis, and prioritization efforts of the countywide ATP and the Calistoga PSA when applying for grants to fund the top projects. • Determine feasibility of rolling out Walking School Bus program for Calistoga Elementary School. • Coordinate with NVTA to seek additional funding for SRTS infrastructure and non-infrastructure projects and programs.
Collision Reporting 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).	Collision data from the beginning of 2002 through the end of 2011 was mapped as part of Calistoga's Active Transportation Plan (ATP) and reviewed for trends related to pedestrian safety. The ATP also includes a policy to reduce pedestrian and bicycle collisions by 50 percent by the year 2020, based on 2011 collision data, as well as to review collision data annually to identify and prioritize applicable projects and programs.	• 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. • 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 funding. Volunteers can collect pedestrian volumes and other data at collision locations.

TABLE C-1: CALISTOGA BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Calistoga Current Practice**	**Best Practice Examples**
Inventory of Pedestrian Facilities A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc.	Calistoga has a Citywide inventory of existing and proposed sidewalks, existing and proposed pathways, and ADA-compliant curb ramps collected as part of the 2014 Active Transportation Plan (ATP) that is geo-referenced in GIS. The city offers design guidance to developers building fronting sidewalks as well as a 50/50 cost sharing program for those repurposing an existing use. For new developments, pedestrian connectivity is required and if needed, the developer is responsible for the full cost of sidewalk construction. Property owners are generally responsible for the maintenance of fronting sidewalks; however the city uses 50/50 cost sharing for maintenance and repair efforts at their discretion, especially for sidewalks downtown along Lincoln Avenue.	• This plan has created a GIS-based inventory to expand the city's existing inventory. Data collected includes crosswalks, existing and missing curb ramps, as well as additional features like sidewalk material and curb ramp direction. This facility inventory could be expanded to include proposed or planned pedestrian crossing improvements in the City. • Consider mapping public comments to ensure all necessary sidewalk repairs and other pedestrian improvements are included in the city's Capital Improvement Program (CIP).
Key Opportunities		
Crosswalk Design Guidelines A formal policy for crosswalk installation, removal, and enhancement provides transparency in decision-making and creates a consistent application of treatments citywide.	The City of Calistoga has a pedestrian crossing policy in their Active Transportation Plan (ATP) to provide safety features at uncontrolled pedestrian crossings, especially within pedestrian districts and at intersections of arterials with Class I trails[2]. The policy does not include criteria for appropriate enhancements. The City of Calistoga generally considers crosswalks at signals and high volume activity centers, especially near schools. The one existing signal is on Lincoln Avenue, a highway facility, and thus decisions regarding signalized crosswalk installation are made by Caltrans. Several uncontrolled crosswalks are installed on Lincoln Avenue at intersections with minor streets. The city does not install uncontrolled midblock crossings under current practice.	• Consider adopting crosswalk guidelines as part of this plan that reflect best practices and recent research to include criteria for appropriate locations to install crosswalk enhancements such as flashing beacons, advanced yield markings, or in-roadway pedestrian signs. • Coordinate with Caltrans to include criteria in the crosswalk guidelines for identifying, installing, and enhancing crossings where strong desire lines exist, especially across Lincoln Avenue. • Using the proposed crosswalk guidelines, conduct audits of the adequacy of current crosswalks.

[2] City of Calistoga Active Transportation Plan, 2014

TABLE C-1: CALISTOGA BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Calistoga Current Practice**	**Best Practice Examples**
Pedestrian Volumes Pedestrian volume data is important for prioritizing projects, developing collision rates, and determining appropriate pedestrian infrastructure.	The City of Calistoga does not collect pedestrian volumes routinely.	• Use collected volumes in this plan to monitor volume levels. • Consider installing automated counters such as Eco-counter at key locations. • 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.
Traffic Calming Programs 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.	The City of Calistoga does not have a Traffic Calming Program; however, radar speed detection signs are in use near the high school and were funded through an insurance pool for safety improvements. The city municipal code prohibits the use of speed humps in Calistoga.	• Consider adopting a Traffic Calming program for pedestrian concerns that arise from residents in Calistoga and to address current concerns from the Police Department such as speeding and cut-through traffic near the elementary and high schools.



Source: City of Calistoga, 2015 Land Use

Exhibit C-1

Calistoga - Land Use Map

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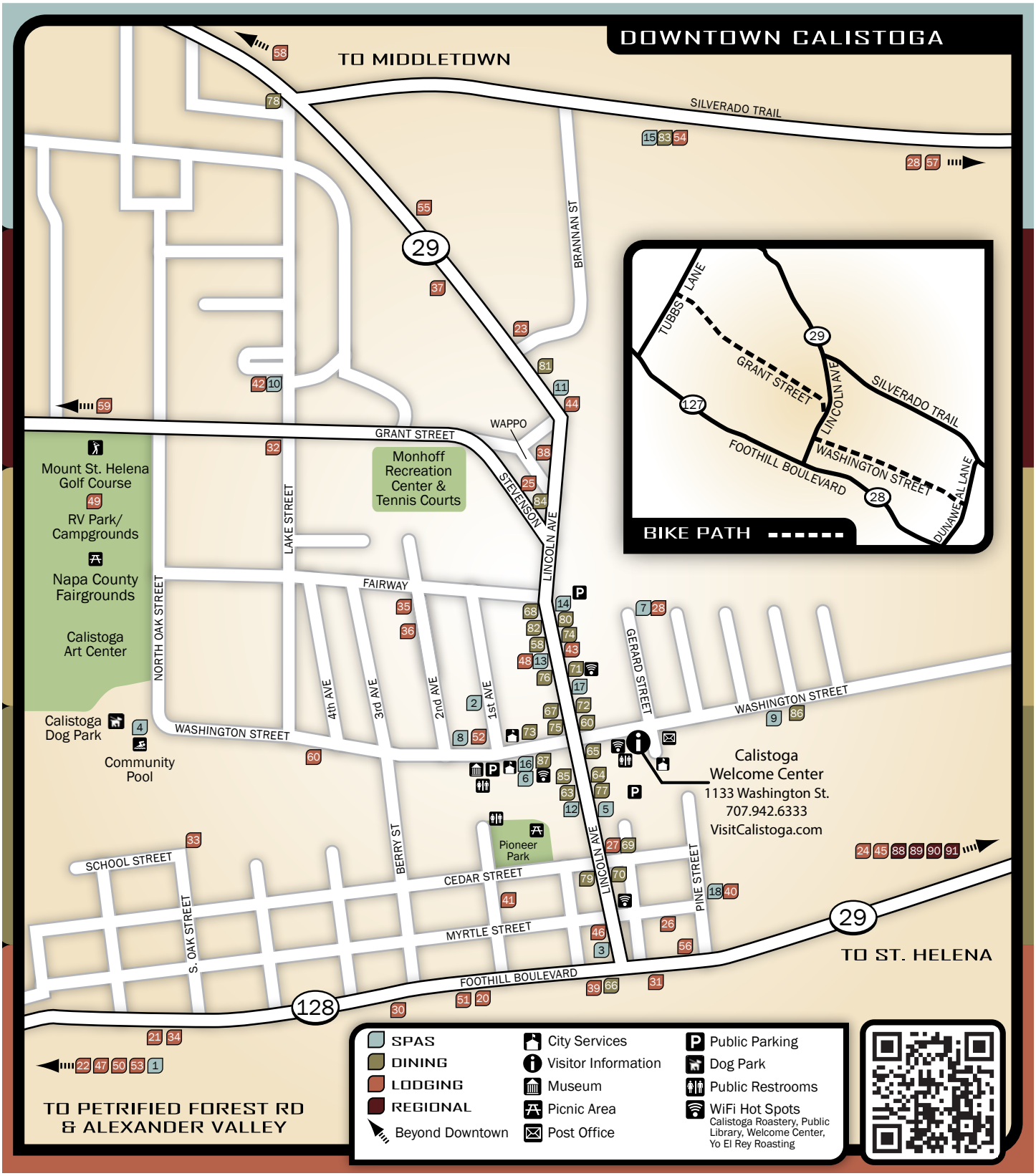


Exhibit C-2

Downtown Calistoga - Destination Map

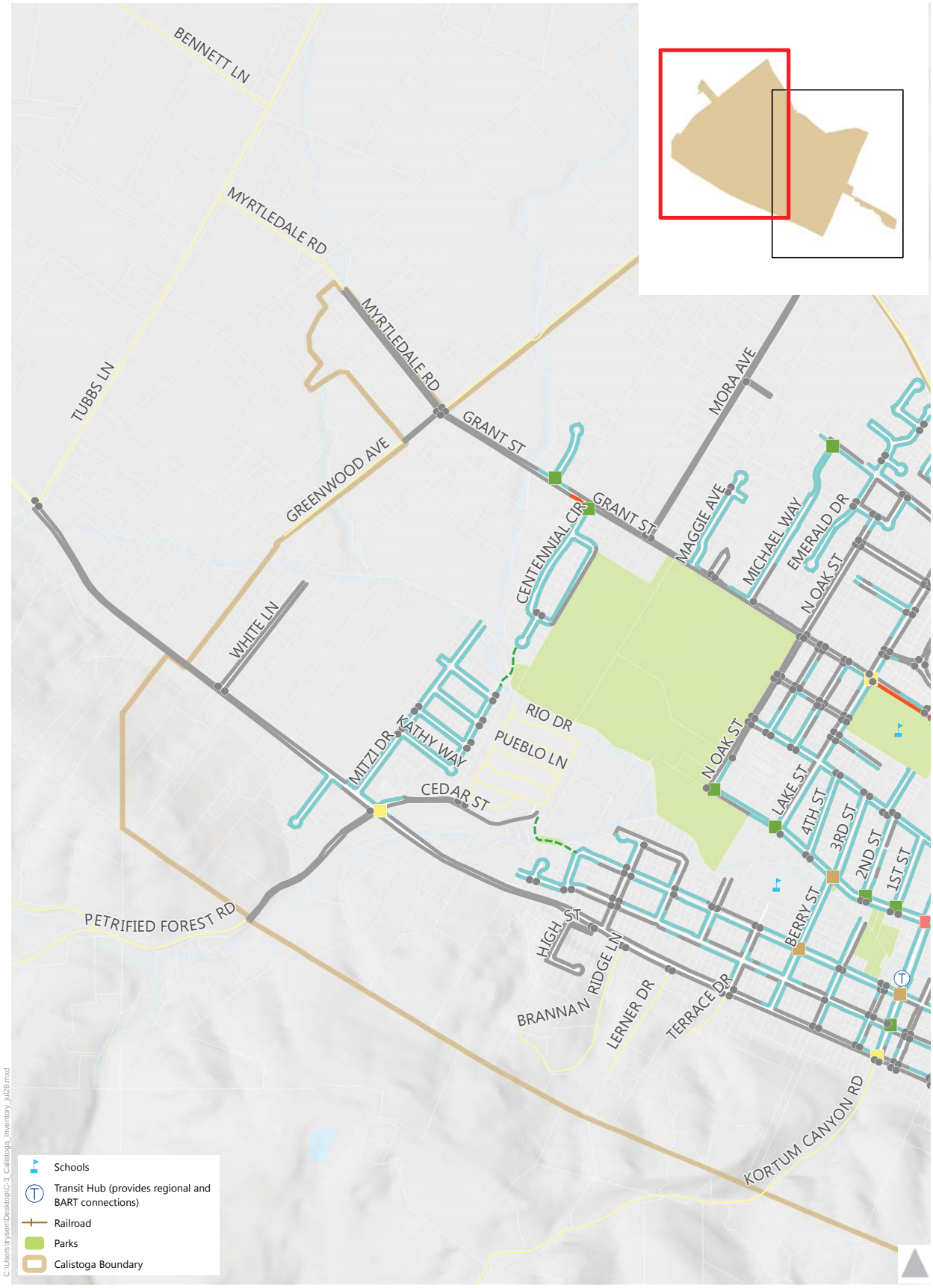
Existing Pedestrian Infrastructure

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.

Calistoga Inventory

Inventory was collected on the entire roadway network in Calistoga, and supplements existing data from the city's 2014 *Active Transportation Plan* (ATP). As shown in Exhibit C-3, the city has several sidewalk gaps along Grant Street, which connects Calistoga Junior-Senior High School to the surrounding neighborhoods, as well as along Cedar Street, which was identified by staff as an east-west pedestrian corridor. Washington Street was also identified as a primary east-west pedestrian corridor and *Exhibit C-3* shows the potential for several additional curb ramps along the roadway. The primary north-south pedestrian corridor in Calistoga is Lincoln Avenue, which runs through the center of the downtown. The city's *General Plan Circulation Element* highlights the need to install marked crossings at pedestrian nodes on Lincoln Avenue and *Exhibit C-3* shows several intersections that were identified by city staff, including Lincoln at Brannan Street and at Stevenson Street, that are lacking marked crosswalks at important desire lines. The majority of missing sidewalks in Calistoga are presented as "proposed sidewalks" in the city's *ATP* and missing curb ramps are shown as "planned."



Pedestrian Inventory

0 0.25 0.5 Mile

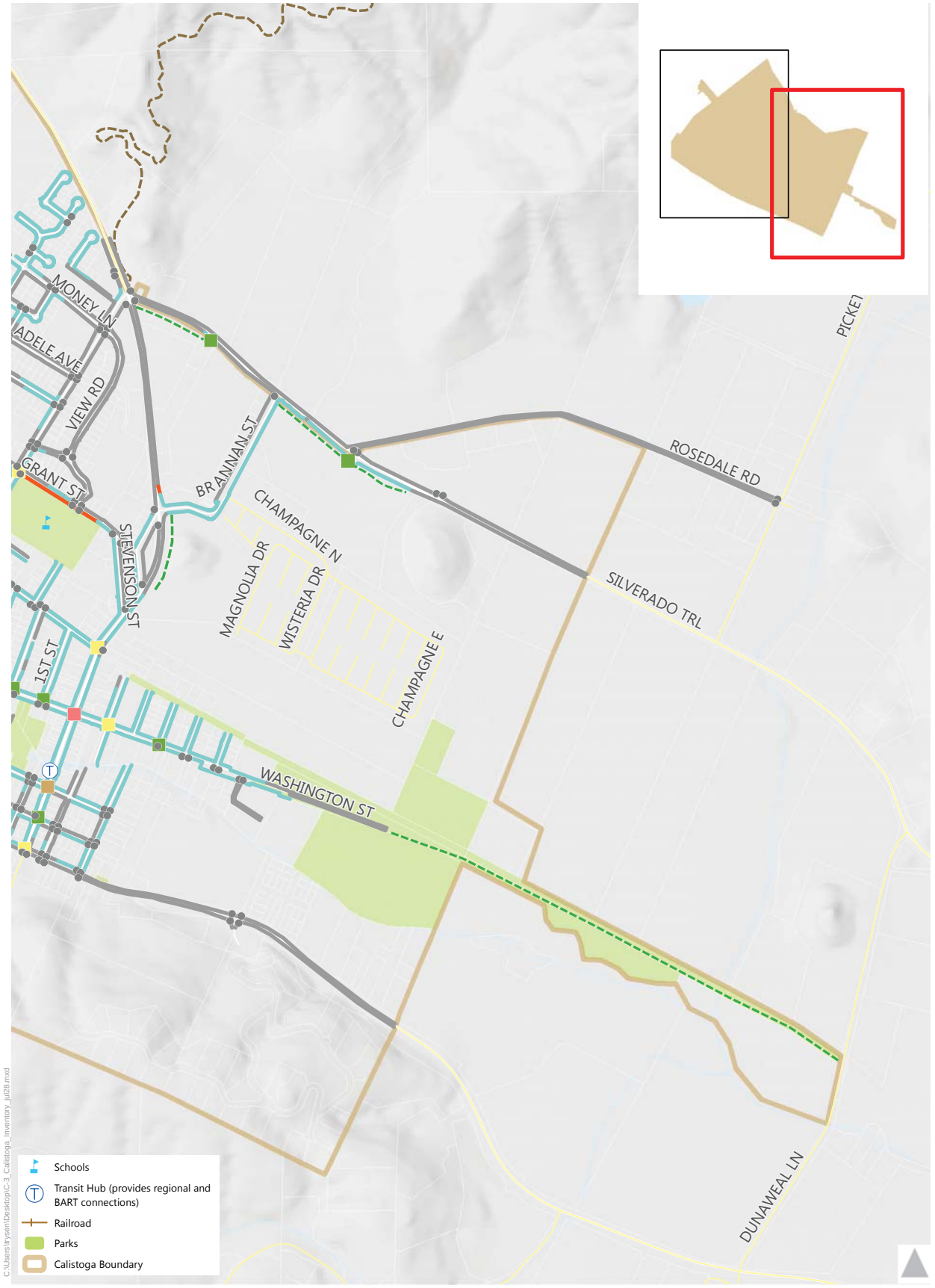
Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5

- Missing Curb Ramp
- Roads not Surveyed

Exhibit C-3a
Pedestrian Facility Inventory
City of Calistoga



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5

- Missing Curb Ramp
- Roads not Surveyed

Exhibit C-3b
Pedestrian Facility Inventory
City of Calistoga

Activity Levels

Pedestrian counts were conducted at eight locations throughout Calistoga 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 levels of walking, and proximity to key pedestrian destinations, including schools and downtown commercial areas. **Table C-2** provides a summary of the two-hour counts completed within the city. Count results varied significantly based on nearby neighborhood population density, as well as by the adjacent land use.

TABLE C-2: CALISTOGA COUNT PROGRAM LOCATIONS

ID	Jurisdiction	Location	Morning	Evening	School	Weekend
			7-9AM	4-6PM	2-4PM	12-2PM
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	

Three of these counts were conducted in close proximity to local schools; CA5 and CA8 were collected at intersections adjacent to Calistoga Junior-Senior High School and CA4 was collected near Calistoga Elementary School. Pedestrian volumes near the elementary school were observed to be about two and half times as high in the morning as near the high school, and just over twice the amount during the school dismissal period (2-4PM). The highest number of pedestrians was observed during the evening weekday period at SR 29 and Cedar Street, a key southern connection to downtown. The lowest number of pedestrians was observed during the weekday morning period near the southwest edge of town at Petrified Forest Road and Foothill Boulevard.

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 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.

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).

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 C-4 shows the locations of these pedestrian collisions in Calistoga.

Exhibit C-4 presents raw collision counts only. While this is illustrative of "hot spot" areas, 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

The majority of reported collisions in Calistoga occurred along Lincoln Avenue, the main commercial corridor that runs through the city's downtown, as shown in Exhibit C-4. Of particular interest is the Washington Street and Lincoln Avenue intersection, where three injury collisions were reported. No fatalities were reported in Calistoga over the last ten years.

Countywide Demographic and Seasonal Trends

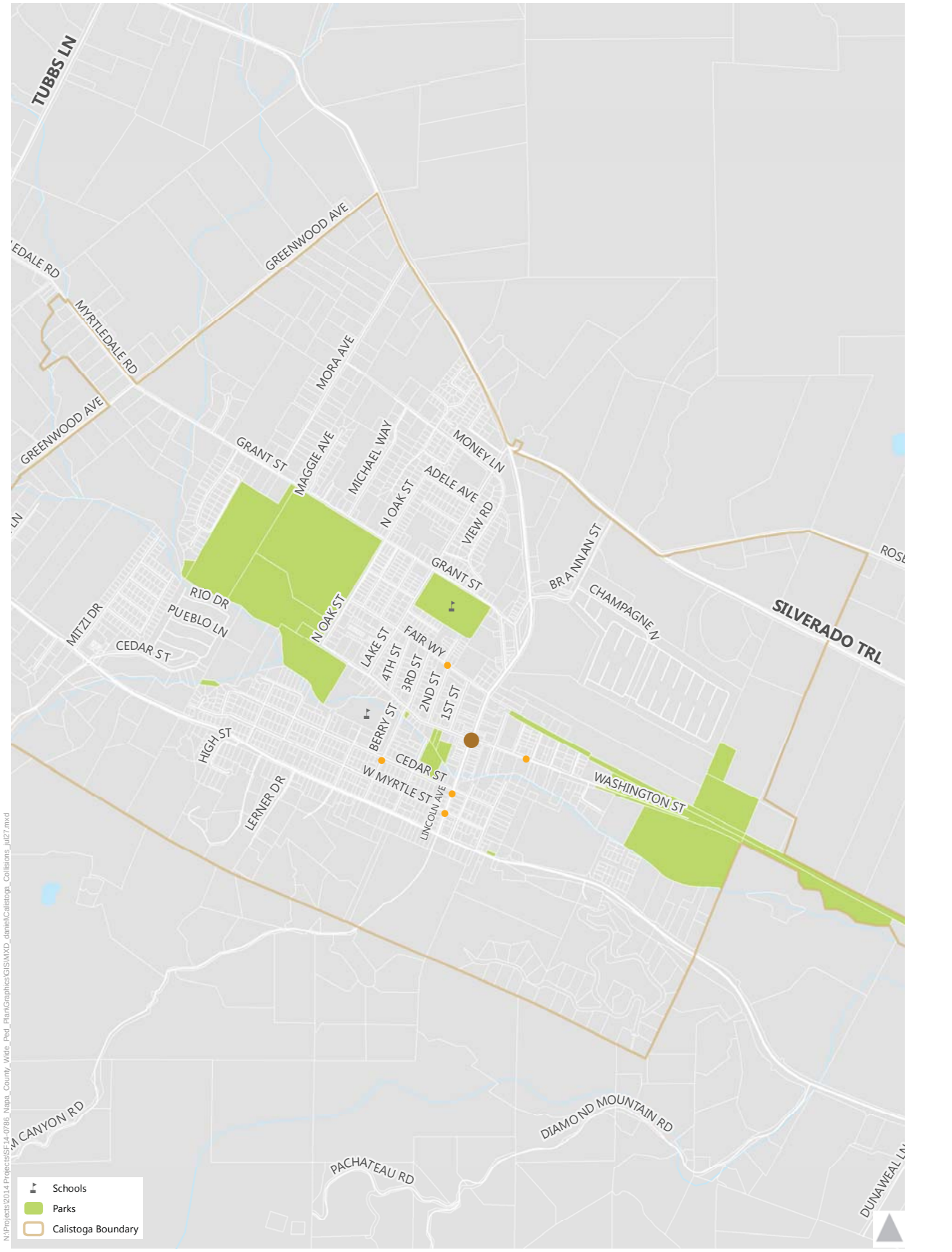
For this plan, a review of collisions countywide included organizing the data by age for children and seniors, and comparing the results across each jurisdiction. Daily and seasonal trends for collision occurrences and primary collision factors were also reviewed countywide. A summary of these results 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. The pedestrian actions in **Table C-3** show that safety issues surrounding collisions in Calistoga are typically focused on pedestrian crossing locations.

TABLE C-3: CALISTOGA COLLISION SUMMARY PEDESTRIAN ACTIONS (2003-2012)			
Primary Collision Factor	Number of Collisions		
	Injury	Fatality	Total
Crossing in Crosswalk at Intersection	6	0	6
Crossing Not in Crosswalk	2	0	2

Source: SWITRS



Pedestrian-Involved Collisions 2003-2012

- 1
- 2 - 3

Injury Collisions

Pedestrian Collision Locations

Density	Intersection	Total Collisions
●	Cedar St. and Berry St.	1
●	Lincoln Ave. and Myrtle St.	1
●	Lincoln Ave. and Cedar St.	1
●	Washington St. and Anna St.	1
●	Washington St. and Lincoln Ave.	3
●	2nd St and Fair Way	1

Exhibit C-4
Pedestrian-Involved Collisions
2003 - 2012 City of Calistoga

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 C-4** Connectivity and safety were the key themes across the countywide comments.

TABLE C-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 “other” throughout the County 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 Yountville 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, a workshop was not held in this 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**

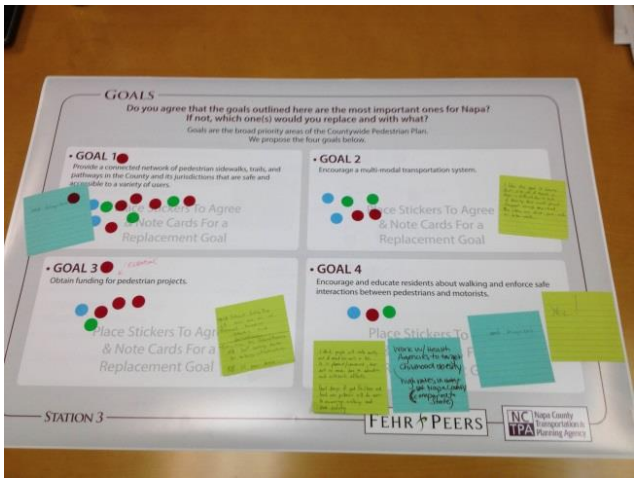
  At Station One, participants voted on a list of common barriers to walking to indicate which issues were most relevant to the walking environment in their jurisdiction and countywide. Participants also wrote comments on large-scale aerial maps placed on tables or on the floor to highlight existing barriers 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. 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 C-4. Examples of these miscellaneous comments included documentation of routes used by hotel guests in St. Helena, suggestions for aesthetic treatments to downtown crosswalks in Yountville, and suggestions for bike lanes. All 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.

- **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.



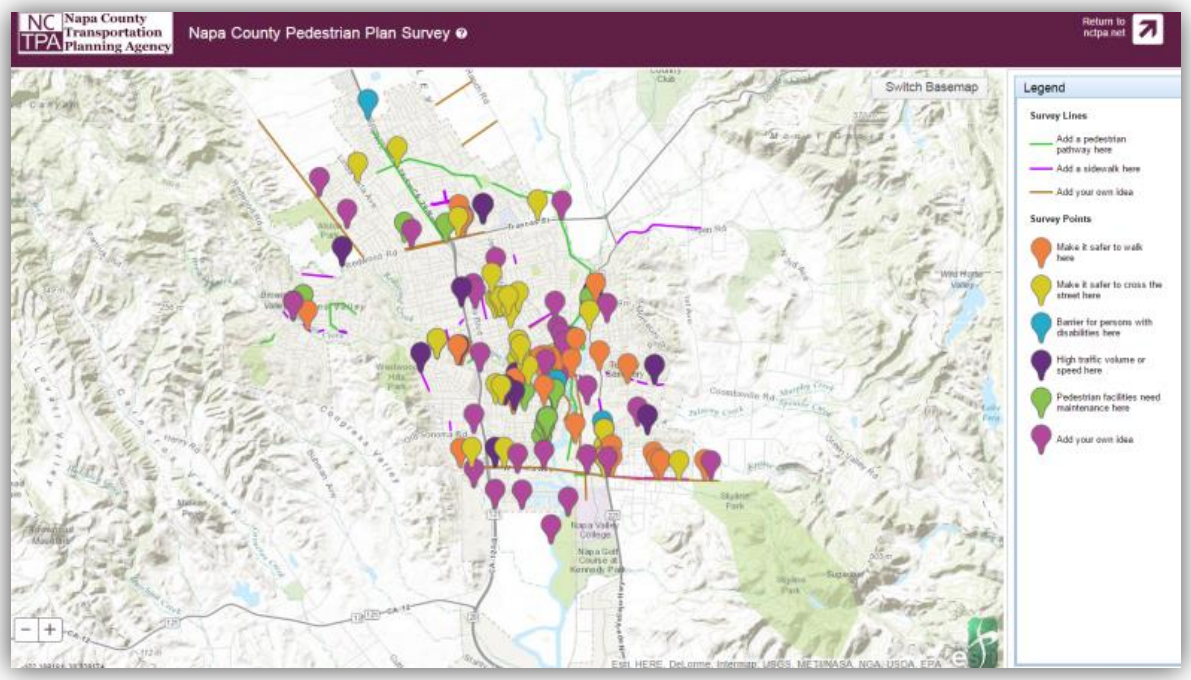
- **Station 4: Collision Maps**

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

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. No comments were received in the City of Calistoga.

Calistoga-Specific Focus Groups

At the outset of the plan development process, meetings were held with key staff from Calistoga to initiate the planning process on December 9, 2014.

This meeting included a discussion of existing programs, policies and practices. Recommendations for improvements are provided in the benchmarking summary table in **Appendix C-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 Calistoga staff, including traffic calming and preserving the rural character, and are incorporated into key programmatic and policy recommendations in this plan.

Additional focus group meetings were held for the Calistoga walking audit on April 14, 2015, and to review the list of suggested pedestrian projects on August 19, 2015.

Opportunity Areas

Calistoga's small-town feel, historic charm, numerous tourist destinations, and natural beauty create an enjoyable landscape for pedestrians. The city is also seeing growth and transition, and has recognized this moment as a key opportunity to enhance pedestrian safety and connectivity in concert with the development opportunities. The city has taken many recent steps in planning for a safer, more walkable community, focusing on the downtown core and safe routes to school in a Pedestrian Safety Assessment (PSA), completed in 2015 by UC Berkeley's Technology Transfer Program (Tech Transfer). This plan expands on those 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 Calistoga. More

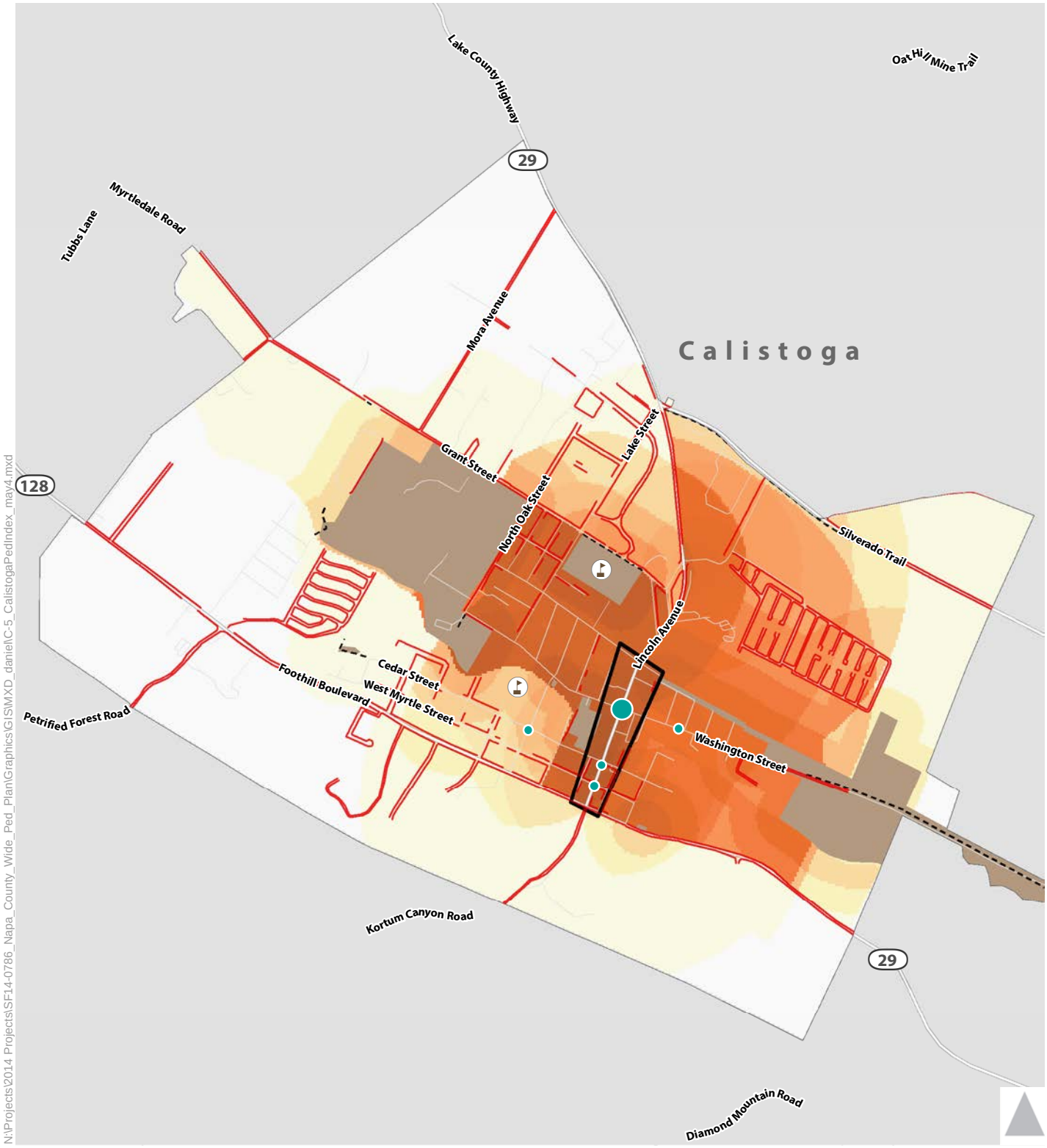
detail on the Ped INDEX methodology and results as well potential applications can be found in **Appendix B** of the countywide plan**.**

To balance high pedestrian demand areas with key areas of need in Calistoga, 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 C-5.

As illustrated on *Exhibit C-5*, Ped INDEX focus locations include the downtown core, Lake Street, Grant Street and North Oak Street. After discussion with city staff regarding candidate locations, the focus area that was chosen for study during walking audits for the Countywide Pedestrian Plan (approximately one mile) included:

- Cedar Street from Lincoln Avenue to Berry Street
- Berry Street from Cedar Street to Washington Street
- Washington Street from Berry Street to Lake Street
- Lake Street from Washington Street to Grant Street
- Grant Street from Lake Street to Stevenson Street
- Stevenson Street from Grant Street to Lincoln Avenue

Lincoln Avenue and Foothill Boulevard are also high pedestrian priority areas for the city, and these corridors were studied during walking audits for a separate Pedestrian Safety Assessment, completed in 2015 through the University of California at Berkeley's Technology Transfer Program. Projects suggested during these walking audits are referenced in this plan.



Demand:

Pedestrian Index Score

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1 2 3

Pedestrian Fatality

Missing Sidewalks

Legend:

Downtown

Parks

Trail/Path

School

Exhibit C-5

Calistoga - Pedestrian Index Demand & Deficiencies

Priority Project 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 for the Pedestrian Plan focus areas were conducted in April 2015 with key stakeholders to observe field conditions and brainstorm potential ideas for improvement. The following stakeholders attended walking audits in Calistoga:

- Erik Lundquist, Senior Planner City of Calistoga
- Mike Kirn, Public Works Director City of Calistoga
- Chris Canning, Mayor City of Calistoga
- Dieter Deiss, Member of Calistoga ATAC and NVTA ATAC
- Vicka Llamas, Principal Calistoga Elementary School
- Mitchell Celaya, Police Chief City of Calistoga
- Kaycee Wanless, Napa County Safe Routes to School

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 C-6. Descriptions of each project and additional program and policy recommendations are included below under Priority Projects.

Exhibit C-6

Calistoga - Project Locations

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. Using consistent prioritization criteria countywide, this plan includes a tiered list of projects for Calistoga reflecting:

- 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 C-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 C-C.** A summary of the improvements is shown in **Table C-5**.

Funded or Constructed Projects

The City of Calistoga is planning a bridge replacement project on Berry Street at the intersection of Washington Street, near Calistoga Elementary School. The project is funded, and will include a realignment of the intersection to straighten crosswalks and shorten crossing distances, to the extent feasible. This funded project was assigned to "Tier Zero" in Table C-5 and was not evaluated for prioritization.

TABLE C-5: CALISTOGA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
ON-GOING SYSTEM MAINTENANCE				
Sidewalk Gap Closure and Maintenance (No. 10 2015 CTP Program)	Citywide	Sidewalk maintenance, rehabilitation and expansion	Sidewalks Maintenance	$$$
TIER ZERO (FUNDED OR CONSTRUCTED PROJECTS)				
T0-1 Berry Street Bridge Replacement	Berry Street at Washington Street	Intersection alignment and crosswalk enhancements	Crossing Treatments Traffic Calming	--
TIER ONE IMPROVEMENTS				
C-1[2] Pedestrian Safety Improvements SR 29 & Cedar Street (No. 8 2015 CTP Project)	SR 29 (Lincoln Avenue) at Cedar Street	**Suggested Modifications to CTP Project**		
		Crosswalk enhancements[1]	Crossing Treatments ADA Ramps PSA Recommendations	$129,600
		Rapid Rectangular Flashing Beacons (RRFBs)if roundabout at Lincoln/Foothill is not installed	Crossing Treatments	$45,400
C-2 Pedestrian Safety Improvements SR 29 & Brannan Street (No. 9 2015 CTP Project)	SR 29 (Lincoln Avenue) at Brannan Street	**Suggested Modifications to CTP Project**		
		Feasibility study for roundabout or RRFBs	Crossing treatments Traffic calming PSA recommendations	$55,400
		Curb ramp location modifications	ADA ramps? Crossing treatments PSA recommendations	
		RRFB if roundabout is not installed	Crossing treatments	$45,400

TABLE C-5: CALISTOGA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
C-3 Washington Street Complete Streets (No. 10 2015 CTP Project)	Washington Street: Lincoln Avenue to N. Oak Street	Complete Streets Enhancements[3]	Complete Streets[3]	$$$
	Washington Street at Gerard Street	**Suggested Modifications to CTP Project**		
		Crosswalk enhancements[1]	Crossing treatments ADA ramps	
	Washington Street at Lincoln Avenue	Signal modifications and crosswalk enhancements[1]	Crossing treatments ADA ramps PSA recommendations Signal timing/operations	
C-4 PSA Recommendations South of Downtown	Foothill Boulevard: Pine Street to Elm Street	Sidewalks	Sidewalks	$$
	Lincoln Avenue at Foothill Boulevard	Roundabout feasibility study	Traffic Calming	
	Lincoln Avenue at Myrtle Street	Crosswalk enhancements[1] and trail improvements	Crossing treatments ADA ramps Pathway	
C-8 PSA Recommendations South of Downtown	Berry Street at Cedar Street	Crosswalk enhancements[1]	Crossing Treatments ADA Ramps	$
C-11 Grant Street Safe Routes To School Improvements	Grant Street: Lake Street to Stevenson Street	Near Term: Traffic calming and safety enhancements	Traffic Calming	$257,000
	Grant Street at Arch Way	Crosswalk enhancements[1]	Crossing Treatments	
	Grant Street at Stevenson Street	Intersection alignment and crosswalk enhancements[1]	Crossing Treatments	
	Grant Street: Lake Street to Stevenson Street	Long Term: Sidewalk	Sidewalk	$368,500
C-12 Grant Street and Wappo Avenue Pathway	Grant Street and Wappo Avenue; East of Stevenson Street	Pathway feasibility study	Pathway	$35,000

TABLE C-5: CALISTOGA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
C-13[2] Stevenson Street Safe Routes to School Improvements	SR 29 (Lincoln Avenue) at Stevenson Street	Intersection alignment, crosswalk enhancements[1] and traffic calming improvements	Crossing Treatments ADA Ramps PSA Recommendations Traffic Calming	$74,600
		RRFB if roundabout at Lincoln/Brannan is not installed	Crossing Treatments	$45,400
TIER TWO IMPROVEMENTS				
C-5 PSA Recommendations within Downtown Core	Lincoln Avenue: Fair Way to Cedar Street	Mid-block crosswalk enhancements[1] and greenery or art for pedestrian paseo	PSA Recommendations Crossing Treatments Paseos Place making	$$
C-6 PSA Recommendations at Fair Way	Lincoln Avenue at Fair Way	Signal modifications, crosswalk enhancements[1], and vehicle circulation modifications	Crossing Treatments Signal timing/operations PSA Recommendations Transit	$$
C-7[2] PSA Recommendations North of Downtown	Lincoln Avenue at Wappo Avenue	Crosswalk enhancements[1]	Crossing Treatments ADA Ramps	$$
	Lincoln Avenue, Wappo Avenue to Brannan Street	Sidewalks and lighting	Sidewalks Lighting	
C-9 Lake Street Traffic Calming	Lake Street, Washington Street to Lake County Highway	Traffic calming study	Traffic Calming	$$
C-10 Lake Street Sidewalk Gap Closure	Lake Street: Washington Street to Lake County Highway	Sidewalks	Sidewalks	$$$

TABLE C-5: CALISTOGA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
PREVIOUSLY PLANNED IMPROVEMENTS[4]				
C-14 Calistoga 2014 ATP Planned Sidewalk and Pathway Segments	Citywide	Sidewalks and pathways	Sidewalks	$$$

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. The downtown stretch of Lincoln Avenue serves as a frequent parade route for events in Calistoga. To accommodate these parades, the design of any infrastructure projects on Lincoln Avenue from Stevenson Street to Cedar Street should not preclude large vehicles driving down the center of the street. Any median refuges being considered between these limits, such as those recommended in Improvement C-1, C-7, and C-13 as crosswalk enhancements, will require a feasibility assessment.
3. Complete Streets enhancements are designed to accommodate all users, including pedestrian, bicyclists, transit riders, and motorists. For more information, refer to the Best Practices Toolkit, Appendix D of the Countywide Pedestrian Plan.
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.

PSA = Pedestrian Safety Assessment (PSA), completed for Calistoga in 2015 by UC Berkeley's Technology Transfer Program (Tech Transfer).

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

Source: Fehr & Peers, 2016

Preserving the rural character is of value to the community of Calistoga and is an important consideration in the design of pedestrian infrastructure. When feasible, physical improvements such as curb extensions and median refuges are preferred as crosswalk enhancements in lieu of flashing beacons. Rectangular rapid flashing beacons (RRFBs) should only be considered as a second phase, if additional traffic calming is desired, for Projects C-1, C-2, and C-13 to maintain this rural character.

Supporting Programs and Policies

Key program and policy recommendations that complement the engineering-related projects are shown below in **Table C-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 C-6: CALISTOGA PROGRAM AND POLICY RECOMMENDATIONS	
Program or Policy	**Recommendations**
Education and Encouragement	
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 *Countywide Implementation* chapter of the countywide plan.
Safety and Enforcement	
Law Enforcement for Pedestrian Safety	Coordinate with NVTA to provide resources to officers in Calistoga on pedestrian safety principles / best practices 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 *Countywide Implementation* 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.
Calistoga Elementary School Crossing Guard Training	Review crossing guard training and staffing to improve operations and reduce confusion.
Construction Coordination	Coordinate with stakeholders during traffic control plan development near key pedestrian nodes such as schools, parks and transit stops to ensure appropriate considerations for pedestrian circulation. Implement Policy 9.3 in the Calistoga ATP to require that construction projects minimize impacts to bicyclists and pedestrians through proper signage, equipment, and detours.
Maintenance	
Repair of Sidewalks, Crosswalks, and Curb Ramps	• 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 above. Determine feasibility of following the recommended timetable for maintenance activities in the Calistoga 2014 citywide ATP (Table 16, pg. 69-70). This could include efforts as part of the ADA Transition Plan and/or the trip and fall monitoring program. • Assign a point of contact in the Public Works Department to compile, track, and respond to routine bicycle and pedestrian maintenance issues in a timely manner (Policy 9.2, Calistoga ATP) • 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 include the reporting of maintenance needs for pedestrian-related pavement markings and traffic control devices.
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. Require adjacent property owners to maintain landscaped areas with live and healthy plant materials, replacing plant materials when necessary to maintain full function and aesthetics; to water, weed, prune, fertilize and keep sidewalks and planting strips litter free. Determine feasibility of implementing these monitoring activities based on the recommended timetable in the Calistoga citywide 2014 ATP (Table 16, pg. 69-70).

TABLE C-6: CALISTOGA PROGRAM AND POLICY RECOMMENDATIONS	
Program or Policy	**Recommendations**
Caltrans Coordination	Coordinate with Caltrans for sidewalk maintenance, crosswalk enhancements and curb ramp upgrades to directional along SR 29 (Lincoln Avenue)
Engineering and Design Standards	
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.
Place Making and Complete Streets	
Downtown Parking Plan	Develop parking plan to identify shared parking opportunities, consider parklets and mid-block crosswalks recommended in PSA report, and identify opportunities for bike parking to include bike corrals, which are an on-street bicycle parking facility that can accommodate up to 16 bicycles parked on racks in the same area as a single vehicle parking space.
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 small retail/commercial kiosks 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: http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf

Next Steps

Funding Sources

Sidewalks are included in Calistoga's Capital Improvement Program, with an annual funding level of approximately $50,000.

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 December 2015. 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 Calistoga through Caltrans, the Metropolitan Transportation Commission (MTC), and the Napa Valley Transportation Authority (NVTA).

Table C-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 C** 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, Highway Safety Improvement Program, and Transportation Development Act Article 3 funds.

TABLE C-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	◒	◒	◒	○

Note:

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 C-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 C-8: GENERALIZED UNIT COSTS FOR IMPROVEMENTS		
Facility Type	**Cost [1]**	**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, 2015.

Project-level cost estimates were prepared for the top 5 Tier One projects determined in the previous section of this plan, while the remaining projects were assigned a ranking in Table C-5 to indicate an estimated range of cost level. Prepared cost estimates, included in **Appendix C-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 C-9** below.

TABLE C-9: TIER ONE PROJECT SUMMARY COSTS

Project	Total Cost[1]
C-1: Pedestrian Safety Improvements SR 29 & Cedar Street (No. 8 CTP Project)	$175,000
C-2: Pedestrian Safety Improvements SR 29 & Brannan Street (No. 9 CTP Project)	$100,800
C-11: Grant Street SRTS Improvements	-
Near Term	**$257,000**
Long Term	**$625,500**
C-12: Grant Street and Wappo Avenue Pathway Study	$35,000
C-13: Stevenson Street Safe Routes to School Improvements	$120,000

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.

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.

Calistoga Appendix

C-A Benchmarking Table

C-B Existing Pedestrian Policies

C-C Detailed Project Lists and Prioritization

C-D Cost Estimates

C-E Plan Adoption Resolution

CHAPTER 3

St. Helena Plan

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Chapter 3

St. Helena Plan

Pedestrian Setting

St. Helena is a rural suburban community in northern Napa County. St. Helena has a small-town atmosphere with approximately 6,000 residents within four square miles. The city's downtown is an attractive pedestrian corridor lined with pedestrian-scaled lighting as well as shopping and restaurants that honor the region's esteemed wine industry. SR 29 (Main Street) runs through the downtown core and carries high traffic volumes with frequent congestion. The downtown only has a few marked crosswalks, which presents challenges for pedestrians navigating traffic to cross the street. Sidewalk gaps are also common. New development south of the Sulphur Creek Bridge on Main Street as well as existing nearby attractions such as Gotts Roadside burger stand, a popular local eatery, and several hotels and inns present the need for improved sidewalk facilities that connect to downtown. The land use patterns for the city are shown in *Exhibit SH-1.* An interactive city destination map, including the locations of public buildings, shopping and tourist attractions, is provided on St. Helena's website and can be found at the following link: http://visitingmedia.com/collections/city-of-st-helena-california/.

Existing Policies and Programs

To help guide the development of key programs and policies for this plan, St. Helena'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 SH-1**, the City of St. Helena has worked to create a pedestrian-friendly community through the adoption of several pedestrian-oriented ordinances and the implementation of reduced speed zones. This plan provides a framework for additional investments to create an accessible, connected pedestrian network citywide. Particular areas of opportunity that this plan addresses directly are the development of a pedestrian facility inventory, completion of walking audits, and collection of pedestrian volumes. The full benchmarking analysis for St Helena, with associated recommendations, is presented in **Appendix SH-A**.

TABLE SH-1: ST HELENA BENCHMARKING HIGHLIGHTS

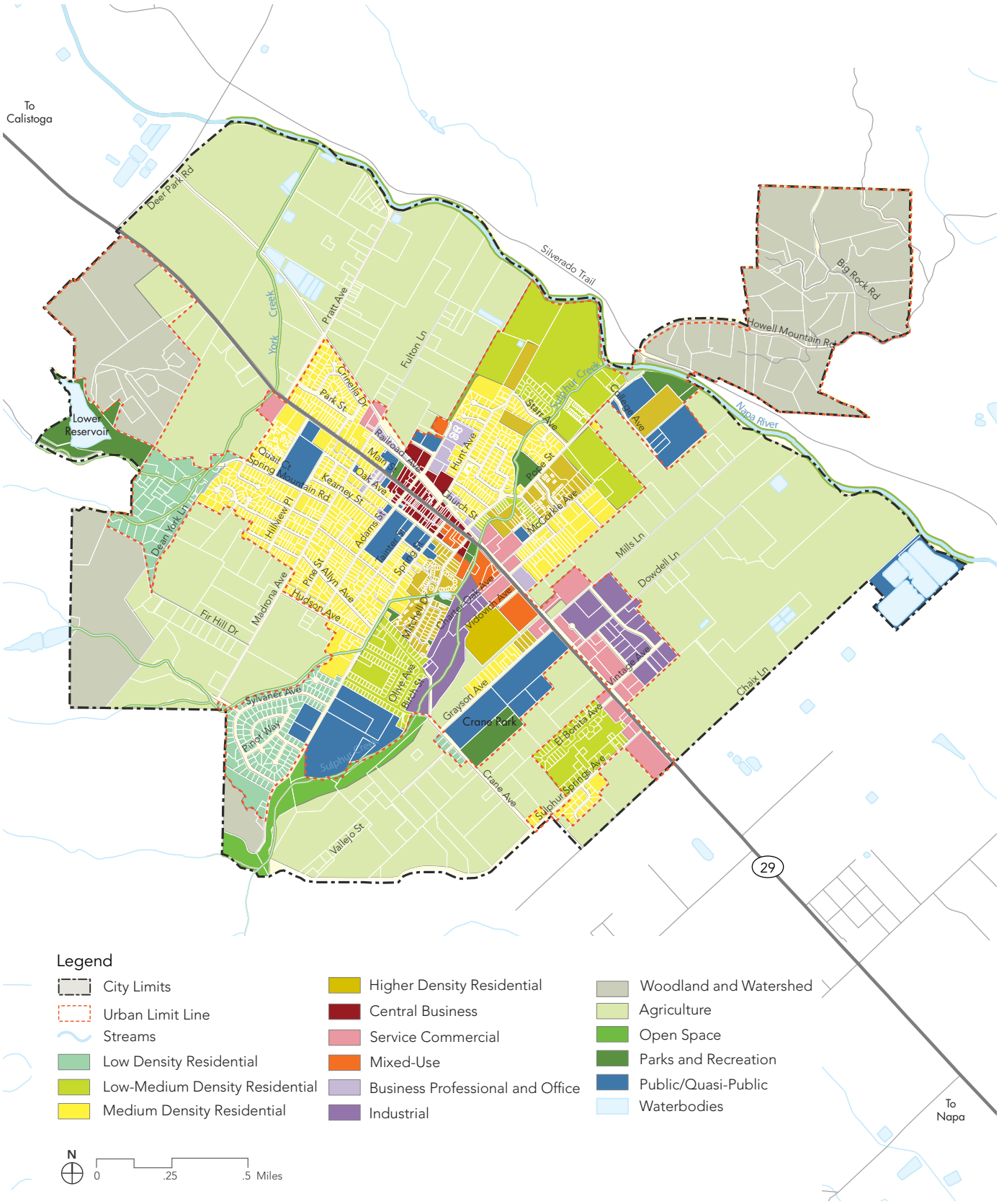
Plans, Policies, & Programs	St. Helena Current Practice	Best Practice Examples
Key Strengths		
ADA Transition Plan Involving non-traditional partners such as public health agencies, pediatricians, etc., in the planning or design of pedestrian facilities may create opportunities to be more proactive with 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.[1]	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. In St. Helena, health agencies are involved in the development review process, but there is no special involvement for pedestrian facilities. Live Healthy Napa County completed the first ever Napa County Community Obesity Prevention Plan (Jan. 2015), which addresses the need to increase active transportation options countywide.	• Seek opportunities to meet goals in the CHIP related to active transportation, such as improving the built environment by ensuring all necessary sidewalk repairs are included in the city's Capital Improvement Program (CIP), and including additional pedestrian infrastructure projects in the program. Consider a trip and fall monitoring program and/or incorporating public comment from the recommended online comment form under Public Involvement below. • Continue to involve health agencies in the development review process, especially when it related to active transportation improvements. • Ensure consistency with the CHIP by seeking partnership opportunities between health agencies and SRTS Safe Routes to School to expand the reach of education and promotion of walking.

TABLE SH-1: ST HELENA BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**St. Helena Current Practice**	**Best Practice Examples**
Complete Streets Policy Routine Accommodations or Complete Streets Policies accommodate all modes of travel and travelers of all ages and abilities.	The City of St. Helena has a Complete Streets Policy resolution which follows the template provided by MTC. The next update to the General Plan will incorporate Complete Streets policies and principles; however, it has yet to be adopted. For implementation of the Complete Streets policy, designs of projects affecting the transportation system must be reviewed by the Active Transportation Committee for consistency with the Vine Trail plans and the Countywide Bicycle Plan. Routine data collection is also required to evaluate how well all users are being served by the transportation network. Commercial and residential development projects are required to include sidewalks and the city additionally requests ADA-compliant driveway designs during development review.	• Consider opportunities for Complete Streets, specifically pedestrian pathways and/or sidewalks, during restriping, repaving, new roadway construction, and utility installation projects. • Follow MTC's checklist procedure and guidelines for project review to ensure routine application of the Complete Streets policy. • Consider maintaining a GIS database of data collected as part of the policy evaluation, to include pedestrian volumes collected in this plan.
Newspaper Rack Ordinance 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.	St Helena has an ordinance which requires the placement and maintenance of a news rack not to interfere with building access or reduce the pedestrian travel way to less than six feet.	
Street Tree Ordinance 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 utilities.	The St Helena Tree Committee developed the Master Street Tree List, a guide that organizes trees into categories depending on the recommended street type (large commercial, major in-town streets, and small neighborhood streets). The guide includes a list of undesirable trees, in accordance with the city's street tree ordinance, which lists trees that cannot be planted without proper root-control barriers due to their potential to cause damage to sidewalks. According to the St Helena tree ordinance, property owners are responsible for repairing sidewalk damage by trees fronting their property, while the city takes responsibility for trimming and maintaining trees on Main Street.	
Speed Limits and Speed Surveys 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.	Engineering speed studies are prepared every 5 years in St Helena, in accordance with state law. The city does use reduced speed limits of 15 mph in school zones as needed. De facto speed limits are 25 miles per hour.	• Proactively consider pedestrian volumes when setting speed limits, and consider traffic calming in pedestrian zones where speed surveys suggest traffic speeds are too high. • Ensure design standards in pedestrian areas do not contribute to a routine need for traffic calming.

TABLE SH-1: ST HELENA BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**St. Helena Current Practice**	**Best Practice Examples**
Key Opportunities		
Sidewalk or Street Furniture Ordinance 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.	St Helena has no specific street furniture ordinance, but sidewalk dining is allowed with a permit in the zoning code. A four feet clear path of travel must be maintained.	• 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.
Inventory of Pedestrian Facilities A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc.	The city does not have a GIS inventory of sidewalks or other pedestrian facilities, although trails and pathways are shown graphically in the City Bicycle Master Plan. Sidewalks are included in the City's Capital Improvement Program and has budgeted approximately $17,000/year for the last 3 years for sidewalk repairs, although not all of it was spent.	• This plan has developed a GIS-based inventory of sidewalks, curb ramps, crosswalks, and paths Citywide. This facility inventory could be expanded to include informal pathways and potential pedestrian opportunity areas in the City. • Consider implementing a trip and fall monitoring program and/or mapping public comment from the recommended comment form to ensure all necessary sidewalk repairs are included in the City's Capital Improvement Program (CIP).
Walking Audit Program 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. They can be led by city staff, advocacy groups, neighborhood groups, or consultants.	St. Helena has not conducted pedestrian walking audits before this plan.	• 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.
Pedestrian Volumes Pedestrian volume data is important for prioritizing projects, developing collision rates, and determining appropriate pedestrian infrastructure.	The City of St Helena does not collect pedestrian volumes as a matter of routine.	• Use collected volumes in this plan to identify pedestrian nodes in the next update to the General Plan. • Routinely collect pedestrian and bicycle volumes by requiring them to be conducted in conjunction with all traffic studies and manual intersection turning movement counts. • 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.

Notes:

1. 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



Legend

- City Limits
- Urban Limit Line
- Streams
- Low Density Residential
- Low-Medium Density Residential
- Medium Density Residential
- Higher Density Residential
- Central Business
- Service Commercial
- Mixed-Use
- Business Professional and Office
- Industrial
- Woodland and Watershed
- Agriculture
- Open Space
- Parks and Recreation
- Public/Quasi-Public
- Waterbodies

N

0 .25 .5 Miles

Source: St. Helena General Plan Update 2035, Draft Version September 8, 2015.

\\fpsf03\data\Projects\2014 Projects\SF14-0786_Napa_County_Wide_Ped_Plan\Graphics\PDF\LandUse\AI

Exhibit SH-1

St. Helena - Land Use Map

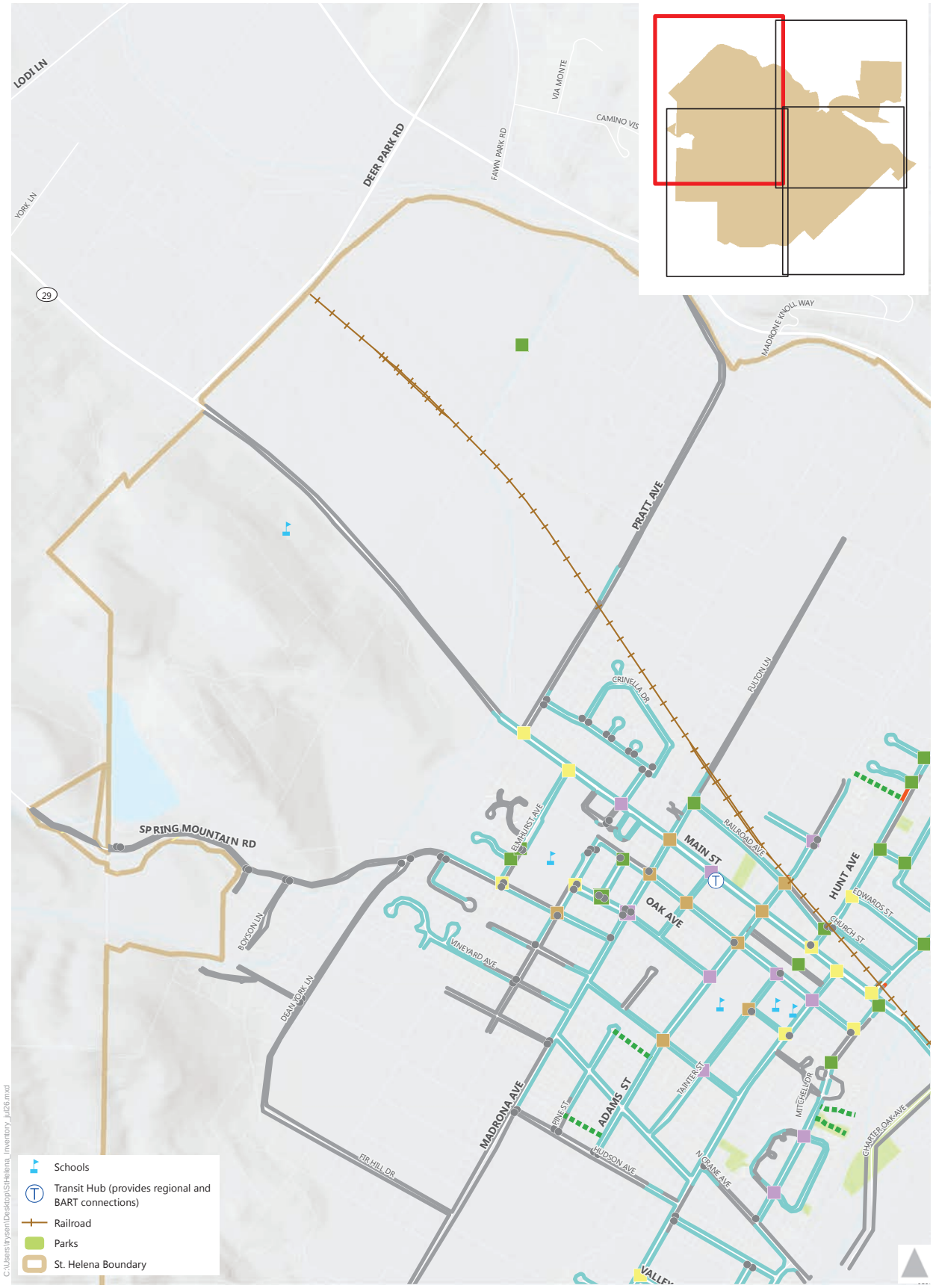
Existing Pedestrian Infrastructure

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.

St. Helena Inventory

Pedestrian facilities were inventoried for the entire roadway network in St Helena. As shown in *Exhibit SH-2*, the majority of missing sidewalks is located on the outer edges of the city. Streets with sidewalk gaps that were identified by city staff as potential or existing pedestrian desire lines include north-west corridors Main Street and Hudson Avenue and east-west corridors Grayson Avenue and Mitchell Drive. According to city staff, Pope Street is a common route for seniors who walk from their homes into town. Although Pope Street has sidewalk along at least one side of the street between College Avenue and Main Street, *Exhibit SH-2* shows locations where sidewalk is missing on both sides or where the sidewalk is asphalt, which typically requires more maintenance than concrete sidewalks.



Pedestrian Inventory

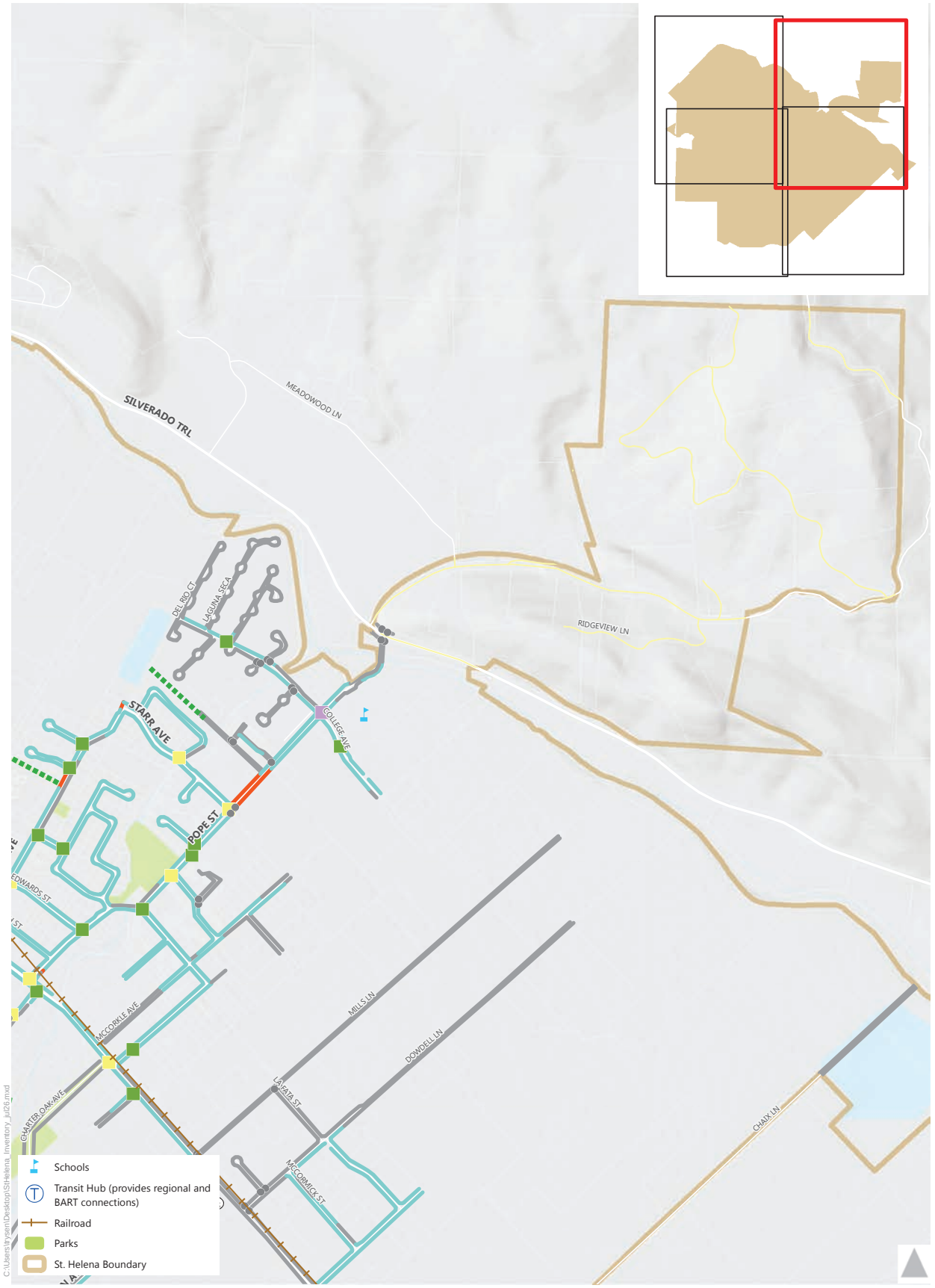
Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4

- Missing Curb Ramp
- Roads not Surveyed

Exhibit SH-2a
Pedestrian Facility Inventory
City of St. Helena



Pedestrian Inventory

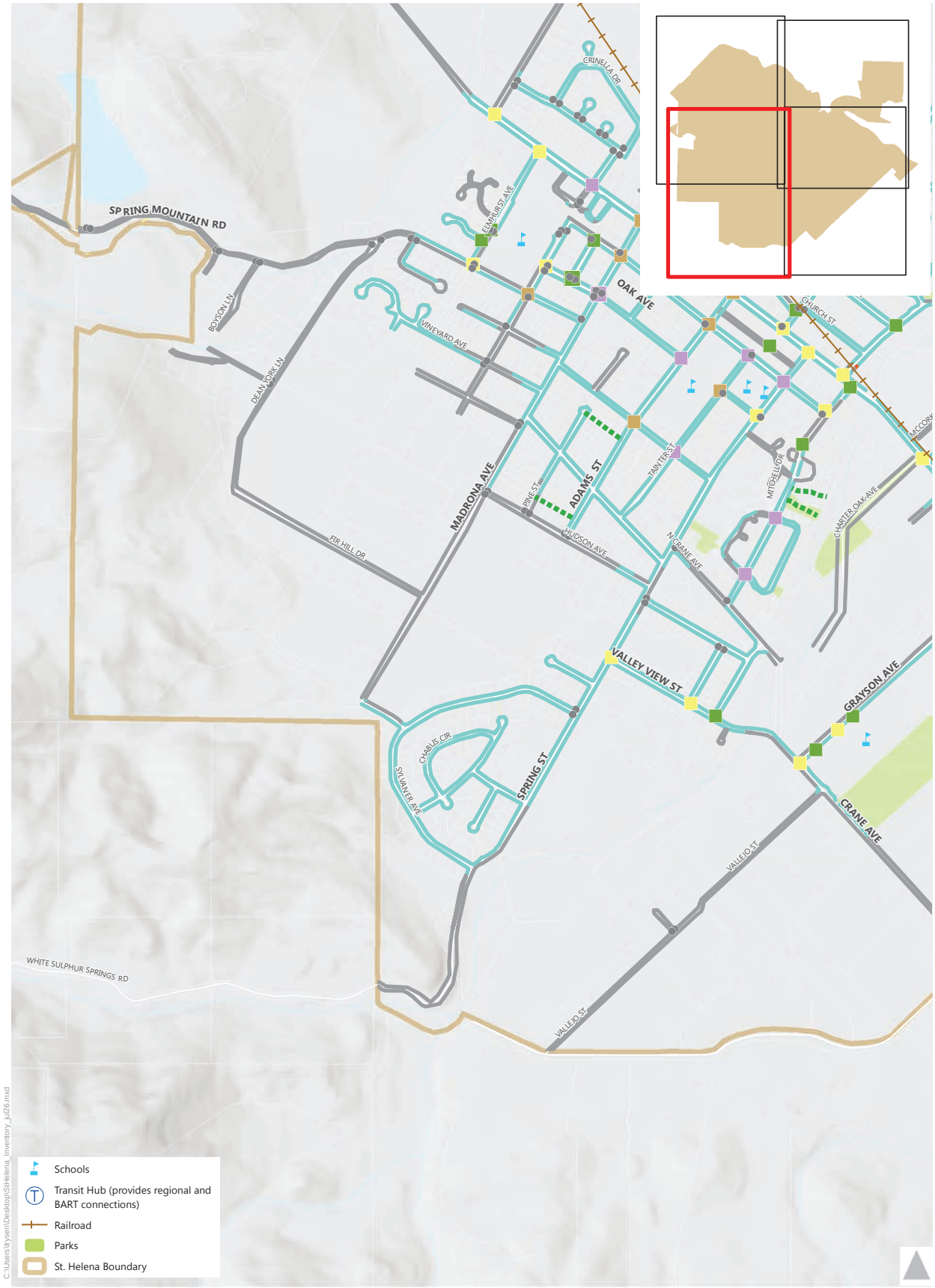
Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4

- Missing Curb Ramp
- Roads not Surveyed

Exhibit SH-2b
Pedestrian Facility Inventory
City of St. Helena



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Pedestrian Inventory

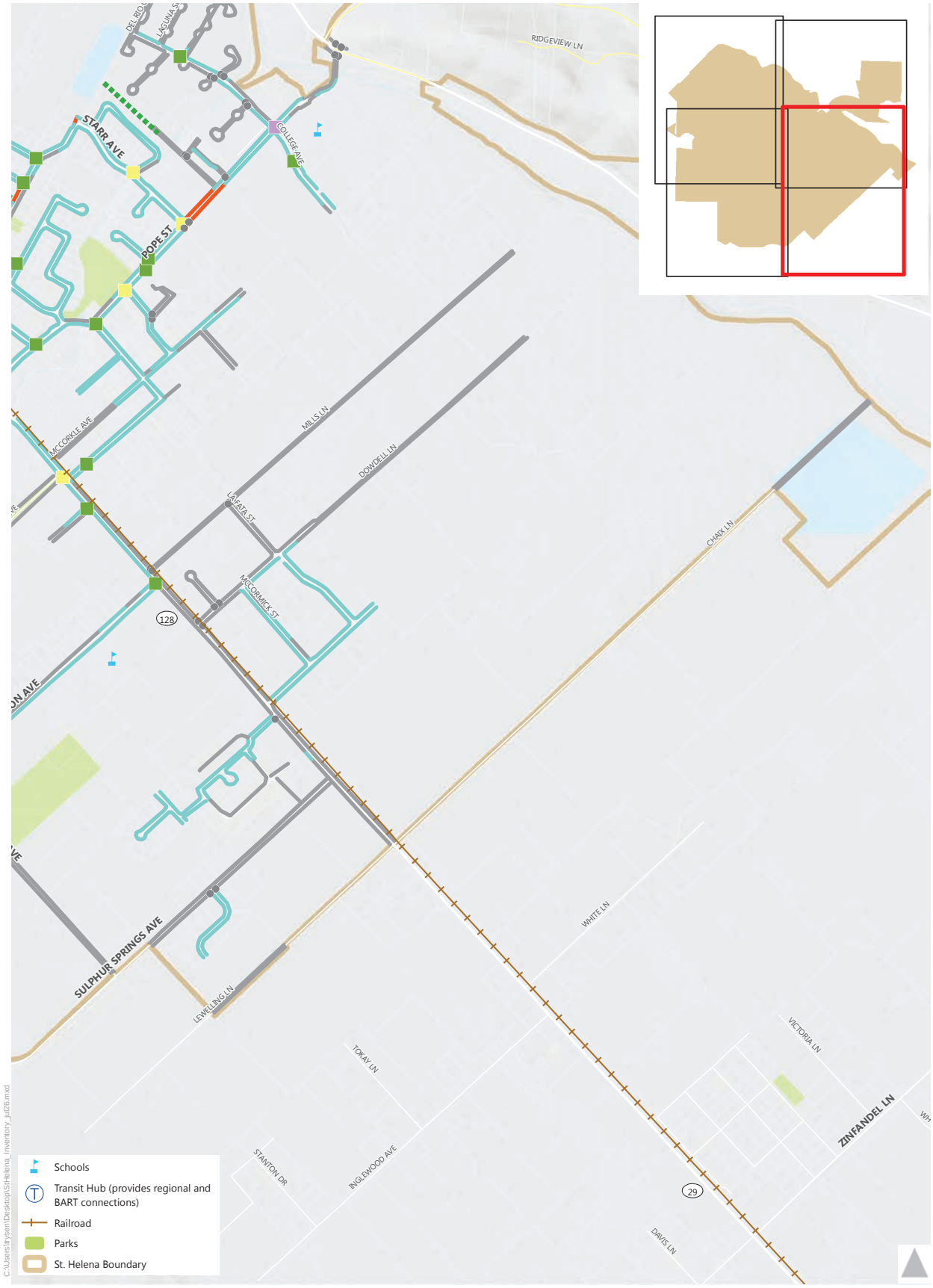
Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4

- Missing Curb Ramp
- Roads not Surveyed

Exhibit SH-2c
Pedestrian Facility Inventory
City of St. Helena



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4

- Missing Curb Ramp
- Roads not Surveyed

Exhibit SH-2d
Pedestrian Facility Inventory
City of St. Helena

Activity Levels

Pedestrian counts were conducted at eight locations throughout St. Helena in October and November 2015. These locations were selected based 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 SH-2** provides a summary of the two-hour counts completed within the city. Count results varied significantly based on nearby population density, as well as by the adjacent land use.

TABLE SH-2: ST. HELENA COUNT PROGRAM LOCATIONS

ID	Jurisdiction	Location	Morning	Evening	School	Weekend
			7-9AM	4-6PM	2-4PM	12-2PM
SH1	St. Helena	Main St. and Pope Street	55	134		
SH2	St. Helena	Main Street at Adams Street	112	321		798
SH3	St. Helena	Hunt Avenue at Proposed Path (1)	23	37		
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

The highest rates of walking in St. Helena during all time periods were observed at the intersection of Main Street and Adams Street in downtown St. Helena. This location is in close proximity to several shops and restaurants, and is currently a signalized intersection with crosswalks across two of the intersection's three crossings. The highest observed pedestrian activity at this location was midday (12-2 PM) on Saturday, when nearly 800 crossings took place during the two-hour count period. Several other lower counts were also conducted along Main Street.

Counts were conducted at three locations in close proximity to St. Helena schools; two counts were conducted near St. Helena High School (SH5 and SH6) and one count location was selected near Robert Louis Stevenson Middle School (SH7). Counts at all schools showed fewer than 20 pedestrians over each two-hour period.

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 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.

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).

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 SH-3 shows the locations of these pedestrian collisions in St Helena.

Exhibit SH-3 presents raw collision counts only. While this is illustrative of "hot spot" areas in St Helena, 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

St Helena has the highest number of reported collisions per capita in the county, at approximately one reported collision for every 200 residents. Collision locations are concentrated near Main Street (SR 29) between Madrona Avenue and Pope Street, close to the downtown core. Collision hotspots include the intersection of Main Street and Adams Street, with four reported injury collisions over the last ten years, and Main Street at Fulton Lane with two injury collisions.

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.

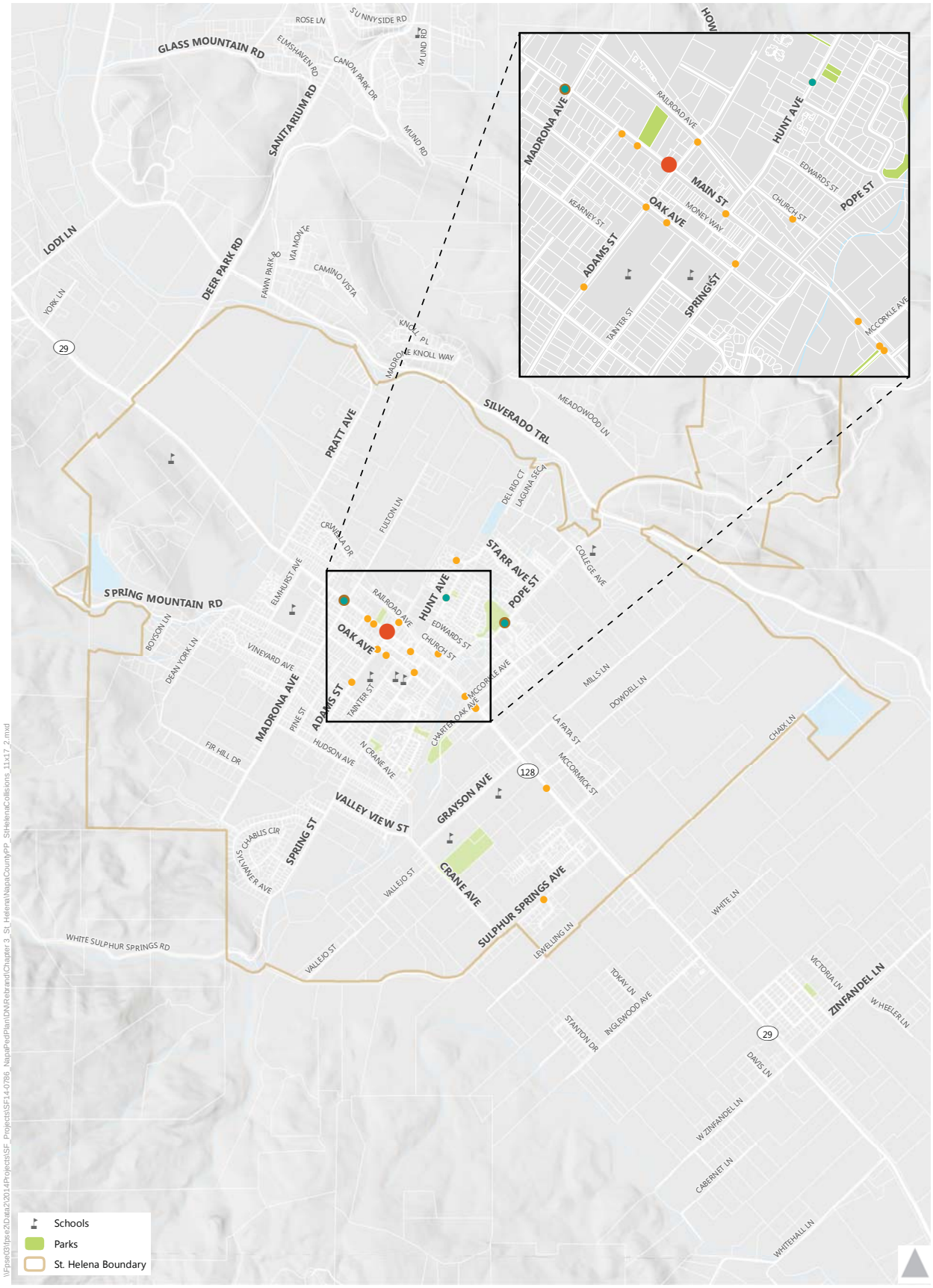
Pedestrian Actions

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 SH-3**, pedestrian safety issues surrounding collisions are typically focused around crossing locations.

TABLE SH-3: ST HELENA COLLISION SUMMARY PEDESTRIAN ACTIONS (2003-2012)			
Pedestrian Action	Number of Collisions		
	Injury	Fatality	Total[1]
Crossing in Crosswalk at Intersection	12	2	14
Crossing Not in Crosswalk	8	0	8
Walking In Road, Including Shoulder	3	0	3
Walking, Not in Road	2	1	3

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

Source: SWITRS



Pedestrian-Involved Collisions 2003-2012

1	Fatal Collision	
1	Injury Collisions	
2		
3 - 4		

Pedestrian Collision Hotspots

Density	Intersection	Total Collisions
	Main St. and Fulton Ln.	2
	Pope St. and Mariposa Ln.	2
	Main St. and Adams St.	4

Exhibit SH-3
Pedestrian-Involved Collisions
2003 - 2012 City of St. Helena

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 SH-4**. Connectivity and safety were the key themes across the countywide comments.

TABLE SH-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 "other" in St. Helena 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.

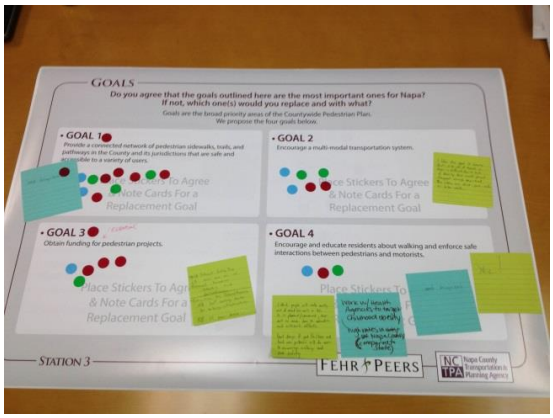
Public workshops were held throughout the County in Winter 2015: in Napa on January 22 at NVTA; in Yountville on January 27; in St. Helena on January 28; and in American Canyon on February 4. Due to recent public workshops held in Calistoga through development of their Active Transportation Plan in 2014, 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**

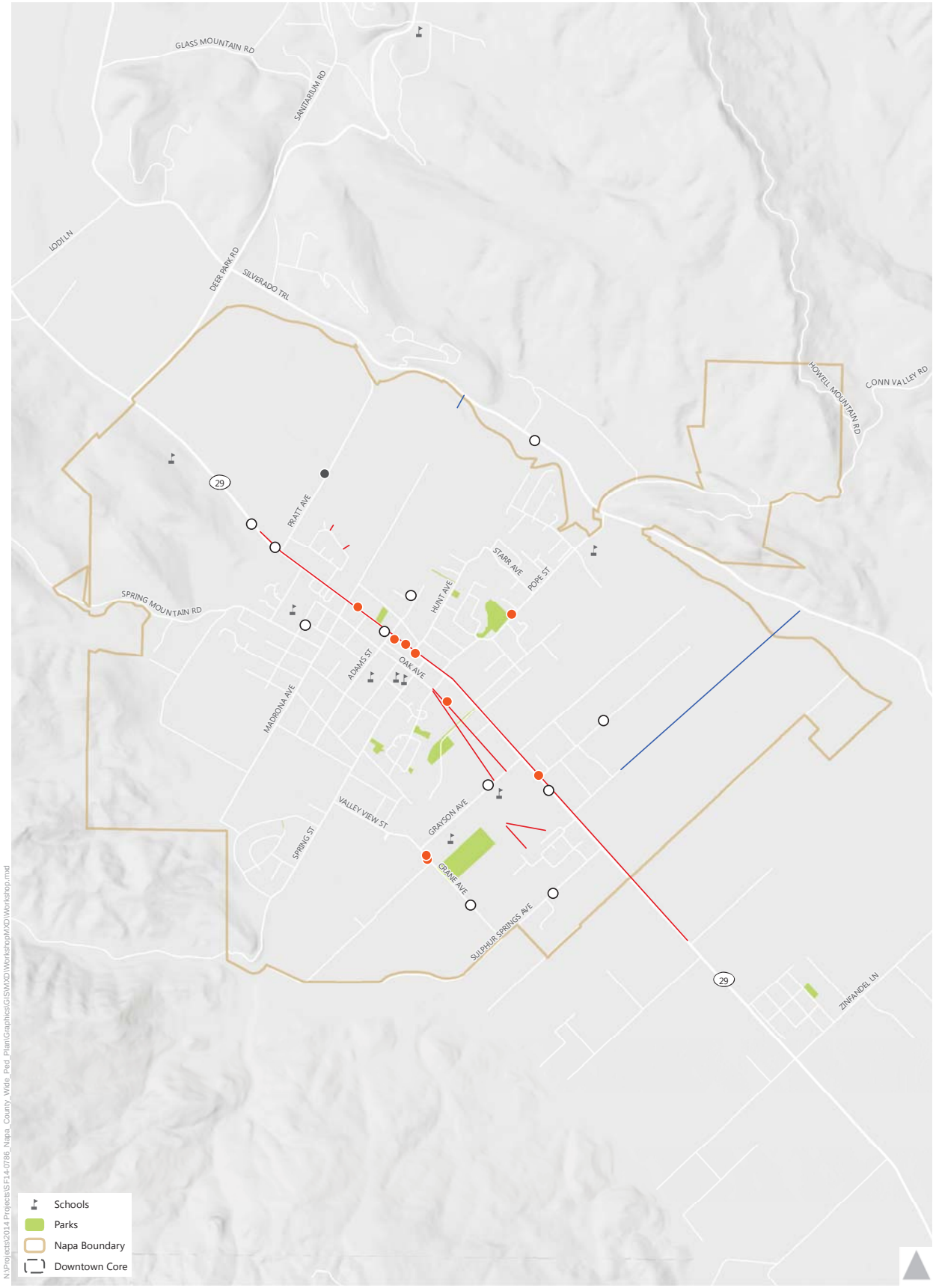
  At Station One, participants voted on a list of common barriers to walking to indicate which issues were most relevant to the walking environment in their jurisdiction and countywide. Participants also wrote comments on large-scale aerial maps placed on tables or on the floor to highlight existing barriers 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 30 comments in the City of St Helena, shown in *Exhibit SH-4*. 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 SH-4. Examples of these miscellaneous comments included documentation of routes used by hotel guests, suggestions to relocate parking off of Main Street, ideas to open up pedestrian alleyways in a residential neighborhood near Robert Louis Stevenson Middle School, and recommendations to reduce existing cross-sections on roadways in the south of town to accommodate pedestrian facilities. 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.
- **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.



Safety
Maintenance
ADA
Other
Sidewalk/Pathway
Other

0 0.5 1 Mile

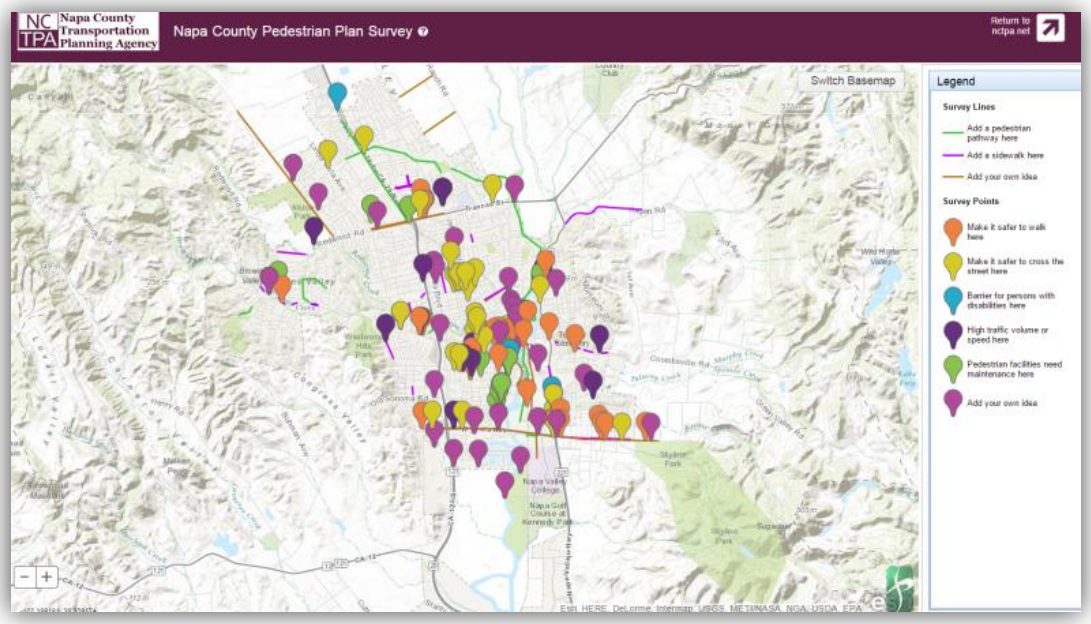
Exhibit SH-4

Workshop Comments
St. Helena

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.

St Helena-Specific Focus Groups

At the outset of the plan development process, meetings were held with key staff from St. Helena to initiate the planning process on December 17, 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 SH-A**.

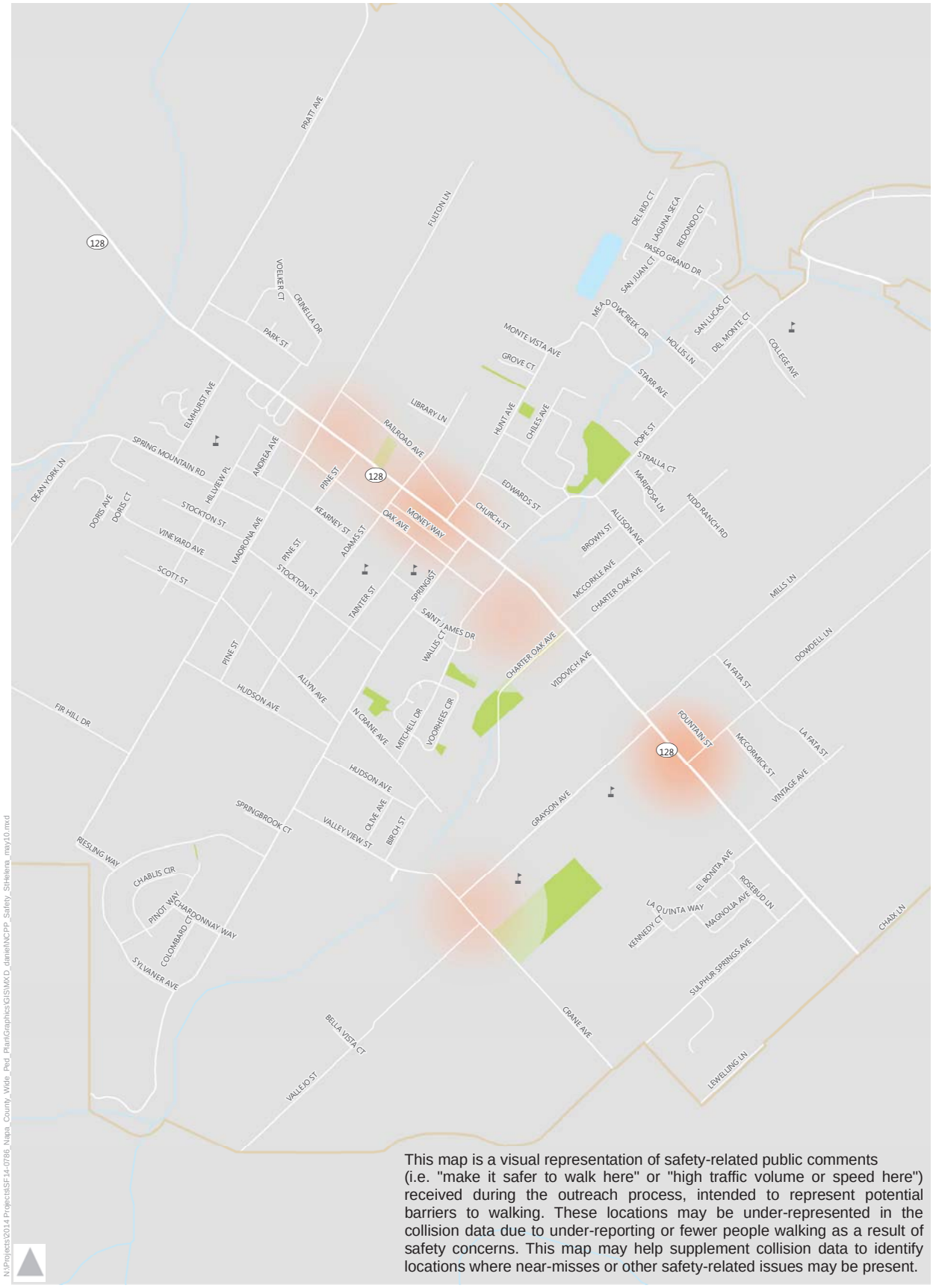
Jurisdiction staff also provided input during the initial benchmarking meeting and at the public workshops on key areas where pedestrian improvements are planned and in some cases, where connections and safety improvements are desired. This input was used to inform potential opportunities for walking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

Additional focus group meetings were held for the St. Helena walking audit on May 12, 2015, and to review the list of suggested pedestrian projects on August 12, 2015.

Perceived Barriers

As shown in **Table SH-4**, connectivity and safety are two of the top pedestrian issues identified from the public. To geographically visualize the safety concerns in St Helena, a heat map was created, shown in Exhibit SH-5. 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[3] 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.

[3] 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



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.

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0 0.25 0.5 Mile

Schools

Parks

St. Helena Boundary

Safety-Related Comments

Many Issues (2) ← Few Issues (0)

Exhibit SH-5

Perceived Barriers: As Visualized by Safety-Related Public Comments

City of St. Helena

Opportunity Areas

St. Helena's small-town feel, narrow residential roadways, numerous shopping and dining options and natural beauty create an attractive pedestrian environment. The city has seen recent growth and transition and has recognized this moment as a key opportunity to enhance pedestrian safety and mobility with the development of their General Plan update and new city leadership. This plan expands on those 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 St. Helena. 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 St. Helena, 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 SH-6*.

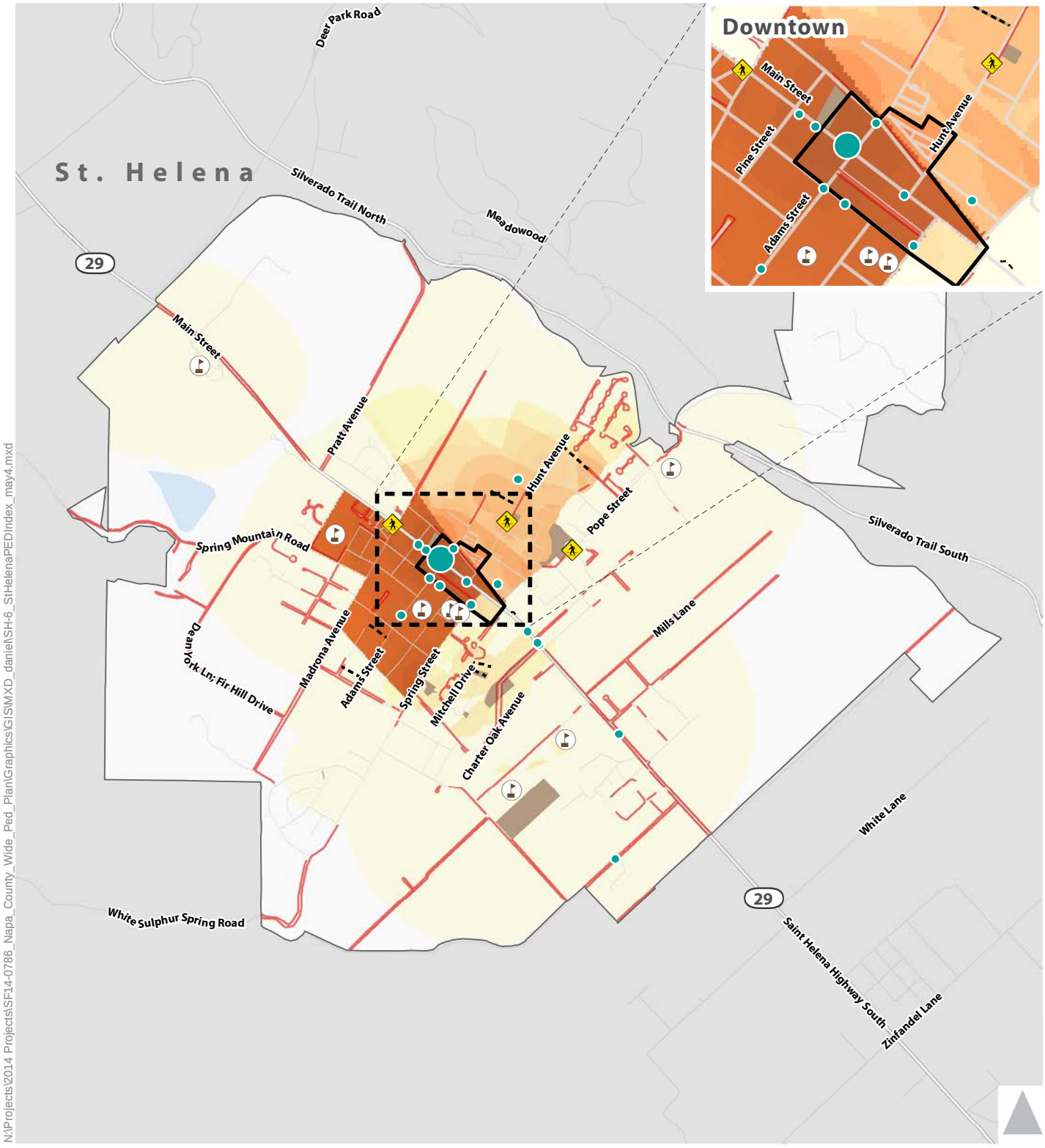
As illustrated on *Exhibit SH-6*, Ped INDEX focus locations include the downtown core and neighborhood pockets near St. Helena Elementary School, High School, and Robert Louis Stevenson Middle School. Feedback at the public workshop yielded multiple requests for reducing parking on Main Street and improved crossings while managing the vehicle congestion. After reviewing the locations of all 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:

- **Hotels and High School**: Grayson Avenue and Crane Avenue along school frontage; Main Street between Grayson Avenue and Sulphur Springs Avenue (1.1 miles)
  This route includes the area with the shared concern from the city and the public that visitors staying in hotels on El Bonita Avenue and Sulphur Springs Avenue at the southern city limits use Main Street (SR 29) to walk into town, which has discontinuous sidewalks and facilities with maintenance needs. Other concerns in the area, voiced by both the city and the public, include speeding along the high school on Grayson Avenue and Crane Avenue, limited pedestrian connections to Grayson Avenue, and limited

pedestrian facilities along Grayson Avenue and Crane Avenue. Crossing challenges at Main Street to the bus stop at Dowdell Lane, a request from the public workshops, are also located on this route.

- **Downtown and Pope Street:** Main Street from Pine Street to Pope Street/Mitchell Drive; Pope Street from Main Street to Paseo Grand Drive (1 mile)
  Collision data shows clusters of collisions have occurred in the core of downtown between Hunt Avenue and Pine Street, with the largest concentration at the intersection of Main Street and Adams Street (four collisions in the last ten years). This area also features high pedestrian activity levels and key tourist attractions.

After discussions with city staff regarding candidate locations, a combination of the above recommended focus areas, for a total of approximately one mile, was chosen for study during walking audits: Main Street from Pine Street to Sulphur Springs Avenue.



Demand:

Pedestrian Index Score

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1 2 4 5-7

Pedestrian Fatality

Missing Sidewalks

Legend:

Major Retail

Parks

Trail/Path

School

Exhibit SH-6

St. Helena - Pedestrian Index Demand & Deficiencies

Priority Project 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 key stakeholders to observe field conditions and brainstorm potential ideas for improvement. The following stakeholders attended walking audits in St. Helena:

- Steve Palmer, Director of Public Works
- Alan Galbraith, Mayor
- Jim Haller, Park Supervisor/City Arborist
- Mary Sherman, Senior Advocate
- Sergio Ruiz, Caltrans

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 SH-7*. Descriptions of each project and additional program and policy recommendations are included below under *Priority Projects.*

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Exhibit SH-7

St. Helena - Project Locations

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. Using consistent prioritization criteria countywide, this plan includes a tiered list of projects for St. Helena reflecting:

- 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 SH-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 SH-C.** A summary of the improvements is shown in **Table SH-5**.

Funded or Constructed Projects

The City of St. Helena recently secured funding for a sidewalk gap closure project on Mitchell Drive through the Transportation Development Act Article 3 funds, or TDA-3, available through MTC. This project will connect residential neighborhoods with an adjacent commercial center and a nearby school. Recommended pedestrian improvements are also being considered by Caltrans as additions to a funded signal project at Main Street and Grayson Avenue, which is currently in the final stages of design. These recently completed and funded projects were assigned to “Tier Zero” in **Table SH-5** and were not evaluated for prioritization.

TABLE SH-5: ST HELENA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
ON-GOING SYSTEM MAINTENANCE				
Sidewalk Gap Closure and Maintenance (No. 29 2015 CTP Program)	Citywide	Sidewalk maintenance, rehabilitation and expansion to include 29 miles of Citywide sidewalk gap closure	Sidewalks Maintenance	$$$
TIER ZERO (FUNDED OR CONSTRUCTED PROJECTS)				
T0-1 Additions to Planned Projects	Main Street at Grayson Avenue	Marked crosswalks on all legs with crosswalk enhancements and directional curb ramps for west leg crosswalk	Crossing treatments ADA ramps	-
T0-2 Mitchell Drive Sidewalk	Mitchell Drive, Oak Avenue to St. James Court	Sidewalk on the north side of the street	Sidewalk	-
TIER ONE				
SH-1 RLS Middle School Sidewalk and Hunt Avenue Improvements	Hillview Place, Spring Mountain Road, Elmhurst Avenue at RLS Middle School	Sidewalks	Sidewalk	$399,000[2]
	Hunt Avenue, Monte Vista Avenue to June Lane	Sidewalks	Sidewalks	
	Hunt Avenue at Edwards Street, Hunt Avenue at June Lane	Curb ramp upgrades	ADA Ramps	
	Hunt Avenue, Grove Court to June Lane	Class I pathway and enhanced1 midblock crosswalk	Crossing treatments Pathway	
SH-2 Downtown Pedestrian Improvements (No. 35 2015 CTP Constrained Project)	Main Street, Spring Street to Adams Street	Sidewalk upgrades and streetscape improvements	Maintenance Sidewalks Place making	$1,355,900
		Traffic calming (such as bulb outs)	Traffic calming	
	Main Street at Pine Street	Crosswalk enhancements and tree trimming	Crossing treatments ADA ramps Maintenance	
	Main Street at Adams Street	Crosswalk enhancements and tree trimming	Crossing treatments ADA ramps	

TABLE SH-5: ST HELENA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
			Maintenance	
	Main Street at Hunt Avenue	Enhanced marked crosswalk	Crossing treatments ADA ramps	
		Pedestrian wayfinding	Wayfinding	
	Main Street at Spring Street	Enhanced marked crosswalk	Crossing treatments ADA ramps	
	Main Street – Entire Corridor	Raised median	Traffic calming	
		Pedestrian paseo / alley way study	Wayfinding Place making	
SH-3 Sulphur Creek Class I Multi-Use Pathway (No. 36 on Constrained CTP Project List)	Sulphur Springs Avenue to Napa River	Class I Multi-Use Path	Pathway	$$$
SH-4 Napa River Class I Multi-Use Pathway (Unconstrained 2015 CTP Project)	Napa River from South City Limit to North City Limit	Class I Multi-Use Path	Pathway	$$$
SH-5 SHUSD Main Street Frontage Sidewalk	Main Street, Grayson Street to Dowdell Lane	Sidewalk	Sidewalk	$184,300
SH-6 Downtown Operations Study	Main Street, Pine Street to Mitchell Drive	Signal coordination study and assessment of pedestrian signal timing improvements	Signal timing/operations	$53,000
	Main Street at Pope Street	Roundabout feasibility study to include analysis of circulation modifications as alternative	Signal timing/operations	
SH-9 Main Street ADA Improvements	Main Street, Spring Street to Pop Street	ADA driveways	ADA	$137,700
	Main Street, Dowdell Lane to El Bonita Avenue	DG pathway	Pathway	
	Main Street at El Bonita Avenue	Sidewalk repair	Maintenance	

TABLE SH-5: ST HELENA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
	Main Street at St Helena Chamber of Commerce	Detectable warning strip along sidewalk	ADA	
TIER TWO				
SH-7 Main Street Business Frontage Improvements	Main Street at Pope Street	Sidewalk activation considerations	Place making	$$
	Main Street at Gott's	Driveway closure		
		Wayfinding and landscape improvements		
SH-8 Main Street SRTS Improvements	Main Street at Charter Oak Avenue	Enhanced marked crosswalk with RRFBs	Crossing Improvements ADA ramps	$$
		Crosswalk enhancements		
	Main Street at Vidovich Lane	Enhanced marked crosswalk		
SH-10 Main Street/ Dowdell Transit Access Improvements	Main Street at Dowdell Lane	Bus stop relocation	ADA ramps Sidewalks Crossing Improvements	$$
SH-11 South St Helena/ Unincorporated Connection	Main Street at El Bonita Avenue to Inglewood Avenue	Sidewalk or enhanced marked crosswalk for Vine Trail connection	Sidewalks Crossing Improvements	$$$[3]
SH-12[4] Sulphur Creek Crossing	Southern terminus of Oak Avenue to Grayson Avenue over Sulphur Creek	Feasibility study for pedestrian crossing	Crossing Improvements	$$

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 SH-C. For additional information on the application of these enhancements, refer to the Crosswalk Guidelines of this plan.

2. Source: Total Project Cost Estimate, St. Helena New Sidewalk Construction Project, ATP Cycle 2 Application Form, 2015

3. Based on cost of sidewalk

4. This crossing was identified as part of the pending General Plan update, public comment, and discussion with the city. Due to early planning stages, it was not included in the evaluation for prioritization.

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

Source: Fehr & Peers, 2015

Sidewalk gap closure projects are an important enhancement to pedestrian mobility. City staff identified sidewalk projects as a citywide need, especially south of the Sulphur Creek Bridge on Main Street, where facilities have maintenance needs. Several sidewalk gaps were identified during the public workshops and

discussions with city staff that are outside of the walking audits for this plan, including Grayson Avenue along the frontage of St. Helena High School and along Hudson Avenue. The city has approximately 29 miles of sidewalk gaps and filling these gaps is included as an on-going effort in Table SH-4, as adopted in the Countywide Transportation Plan (2015). Other pedestrian needs identified by staff for consideration for future walking audits include accommodations for recreational use along the railroad tracks and safety enhancements for seniors along Pope Street.

Supporting Programs and Policies

Key program and policy recommendations that complement the engineering-related projects are shown below in **Table SH-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 SH-6: ST HELENA PROGRAM AND POLICY RECOMMENDATIONS	
Program or Policy	**Recommendations**
Education and Encouragement	
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 Countywide Implementation chapter of the countywide plan.
Safety and Enforcement	
Law Enforcement for Pedestrian Safety	Coordinate with NVTA to provide resources to officers in St. Helena on pedestrian safety enforcement principles / best practices 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 *Countywide Implementation* 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.
Maintenance	
Repair of Sidewalks, Crosswalks, and Curb Ramps	• 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 above. This could include consideration of implementing an ADA Transition Plan and/or a trip and fall monitoring program. • 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 include the reporting of maintenance needs for pedestrian-related pavement markings and traffic control devices.
Overgrown Vegetation on Sidewalks and Planting Strips	• Continue to trim and maintain trees on Main Street, especially those at intersections to improve street light visibility. For specific locations where tree obstructions were observed during the walking audits, reference Improvement SH-2 in Appendix SH-C. • Citywide, ensure 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. Require adjacent property owners to maintain landscaped areas with live and healthy plant materials, replacing plant materials when necessary to maintain full function and aesthetics; to water, weed, prune, fertilize and keep sidewalks and planting strips litter free.
Caltrans Coordination	Sidewalk maintenance and curb ramp upgrades to directional through existing Caltrans right of way relinquishment for sidewalks (Charter Oak Avenue to Pratt Avenue). Coordinate with Caltrans on crosswalk enhancements along corridor and sidewalk improvements beyond existing right of way relinquishment.

TABLE SH-6: ST HELENA PROGRAM AND POLICY RECOMMENDATIONS	
Program or Policy	**Recommendations**
Engineering and Design Standards	
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.
Place Making and Complete Streets	
Downtown Parking Plan	Determine shared parking opportunities downtown to consider parklet in front of bakery on west side of Main Street and identify opportunities for bike parking to include bike corrals.
Site Plan Review Checklist	Create checklist for development review to ensure site plans include considerations for pedestrian access, safety, and sidewalk activation (i.e., considerations for building frontage location, pocket parks, small plazas or mini-shops, and pedestrian paths of travel through 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: http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf

Next Steps

Funding Sources

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 December 2015. 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 St. Helena through Caltrans, the Metropolitan Transportation Commission (MTC), and the Napa Valley Transportation Authority (NVTA).

According to St. Helena staff, sidewalks are included in the City's Capital Improvement Program and the city has budgeted approximately $17,000/year for the last three years for sidewalk repairs, although not all of it was spent.

Table SH-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 C** 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 SH-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. ● indicates 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 SH-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 SH-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 SH-5 to indicate an estimated range of cost level. Prepared cost estimates, included in **Appendix SH-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 SH-9** below.

TABLE SH-9: TIER ONE PROJECT SUMMARY COSTS	
Project	**Total Cost[1]**
SH-1: RLS Middle School Sidewalk and Hunt Avenue Improvements	$399,000
SH-2: Downtown Pedestrian Improvements (No. 35 CTP Project)	$1,355,900
SH-5: SHUSD Main Street Frontage Sidewalk	$184,300
SH-6: Downtown Operations Study	$53,000
SH-9: Main Street ADA Improvements	$137,700

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.

Note: For estimated costs for projects SH-3 and SH-4, refer to Napa Countywide Transportation Plan, Vision 2040 (2015).

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.

St. Helena Appendix

SH-A Benchmarking Table

SH-B Existing Pedestrian Policies

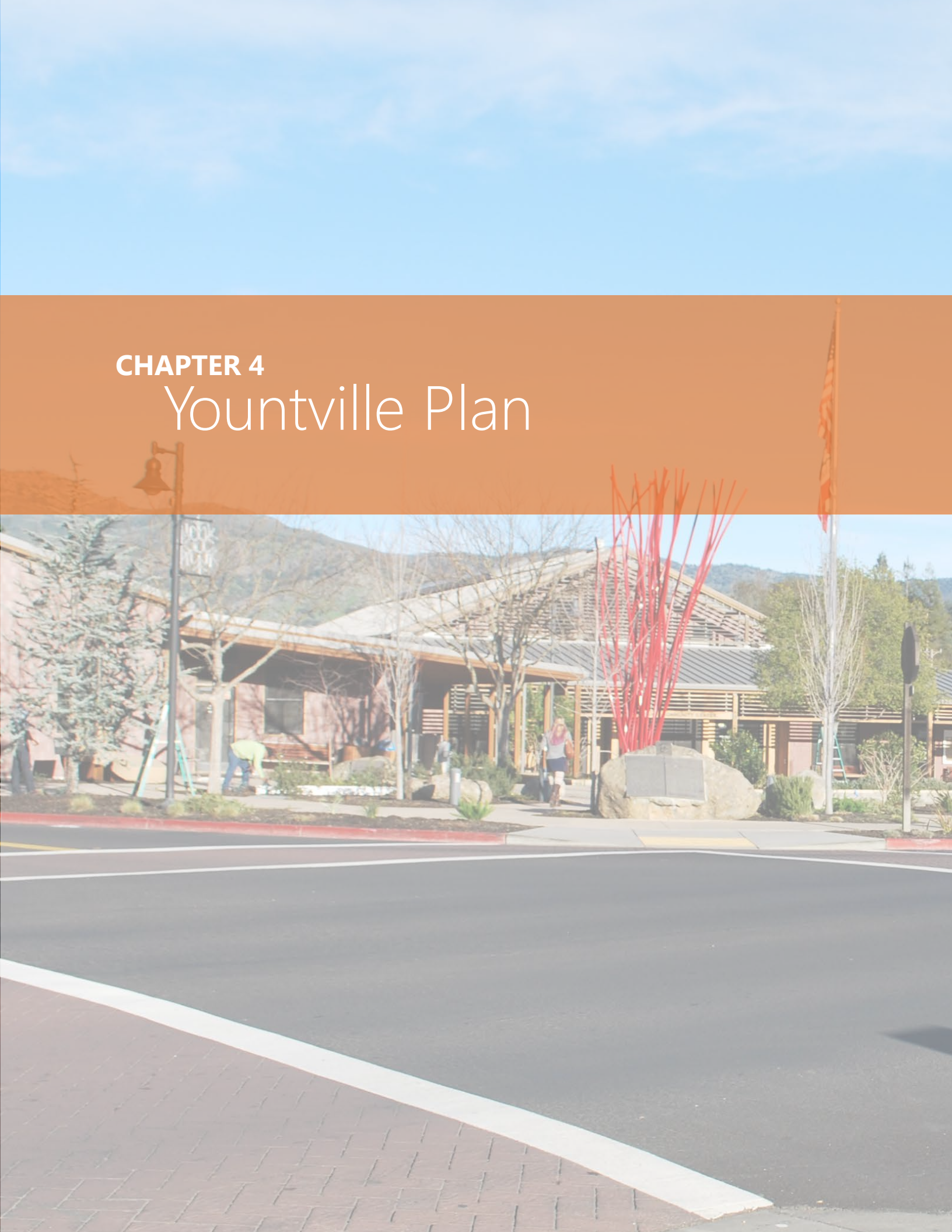
SH-C Detailed Project Lists and Prioritization

SH-D Cost Estimates

SH-E Plan Adoption Resolution

CHAPTER 4

Yountville Plan



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Chapter 4
Yountville Plan

Pedestrian Setting

Yountville is a small, walkable town with approximately 3,000 residents, where visitors are drawn to the esteemed dining and premium hotels and inns. Historic buildings dating back to the late 1800s are home to a collection of shops and restaurants, and art installations spill onto the downtown streets. This setting makes for an interesting and pleasant walking experience. While the majority of streets in the town center have sidewalks or asphalt pathways, one neighborhood includes gravel shoulders or no sidewalks to maintain the "old town" character, an important community value. The Town is located in central Napa County, approximately 7 miles north of the City of Napa along SR 29. Unlike other cities in Napa County, there are no state highways that overlap with local roadways in the town of Yountville, creating a much different experience for pedestrians. Land use patterns for the town are shown in *Exhibit Y-1* and a town destination map, including the locations of public buildings, shopping and tourist attractions, is shown in *Exhibit Y-2*.

Existing Policies and Programs

To help guide the development of key programs and policies for this plan, Yountville'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)

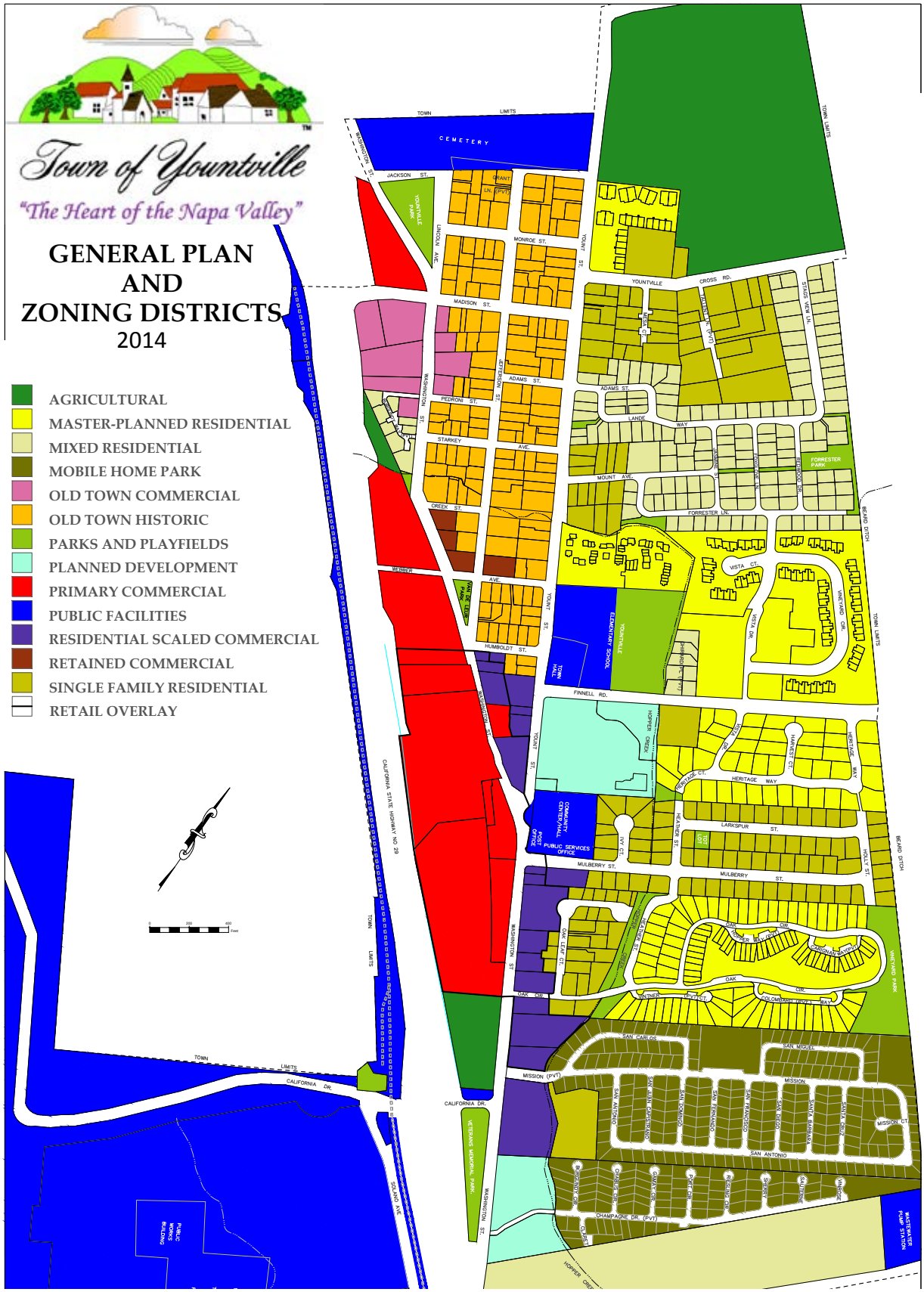
The Town of Yountville has made significant efforts to create a pedestrian-friendly community and excels in such areas as collision reporting, public involvement, design and development standards, and historical preservation. This plan will provide pedestrian volumes, conduct walking audits, and provide a framework for additional investments in order to create an accessible, connected pedestrian network throughout the town. Select key strengths and key opportunities from the benchmarking interview are highlighted below in **Table Y-1.** The full benchmarking analysis for Yountville, with associated recommendations, is presented in **Appendix Y-A**.

TABLE Y-1: YOUNTVILLE BENCHMARKING HIGHLIGHTS

Plans, Policies, & Programs	Yountville Current Practice	Best Practice Examples
Key Strengths		
Collision Reporting 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).	Yountville has a GIS program in place that is funded, and the Town generates quarterly collision reports which are reviewed with Council. According to town staff, this has proved sufficient for monitoring collisions.	
Public Involvement 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.	The Town of Yountville recently developed an online community engagement platform called Speak Up Yountville, a forum for the public to post ideas and provide feedback as well as comment on specific items or legislation on the agenda for upcoming public meetings.	• Add a page to Speak Up Yountville 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.

TABLE Y-1: YOUNTVILLE BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Yountville Current Practice**	**Best Practice Examples**
Design and Development Standards Design policies and development standards can improve the pedestrian walking experience, encourage walking, enhance economic vitality, and offer funding opportunities for pedestrian improvements.	Public Works standards include sidewalks on both sides of commercial and residential streets (excluding the Historic Old Town Neighborhood). The Yountville Bike Plan provides design guidelines for the path along Hopper Creek and the municipal code includes policies to provide new segments of the path. Additional policies in the municipal code include requiring active uses along Washington Street core business area, enhancing pedestrian activity and interest as well as locating parking behind commercial buildings to preserve the street frontage. Pedestrian-oriented design standards are provided in the municipal code for the Old Town Commercial District and include guidance for building façades and setbacks, pedestrian amenities like street furniture and public art, pedestrian-scaled signage, and pedestrian pathways. These design standards also play an important role in the Primary Commercial and Residential Scaled Commercial zoning districts.	• Incorporate elements of the Best Practices Toolkit, presented in **Appendix D** of the Countywide Pedestrian Plan as part of the development review process and to existing facilities when possible.
Historical Preservation Historic walking routes, such as the famous Freedom Trail in Boston, encourage walking and enhance economic vitality.	The Town of Yountville has several properties identified in the California Register, a master list of State historical resources. There are also several properties listed on the National Register of Historic Places. The Old Town Commercial District was created to maintain the historic character of Yountville and encourage pedestrian-oriented design. Wayfinding signs are posted in the area, which direct pedestrians to key destinations. The Yountville Chamber of Commerce provides Historical Walking Tour & Pathway Maps to the public. In addition, the Historic Walking Tour and Public Art Tour are posted online and on the town's app.	

TABLE Y-1: YOUNTVILLE BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Yountville Current Practice**	**Best Practice Examples**
Key Opportunities		
Pedestrian Volumes Pedestrian volume data is important for prioritizing projects, developing collision rates, and determining appropriate pedestrian infrastructure.	Yountville does not routinely collect pedestrian volumes, and they are not typically collected for traffic studies.	• Use collected volumes in this plan to monitor volume levels. • Routinely collect and geocode pedestrian and bicycle volumes by requiring them to be conducted in conjunction with all traffic studies and manual intersection turning movement counts.
Walking Audit Program 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. They can be led by Town staff, advocacy groups, neighborhood groups, or consultants.	Yountville has not conducted comprehensive pedestrian walking audits before this plan although annual sidewalk audits are completed as part of the Town's sidewalk inspection program to evaluate the need for maintenance or expansion. Tripping hazards are documented within the town's GIS database. Town staff walks the roadways daily and notes potential hazards or opportunities for improvement.	• Expand the town's sidewalk inspection program to include walking audits that document existing staff recommendations and evaluate the need for additional features at mid-block crossing locations, existing desire lines, and desired traffic calming, similar to the initial round of walking audits completed with this plan.



Source: Yountville General Plan and Zoning Districts, 2014.

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Exhibit Y-1

Yountville - Land Use Map

Source: Hotel Youtville, Yountville Dining and Wine Tasting Map.

Exhibit Y-2

Yountville - Destination Map

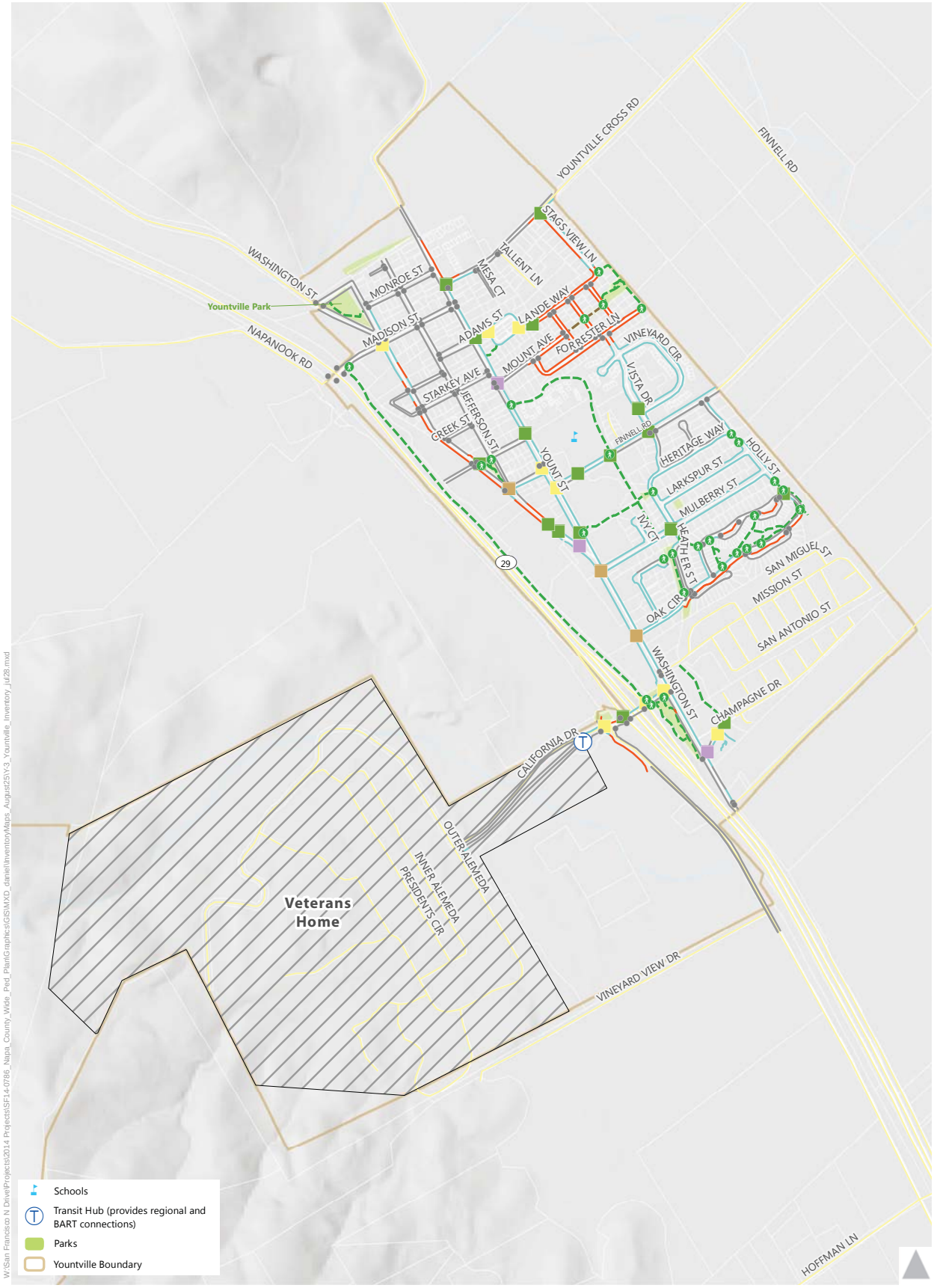
Existing Pedestrian Infrastructure

An inventory of existing sidewalks, marked crosswalks, curb ramps and trails was collected on key roadways throughout the Town 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).

Yountville Inventory

Pedestrian facilities were inventoried for the entire roadway network in Yountville. As shown in Exhibit Y-3, the town has a well-established network of pedestrian pathways and cut-throughs that connect the adjoining neighborhoods. While Exhibit *Y-3* shows a lack of sidewalks along streets in the north of town (Old Town), these locations have gravel shoulders which are used in Yountville to preserve the rural character and were not captured as a sidewalk type in the countywide inventory methodology. Roadways that have these gravel pathways include sections of Madison Street, Starkey Avenue, and Monroe Street that abut Old Town. Town staff identified the need for pedestrian facilities along Yountville Cross Road, shown on Exhibit Y-3 as lacking sidewalk and curb ramps between Stags View Lane and Yount Street, along with the desire to complete pedestrian connections to Yountville Park.



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Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4

- Missing Curb Ramp
- Trail Crossings
- Roads not Surveyed

Exhibit Y-3
Pedestrian Facility Inventory
Town of Yountville

Activity Levels

Pedestrian counts were conducted at five locations throughout Yountville 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 levels of walking, and proximity to key pedestrian destinations, including schools and downtown commercial areas. **Table Y-2** provides a summary of the two-hour counts completed within the town. Count results varied significantly based on population density of a given neighborhood, as well as by the adjacent land use.

TABLE Y-2: YOUNTVILLE COUNT PROGRAM LOCATIONS

ID	Jurisdiction	Location	Morning	Evening	School	Weekend
			7-9AM	4-6PM	2-4PM	12-2PM
YT1	Yountville	Madison Street and Washington Street	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 Road	95	94	72	

The highest rates of walking in Yountville during all time periods were observed at the intersection of Washington Street and Yount Street in downtown Yountville. This location is in close proximity to several shops and restaurants, and is currently an all-way stop controlled intersection with marked crosswalks across all of the intersection's legs. The highest observed pedestrian activity at this location was midday (12-2 PM) on Saturday, when nearly 800 crossings took place during the two-hour count period. Pedestrians were also counted at the downtown intersection of Madison Street and Washington Street, where an average of 87 crossings were observed.

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 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.

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).

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 Y-4 shows the locations of these pedestrian collisions in Yountville.

Exhibit Y-4 presents raw collision counts only. While this is illustrative of "hot spot" areas in Yountville, 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 Town-wide) 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

All reported pedestrian-involved collisions in Yountville were along or near Washington Street south of the "Y" of Yountville, the intersection of Yount Street and Washington Street, where the majority of vehicles enter the Town from SR 29. While most locations in Yountville only had one reported collision occurrence if any, the intersection of Washington Street and Oak Circle had two reported collisions. The town did not have any pedestrian fatalities over the last ten years.

Countywide Demographic and Seasonal Trends

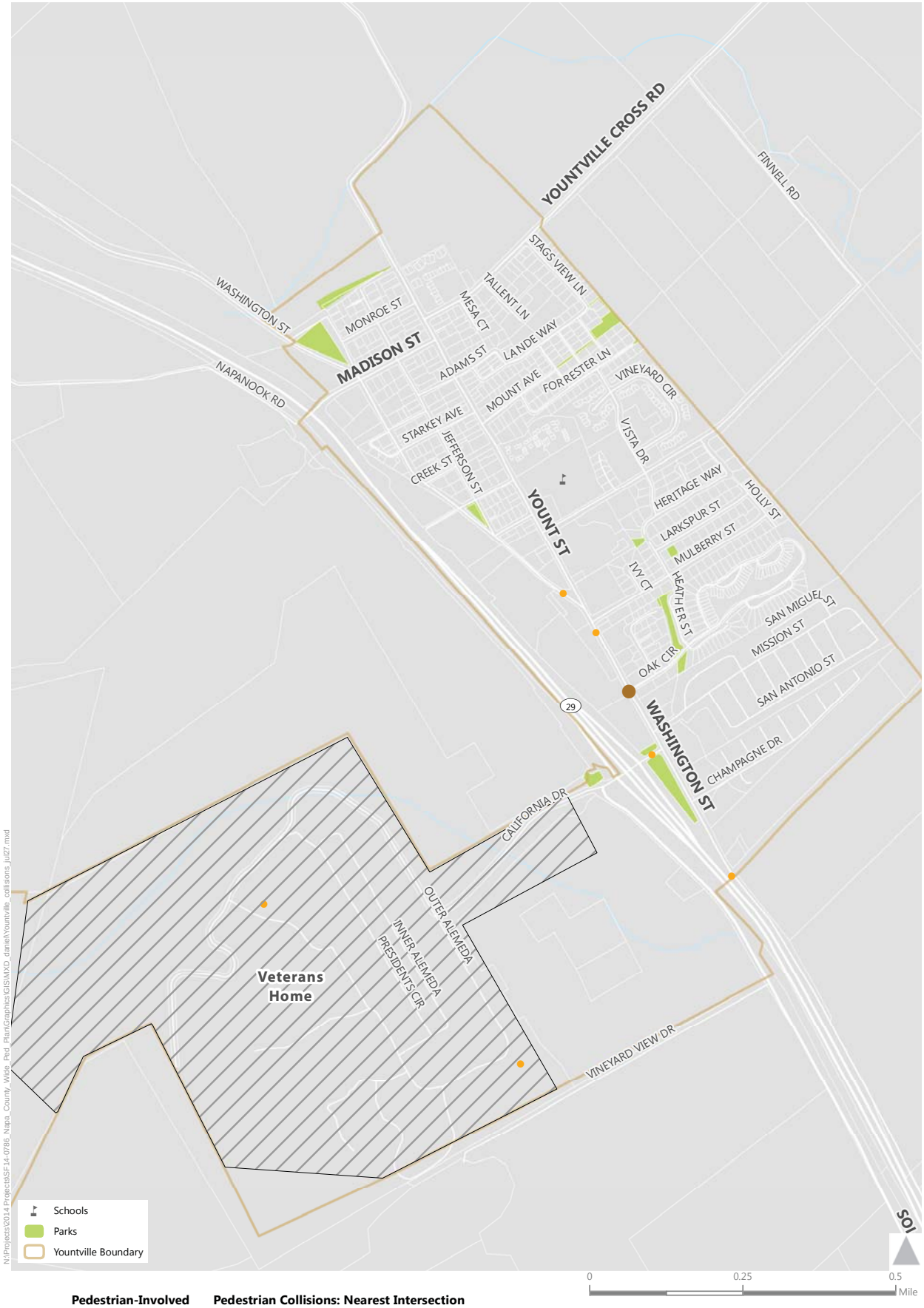
For this plan, a review of collisions countywide included organizing the data by age for children and seniors, and comparing the results across each jurisdiction. Daily and seasonal trends for collision occurrences and primary collision factors were also reviewed countywide. A summary of these results can be found in the *Countywide Walking Trends* section 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. **Table Y-3** shows the recorded pedestrian actions that occurred before collisions in Yountville, indicating that collisions are typically focused on locations where pedestrians are walking along the roadway.

TABLE Y-3: YOUNTVILLE COLLISION SUMMARY PEDESTRIAN ACTIONS (2003-2012)			
Pedestrian Action	Number of Collisions		
	Injury	Fatality	Total
Walking, Not in Road	3	0	3
Walking In Road, Including Shoulder	2	0	2
Crossing in Crosswalk, Not at Intersection	1	0	1
Crossing Not in Crosswalk	1	0	1
Not Stated	1	0	1

Source: SWITRS



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Pedestrian-Involved Collisions 2003-2012

- 1
- 2

Pedestrian Collisions: Nearest Intersection

Density	Intersection	Total Collisions
●	Presidents Cir. and Outer Alameda	1
●	Washington St. and Yount St.	1
●	California Dr. and Washington St.	1
●	Washington St. and Mulberry St.	1
●	Presidents Cir. and California Dr.	1
●	Washington St. and Land Ln.	1
●	Washington St. and Oak Cir.	2

None of these intersections experienced a fatal collision.

Exhibit Y-4
Pedestrian-Involved Collisions
2003 - 2012 Town of Yountville

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 Y-4**. Connectivity and safety were the key themes across the countywide comments.

TABLE Y-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 "other" in Yountville 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.

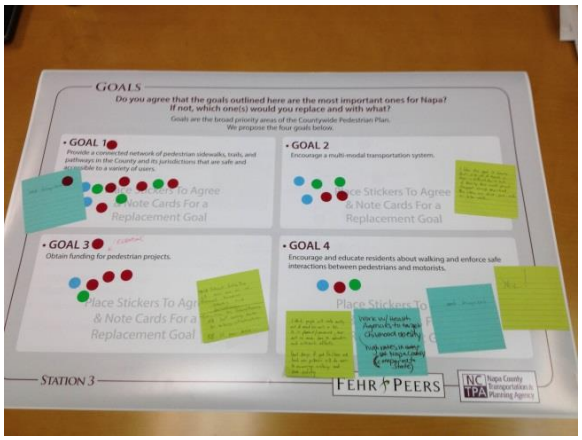
Public workshops were held throughout the County in Winter 2015: in Napa on January 22 at NVTA; in Yountville on January 27; in St. Helena on January 28; and in American Canyon on February 4. Due to recent public workshops held in Calistoga through development of their Active Transportation Plan in 2014, 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**

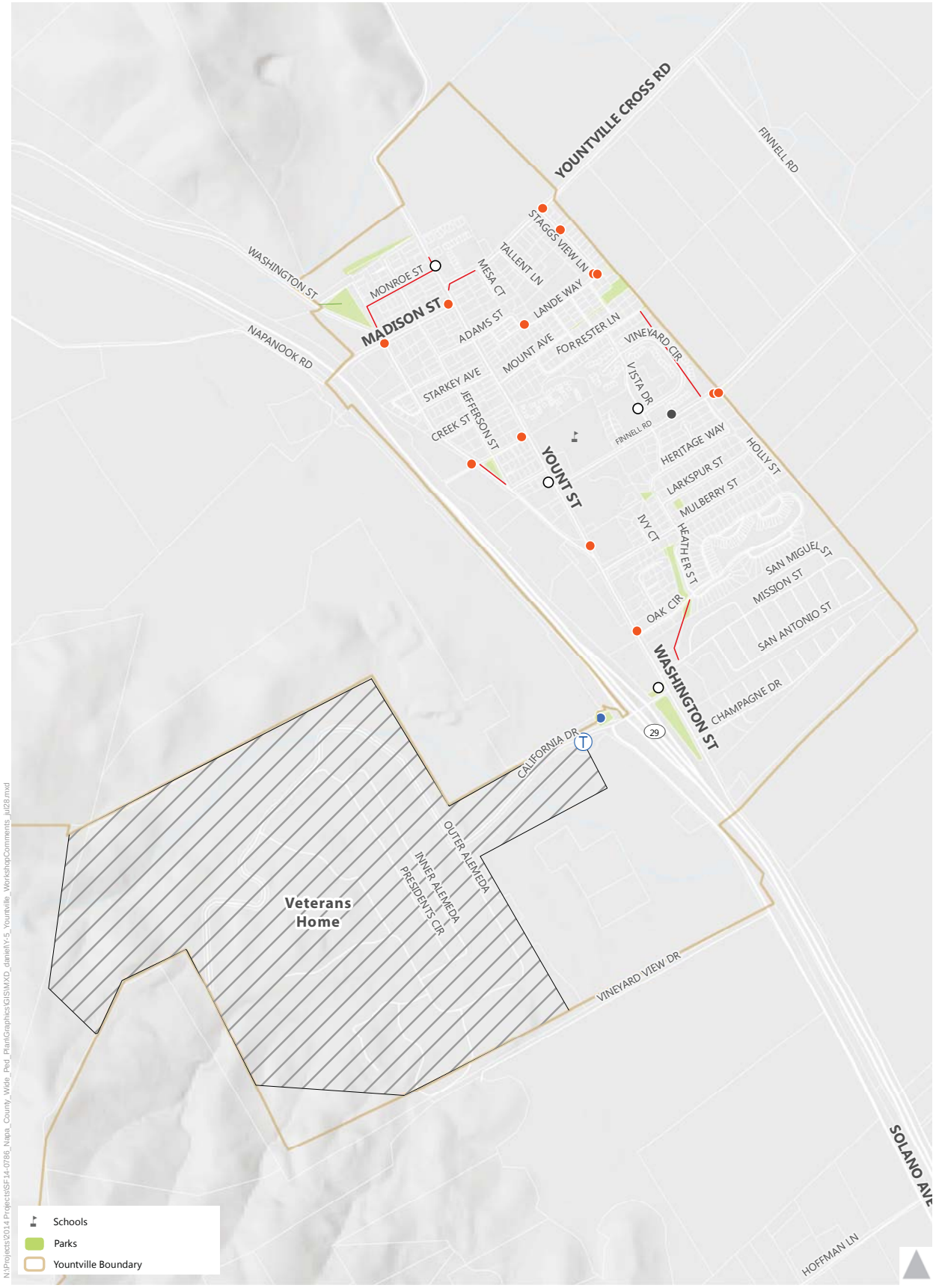
  At Station One, participants voted on a list of common barriers to walking to indicate which issues were most relevant to the walking environment in their jurisdiction and countywide. Participants also wrote comments on large-scale aerial maps placed on tables or on the floor to highlight existing barriers 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 39 comments in the Town of Yountville, shown in *Exhibit Y-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 Y-4. Examples of these miscellaneous comments included documentation of pedestrian routes used by the 7th Day Adventist community, suggestions for aesthetic treatments to downtown crosswalks, and recommendation for a pedestrian bridge crossing the creek on Jefferson Street. 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.
- **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.



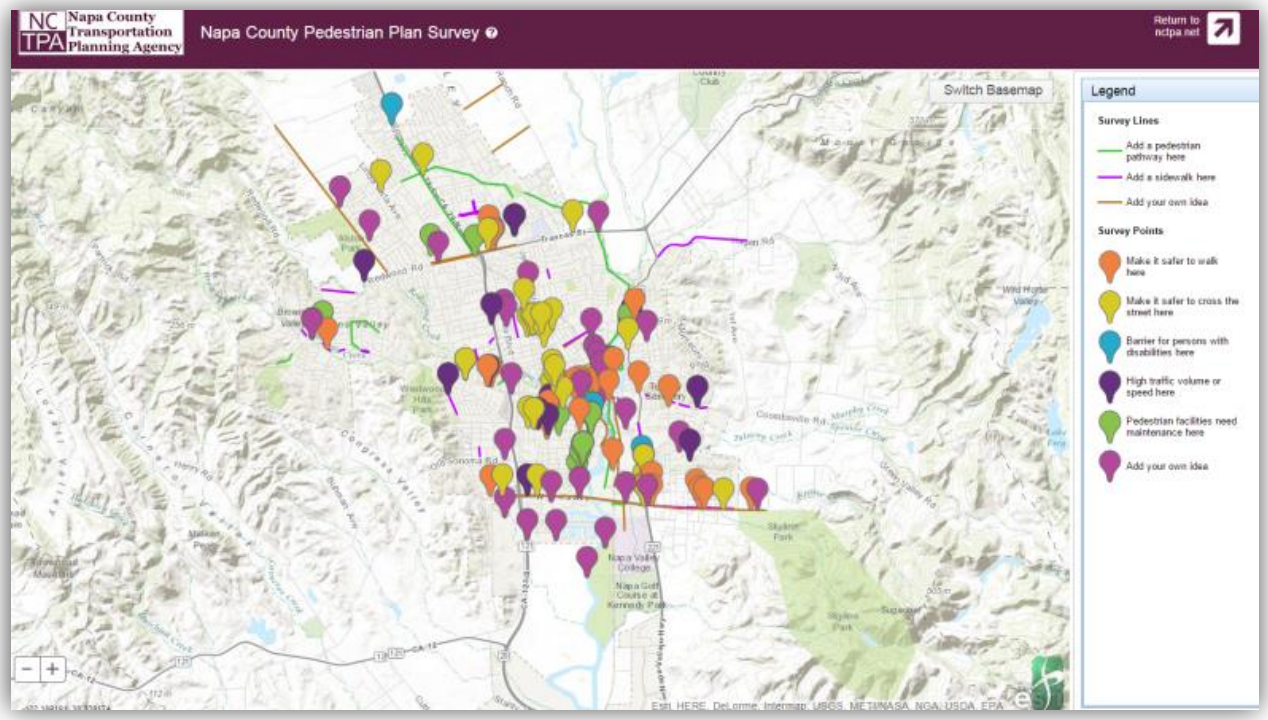
Safety
Maintenance
ADA
Other
Sidewalk/Pathway
Other

Exhibit Y-5
Workshop Comments
Town of Yountville

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.

Yountville-Specific Focus Groups

At the outset of the plan development process, meetings were held with key staff from Yountville to initiate the planning process on December 9, 2014.

This meeting included a discussion of existing programs, policies and practices. Recommendations for improvements are provided in the benchmarking summary table in **Appendix Y-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 Yountville staff and included conducting pedestrian counts, coordinating efforts with the Town ADA Transition Plan, and preserving the rural character. These goals are incorporated into key programmatic and policy recommendations in this plan.

Additional focus group meetings were held for the Yountville walking audit on May 11, 2015, and to review the list of suggested pedestrian projects on August 12, 2015.

Perceived Barriers

As shown in **Table Y-4**, connectivity and safety are two of the top pedestrian issues identified from the public. To geographically visualize the safety concerns in Yountville, a heat map was created, shown in Exhibit Y-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[4] or fewer people walking as a result of the 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.

[4] 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

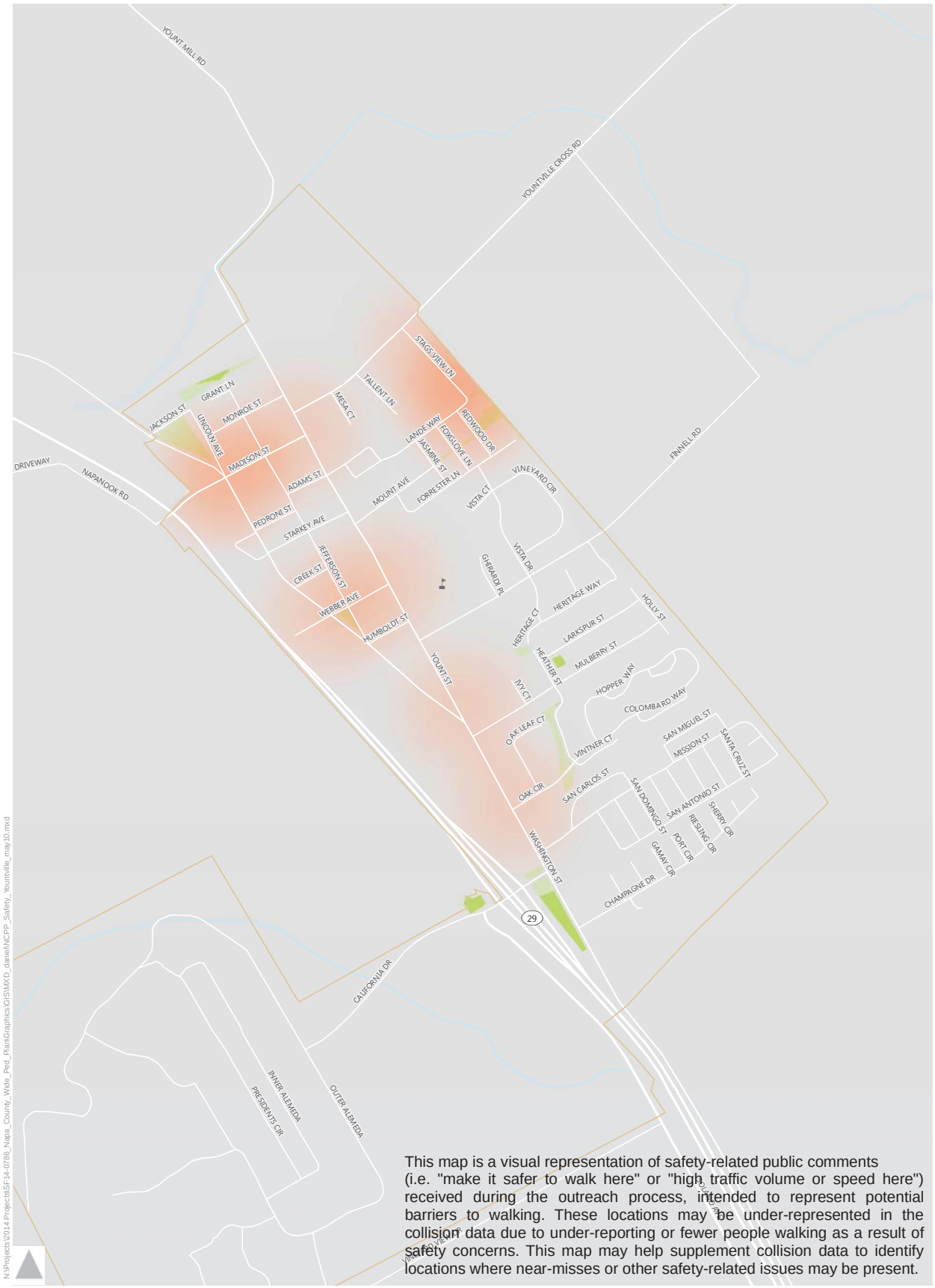


Exhibit Y-6
Perceived Barriers: As Visualized by Safety-Related Public Comments
Town of Yountville

Opportunity Areas

Yountville's small-town layout, historic charm, numerous dining and shopping attractions, and network of neighborhood pathways create a well-connected and enjoyable environment for pedestrians. The town is also focused on implementing their ADA Transition Plan, and has recognized this moment as a key opportunity to enhance pedestrian safety and mobility in concert with the accessibility updates. This plan expands on those efforts by developing a list of proposed pedestrian facilities within key focus areas of the town 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 Town of Yountville. 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 Yountville, 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 Y-7*.

As illustrated on *Exhibit Y-7*, Ped INDEX focus locations include the downtown core and neighborhood pockets near Mulberry Street and Forrester Lane. After reviewing the locations of comments received during public outreach and the alignment with focus locations on the Ped INDEX maps, three potential walking audit were recommended for consideration to town staff:

- **Town Entrances**: Finnell Road from Yount Street to town boundary; Yountville Cross Road from Yount Street to town boundary; Stags View Lane from Yountville Cross Road to Lande Way (.7 miles)
  Both Finnell Road and Younville Cross Road are key entrances to the town from the unincorporated areas. Several comments from the town staff and the public highlight concerns of speeding along these roadways and the need for traffic calming and pedestrian facilities. Many comments during the public workshop were centered around the residents of the 7th Day Adventist Community, who frequently walk along Finnell Road, highlighting the need for sidewalk maintenance along the roadway adjacent to the

community. This focus area also includes children walking to Yountville Elementary School, consideration of a pathway north of Heritage Way, and parking conflicts on Stags View Lane.

- **North-South Corridors:** Washington Street from Humboldt to Madison; Yount Street from Madison to Oak Circle (1.1 miles)
  This focus area addresses comments from both town staff and the public about the desire for pedestrian accommodations at the south end of Yountville Park and the diagonal desire lines at the intersection of Madison Street and Washington Street, a five-legged intersection. Several other comments were made during the public workshop requesting improved crossings at the intersections of Washington Street at Webber Avenue, Madison Street at Yount Street, and Yount Street at Webber Avenue. This focus area also includes a potential need for crosswalk enhancements at Yount Street and Oak Circle, and the block between Mulberry Street and Oak Circle, where 3 pedestrian collisions have occurred in the last 10 years and the public voiced concerns about stop sign violations.
- **Jefferson Street:** Jefferson Street from Humboldt to Monroe (.4 miles)
  This focus area includes the Hopper Creek Bridge and a corridor with limited pedestrian facilities.

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

- Washington Street, from Oak Circle to Madison Street
- Yountville Cross Road, from Yount Street to eastern town boundary
- Finnell Road, from Yount Street to eastern town boundary

Demand:

Pedestrian Index Score

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1 2

Pedestrian Fatality

Missing Sidewalks

Legend:

Downtown Core (Retail Overlay)

Parks

School

Trail/Path

Exhibit Y-7

Yountville - Pedestrian Index Demand & Deficiencies

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 the Yountville Public Works Director, Joe Tagliaboschi, 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 Y-8*. Descriptions of each project and additional program and policy recommendations are included below under *Priority Projects.*

Exhibit Y-8

Yountville - Project Locations

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. Using consistent prioritization criteria countywide, this plan includes a tiered list of projects for Yountville reflecting:

- 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 Y-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 Y-C.** A summary of the improvements is shown in **Table Y-5**.

Funded or Constructed Projects

The Town of Yountville and private property owners have completed several recent projects in 2015 to improve pedestrian mobility, including replacing an asphalt pathway with concrete sidewalk near Van De Leur Park and adding a marked crosswalk to connect to the park across Washington Street. In-roadway signs at uncontrolled locations townwide were recently updated to the California standard of “Yield to Pedestrians” as well. In addition, the town has secured funding for several sidewalk and crosswalk projects scheduled to be constructed in the near future. These recently completed and funded projects were assigned to “Tier Zero” in **Table Y-5** and were not evaluated for prioritization.

TABLE Y-5: YOUNTVILLE PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
ON-GOING SYSTEM MAINTENANCE				
Sidewalk Gap Closure and Maintenance (No. 32 2015 CTP Program)	Townwide	Sidewalk maintenance, rehabilitation and expansion	Sidewalks Maintenance	$$$
TIER ZERO (FUNDED OR CONSTRUCTED PROJECTS)				
T0-1[1] RH Gallery Funded Improvements	Washington Street at Pedroni Street	Sidewalk and crosswalk enhancements2; bus stop relocation	Sidewalk Crossing treatments	--
T0-2 Washington / Webber Intersection Improvements	Washington Street at Webber Avenue	Sidewalk, crosswalk enhancements2	Sidewalk Crossing treatments ADA Ramps	--
T0-3 Finnell Road Improvements	Finnell Road, Vista Drive to Heritage Way	Sidewalk	Sidewalk	--
	Finnell Road, Heritage Way to Yount Street	Class II bike lanes	Bicycle treatments	--
	Finnell Road at Heritage Way	Marked crosswalk with MUTCD signage	Crossing treatments	--
	Finnell Road at Vista Drive	Marked crosswalks	Crossing treatments	--
	Finnell Road at Town Limits	Speed bump	Traffic Calming	--
T0-4 Yountville Park ADA Improvements	Yountville Park	Accessibility upgrades	ADA	--
T0-5 Yountville Crossroads Complete Streets Project (No. 54 on Constrained CTP Project List)	Yountville Cross Road, Yount Street to Stags View Lane	Sidewalk and sharrow markings	Sidewalks	--
		Walk Audit Recommendations	Pathway Wayfinding	--
		Wayfinding study and striping enhancements		

TABLE Y-5: YOUNTVILLE PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
T0-6 Vine Trail Improvements		**Walk Audit Recommendations**		
	Washington street at Madison Street	Wayfinding	Wayfinding	--
	California Drive at SR 29 northbound ramps			
	Washington Street at Webber Avenue	Wayfinding Marked crosswalk	Wayfinding Crossing treatments	
T0-7 Townwide Crosswalk Signage	Townwide	**Walk Audit Recommendations**	Crossing treatments	--
		In-roadway signs at uncontrolled locations changed to "Yield to Pedestrians" instead of "Stop for Pedestrians"		
TIER ONE				
Y-1 Washington Park ADA Improvement Project (No. 53 on Constrained CTP Project List)	Washington Park Subdivsion	Improve the paved shoulders to be more accessible for pedestrians	ADA	$850,000[4]
Y-2 Yountville Park Improvements	Washington Street at Lincoln Avenue	Near Term: Restriping intersection for realignment and traffic calming; marked crosswalk	Traffic Calming Crossing Treatments	$65,300
		Long Term: Feasibility study for formalizing realignment with curb extensions or roundabout		$50,000
Y-3 Washington Intersection Improvements	Washington Street at Humboldt Street	Striped bus platform for vehicle channelization	Traffic Calming	$25,000
	Washington Street at Yount Street	Review for potential pedestrian enhancements	Crossing treatments	
	Washington Street at Mulberry Street	Stamped crosswalk		
	Washington Street at Oak Circle	Review for potential pedestrian enhancements		

TABLE Y-5: YOUNTVILLE PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
TIER TWO				
Y-4 Business Frontage Improvements[3]	Washington Street at Creek Street	Marked crosswalk with crosswalk enhancements2	Crossing treatments	$$
	Washington Street; Humboldt Street to Buchon Bakery	Review for potential pedestrian enhancements	Crossing treatments	
	Hope and Grace Winery	Review for potential pedestrian enhancements	Wayfinding	
	Washington Street at Vintage Estate Parking Access	Review for potential pedestrian enhancements	Sidewalk Crossing treatments	
	Ranch Market Too	Review for potential pedestrian enhancements	Crossing treatments	
Y-5 Finnell Road Intersection Improvements	Finnell Road at Yount Street	Review for potential pedestrian enhancements	Crossing treatments	$
	Finnell Road at Yountville Town Hall			
	Finnell Road at Vista Drive			
Y-6 Madison Street Wayfinding	Madison Street; Washington Street to Yount Street	Wayfinding and enhanced walkway	Wayfinding Enhanced Walkway	$

1. Project is expected to be completed by the summer of 2016

2. 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 Guidelines in Appendix D of the Countywide Pedestrian Plan.

3. Elements of these improvements are located on private property and would be completed by business owners rather than the Town.

4. Source: Napa Countywide Transportation Plan, 2015

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

Source: Fehr & Peers, 2016

Preserving the rural character is an important value to the community and a key consideration in the design of pedestrian infrastructure, especially when considering alternatives to sidewalk installation. Several roadways in Yountville were identified during the walking audits as potential candidates for in-street walkways where sidewalks may be infeasible due to engineering constraints or community values. This low cost improvement could include a combination of striping, pavement markings, and signage to designate an existing shoulder or bike lane as a shared space for bicyclists and pedestrians. Additional design guidance is provided in the Best Practices Toolkit (**Appendix D** of the Countywide Pedestrian Plan) under *Enhanced Walkways*. Variations of this treatment

could be used as an interim or near term improvement while funding is secured for sidewalks, such as on Yountville Cross Road. Specific locations where this treatment could apply are Yountville Cross Road and Madison Street, as shown in Improvement Y-2 and Y-9.

Supporting Programs and Policies

Key program and policy recommendations that complement the engineering-related projects are shown below in **Table Y-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 Y-6: YOUNTVILLE PROGRAM AND POLICY RECOMMENDATIONS	
Program or Policy	**Recommendations**
Education and Encouragement	
Safe Routes to School (SRTS) Coordination	Coordinate with the Napa County Office of Education to continue SRTS programs in the Town, and determine feasibility of implementing recommendations under the Safe Routes to School Support Program in the *Countywide Implementation* chapter of the countywide plan.
Safety and Enforcement	
Law Enforcement for Pedestrian Safety	Encourage coordination with law enforcement on pedestrian safety. 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 *Countywide Implementation* 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.
Maintenance	
Repair of Sidewalks, Crosswalks, and Curb Ramps	• Continue to regularly improve and repair uneven sidewalk, broken asphalt in crosswalks, and install new curb ramps as part of the Townwide Sidewalk Maintenance Program above. This could include efforts as part of the Town's ADA Transition Plan and/or the sidewalk monitoring program. • Determine feasibility of adding a page to Speak Up Yountville 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 Town's Capital Improvement Program (CIP). This could include the reporting of maintenance needs for pedestrian-related pavement markings and traffic control devices.
Overgrown Vegetation on Sidewalks and Planting Strips	Continue to ensure townwide that landscapes at maturity do not interfere with safe sight distances for 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. Require adjacent property owners to maintain landscaped areas with live and healthy plant materials, replacing plant materials when necessary to maintain full function and aesthetics; to water, weed, prune, fertilize and keep sidewalks and planting strips litter free. Specific locations for implementation include: • Hedge trimming for wheelchair visibility at marked crosswalk on Vista Drive at Vineyard Circle • Vegetation trimming along north side of Yountville Cross Road east of Mesa Court
Engineering and Design Standards	
Crosswalk Guidelines	Implement Crosswalk Guidelines, included in Appendix D of the Countywide Pedestrian Plan, to enable the Town 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.

TABLE Y-6: YOUNTVILLE PROGRAM AND POLICY RECOMMENDATIONS	
Program or Policy	**Recommendations**
Place Making and Complete Streets	
Parking Plan	Consider long term options for shared parking to allow for flexibility to repurpose parking through the town for such improvements as curb extensions, midblock crosswalks, etc. Consider red curb to prevent parking on sidewalk along Forrester Lane to maintain connection to neighborhood trail entrance.
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: http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf

Next Steps

Funding Sources

Yountville is uniquely positioned to invest in community development projects through robust local revenues and pays for the majority of pedestrian improvements with General Fund monies. Pedestrian-related expenditures in Yountville since 2010 have totaled $1,500,000.

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 December 2015. 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 Yountville through Caltrans, the Metropolitan Transportation Commission (MTC), and the Napa Valley Transportation Authority (NVTA).

Table Y-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 C** 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 Y-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. ● indicates 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 Y-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 Y-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 Y-5 to indicate an estimated range of cost level. Prepared cost estimates, included in **Appendix Y-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 Y-9** below.

TABLE Y-9: TIER ONE PROJECT SUMMARY COSTS	
Project	**Total Cost[1]**
Y-1: Washington Park ADA Improvement Project (No. 53 CTP Project)	$850,000
Y-2: Yountville Park Improvements	-
Near Term	**$65,300**
Long Term	**$115,300**
Y-3: Washington Intersection Improvements	$25,000

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.

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.

Yountville Appendix

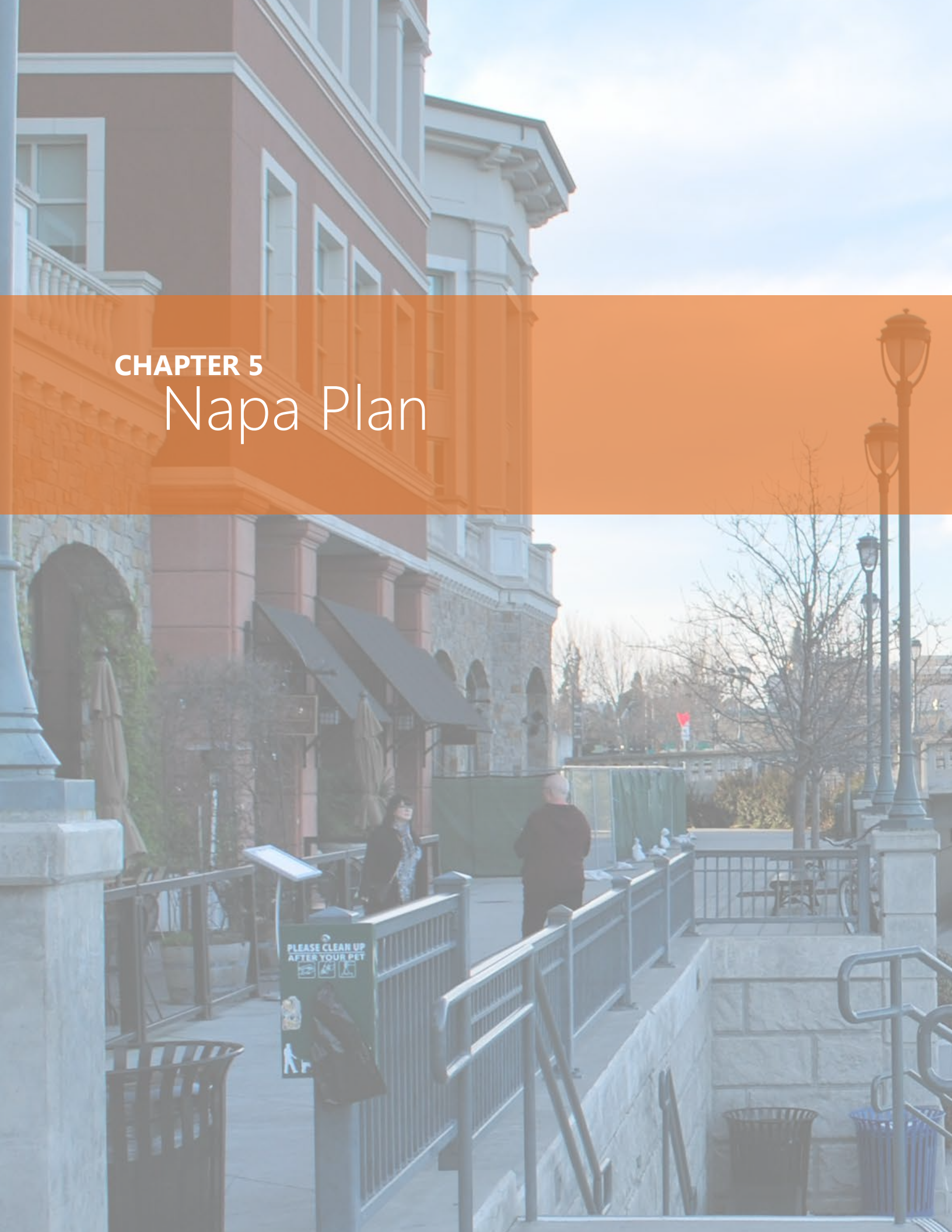
Y-A Benchmarking Table

Y-B Existing Pedestrian Policies

Y-C Detailed Project Lists and Prioritization

Y-D Cost Estimates

Y-E Plan Adoption Resolution



CHAPTER 5

Napa Plan

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Chapter 5

Napa Plan

Pedestrian Setting

Napa is a suburban community in the heart of Napa County with approximately 79,000 residents. The city attracts year-round visitors with its flourishing vineyards, reputable restaurants, and beautiful Napa Riverfront. The city's downtown is an active pedestrian center, with a traditional grid network and attractive building facades that honor the region's history, making pedestrian trips efficient and enjoyable. Several pathways along the Napa River have recently been completed with plans to develop additional connections. Outside of downtown, roadways are often designed to carry high vehicle volumes, which can result in higher speeds along four-lane roadways that are difficult to cross. The planning areas for the city and associated development potential are shown in *Exhibit N-1* and a downtown destination map, including the locations of public buildings, parks, and community amenities, is shown in *Exhibit N-2*.

Existing Policies and Programs

To help guide the development of key programs and policies for this plan, Napa'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)

The City of Napa has robust design guidelines for creating a pedestrian-oriented environment in the downtown core through the adoption of the Napa Downtown Specific Plan, and this plan will provide a framework for expanding policies in the General Plan, ADA Transition Plan, public works standards, and city municipal code as well as future investments to create a safe and continuous pedestrian network citywide. The city also has exceled at pedestrian inventory collection and adoption of a pedestrian-friendly street tree ordinance. As summarized in **Table N-1**, potential areas of opportunity that this plan addresses include collision reporting, coordination with transit providers, and Napa-specific crosswalk design guidelines. The full benchmarking analysis for Napa, with associated best practice examples, is presented in **Appendix N-A**.

Downtown Napa: Riverfront Promenade

TABLE N-1: NAPA BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Napa Current Practice**	**Best Practice Examples**
Key Strengths		
Inventory of Pedestrian Facilities A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc.	The City is currently assembling a GIS-based inventory of existing or missing sidewalks and curb ramps through their Asset Management Plan, which is separate from the inventory collection process for this plan. Sidewalk projects are funded through the CIP and the sidewalk maintenance program, which has an annual funding level of approximately $1,500,000. This program includes maintaining curb ramps, repairing tree damage, and constructing missing sections of sidewalk. Additionally, the city coordinates efforts for the 10-mile repaving program with sidewalk repair projects to combine resources if possible. The city offers partial reimbursement of funds for repairs of displaced or damaged sidewalks to property owners through the Sidewalk Repair Program.	• Expanding the GIS sidewalk inventory to include informal pathways and key pedestrian opportunity areas in the city.
Design and Development Standards Design policies and development standards can improve the pedestrian walking experience, encourage walking, enhance economic vitality, and offer funding opportunities for pedestrian improvements.	The city has developed and adopted the 2012 Downtown Napa Specific Plan (DNSP), providing local design guidelines for walkability and pedestrian facilities. The DNSP also includes a proposed streetscape plan and typical cross-sections with minimum sidewalk widths for identified “Core Streets” and “Secondary Streets”. Zoning overlays govern the allowed Building Forms for development that continue to a “sense of place” in Downtown Napa The DNSP also recommends adopting a policy to balance the design requirements of delivery vehicles and pedestrians downtown by designating pedestrian-oriented streets and delivery vehicle-oriented streets with appropriate design guidelines for each. Pedestrian-friendly design is included in the development guidelines for the Soscol / Downtown Riverfront Design Guidelines, with a focus on human-scale design and streetscape improvements. The 2004 Residential Design Guidelines emphasize place making for infill neighborhoods in evolving areas and encourage new projects to consider pedestrian connections, avoid parking that separates the project from the street edge, include a streetscape plan, and fully integrate parks and community facilities.	• Consider a refresh of the Napa Residential Design Guidelines (2004) to determine their effectiveness to promote pedestrian-friendly neighborhoods and for consistency with the more recent Housing Element of 2015. • Following the DNSP guidelines for delivery vehicle-oriented streets and pedestrian-oriented streets when appropriate and consider designating streets downtown for the appropriate application.

TABLE N-1: NAPA BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Napa Current Practice**	**Best Practice Examples**
Street Tree Ordinance 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.	Napa has a street tree ordinance specifying the responsibility of maintenance of street trees and the permitting requirements for planting and removal of street trees. The Tree Advisory Committee maintains a tree species list that is approved to prevent root damage to sidewalks.	
Key Opportunities		
Collision Reporting 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).	The City of Napa reviews collision data, to help identify CIP projects and evaluate development in the area. Staff can run queries using the crossroads software as needed. The crossroads software allows for geo-coding (mapping) and comprehensive monitoring.	• Expanding monitoring practices to include collision typing for countermeasure selection could allow for more proactive pedestrian safety projects. 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.
Coordination with Emergency Response and Transit Providers 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.	Police and Fire Department staff is involved in the city's plan-check process. Transit agencies are a key stakeholder in pedestrian-related improvements since many transit riders walk to and from their destinations on either end of their transit trip. There is minimal coordination between transit planning and pedestrian planning in Napa, although the General Plan does include a policy to consider a Safe Routes to Transit Program.	• Seeking opportunities for technical collaboration and funding with first responders and transit providers. • Exploring ways to implement a Safe Routes to Transit Program that prioritizes bike and pedestrian access to major transit connection points and transit centers. In Napa, this would align with the General Plan and the Napa Bike Plan.
Crosswalk Design Guidelines A formal policy for crosswalk installation, removal, and enhancement provides transparency in decision-making and creates a consistent application of treatments citywide.	The city currently does not have a crosswalk policy, but design guidelines for enhanced crosswalks in downtown are included in the Downtown Napa Specific Plan., The city makes decisions regarding crosswalks on a case by case basis, and prefers crosswalks to be located at signalized crossings rather than mid-block. The city has removed mid-block crossings downtown and requires strong justification based on engineering evaluation for new mid-block crossings to be approved.	• Consider adopting a local crosswalk policy to include criteria for appropriate locations to install crosswalk enhancements such as flashing beacons or advanced yield markings. • Conducting audits of the adequacy of current crosswalks to address pedestrian safety, using nationally accepted best practices and recent research.

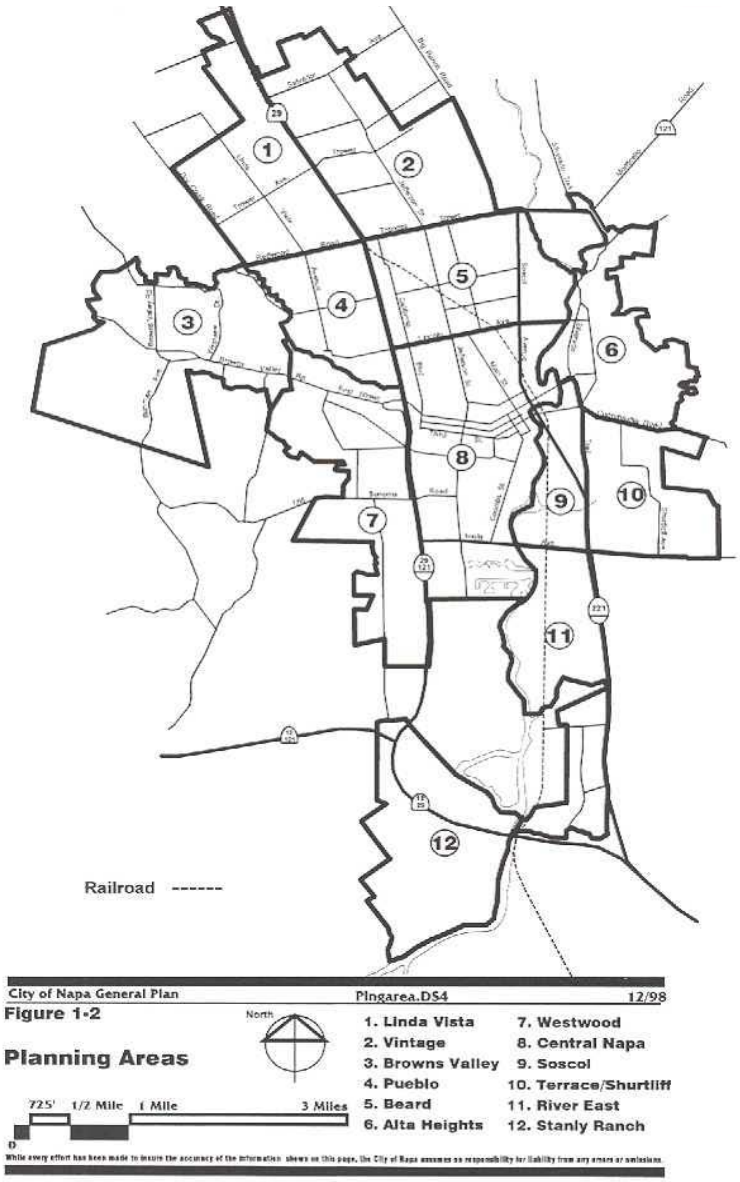

Table 1-2

SUMMARY OF DEVELOPMENT POTENTIAL BY PLANNING AREA

	Planning Area	Residential (Dwelling Units)		Commercial/Industrial (Sq. Ft.)	
		Existing*	Additional	Existing*	Additional
1	Linda Vista	2,752	1,277	247,365	111,524
2	Vintage	3,189	1,611	555,629	157,494
3	Browns Valley	2,329	609	27,425	8,584
4	Pueblo	2,157	212	96,935	36,402
5	Beard	3,884	623	1,050,914	322,523
6	Alta Heights	1,406	296	14,405	16,345
7	Westwood	3,301	927	392,869	273,465
8	Central Napa	5,765	844	2,997,572	681,579
9	Soscol	121	108	625,142	387,208
10	Terrace/Shurtleff	2,193	733	103,319	52,736
11	River East	0	0	892,641	1,014,794
12	Stanly Ranch	1	600	0	109,314
Total		27,098	7,840	7,004,216	3,171,968

*April 1994
Source: City of Napa Planning Department

Source: Envision Napa 2020, Policy Document.

Figure N-1

Napa - Planning Areas

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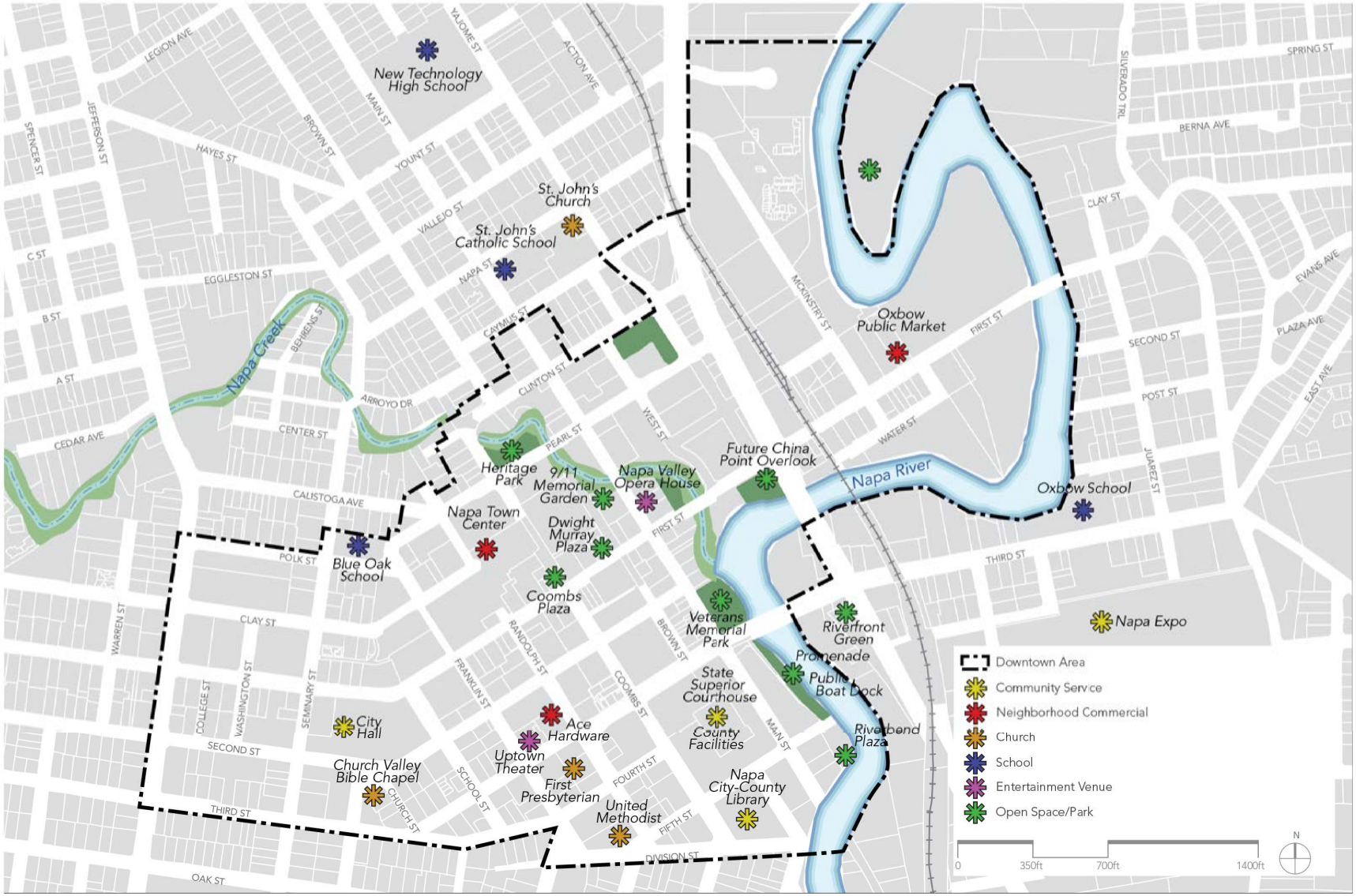


Source: City of Napa, 2016

Exhibit N-2

Downtown Napa - Destination Map

Existing Pedestrian Infrastructure

An inventory of existing sidewalks, marked crosswalks, curb ramps and trails was collected on key roadways throughout the city as part of this plan 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). For the City of Napa, this data was supplemented by a digital infrastructure inventory collected by the city as part of their Asset Management Program in March of 2014.

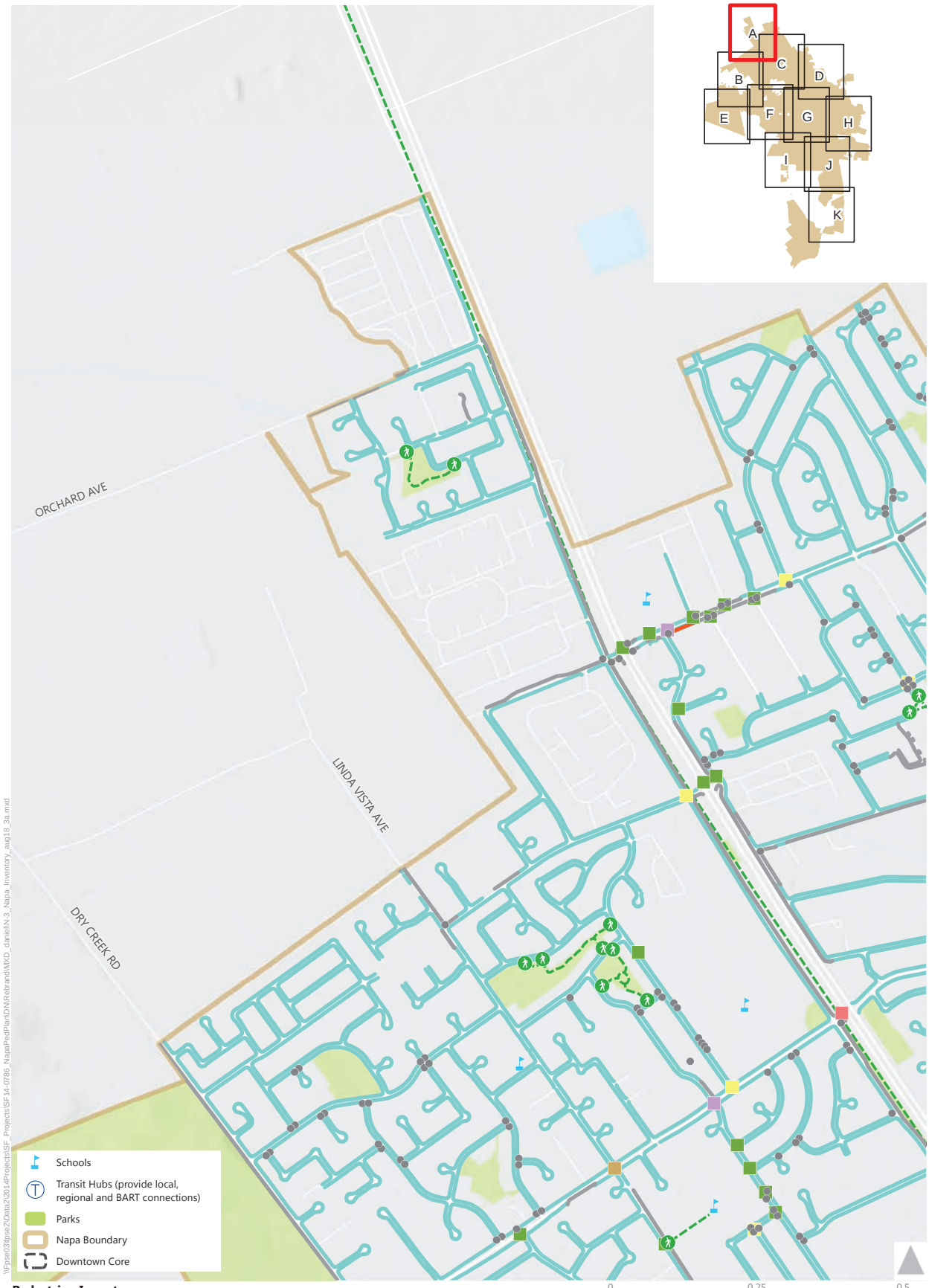
A GIS database assembled for the plan inventory includes additional detail beyond what is illustrated in the inventory maps, including the style of crosswalk striping, the method of vehicle control at the crosswalk (i.e., traffic signal, flashing beacon, stop sign, or uncontrolled), whether the crosswalk 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).

Napa Inventory

A roadway network of 111 miles in the City of Napa was identified by city staff for inventory collection as part of this plan. Key considerations for the plan inventory network included:

- Locations near the Downtown Core
- Roadways that connect residential development to both schools and downtown
- Locations near bus stops
- Blocks surrounding identified pedestrian collisions

This network was superseded by data from 219 miles of survey completed by the city as part of their Asset Management Program and is displayed on *Exhibit N-3*. As shown in Exhibit *N-3*, the downtown has a high concentration of marked crosswalks and a connected sidewalk network. Key corridors that have sidewalk gaps include Coombsville Road, Silverado Trail, Redwood Road, Linda Vista Avenue, Imola Avenue, Browns Valley Road, Sierra Avenue, and Salvador Avenue; sidewalk installation is planned along several of these corridors in the Countywide Transportation Plan (CTP), pending available funding.



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3a
Pedestrian Facility Inventory
City of Napa

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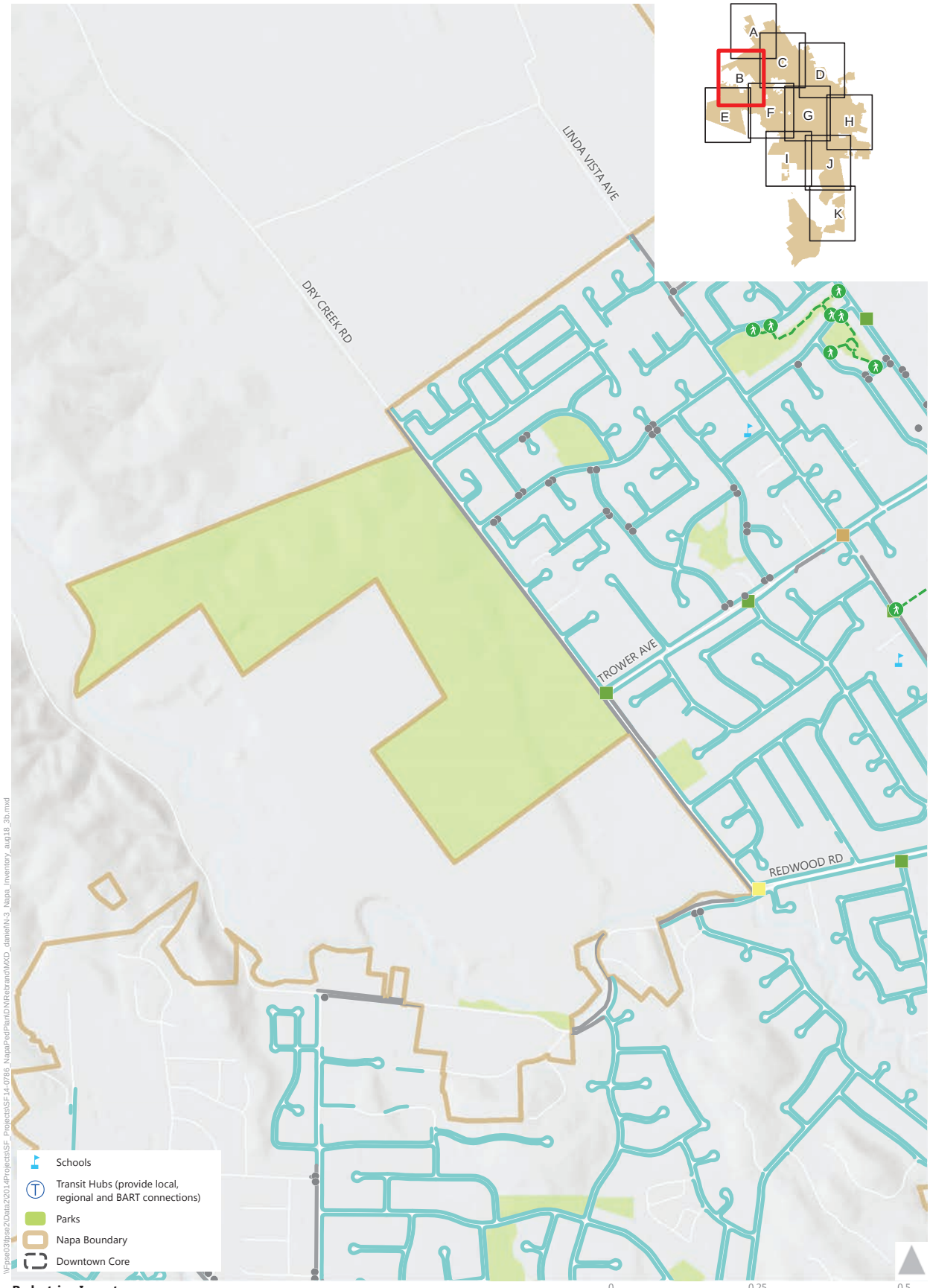

Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3b
Pedestrian Facility Inventory
City of Napa

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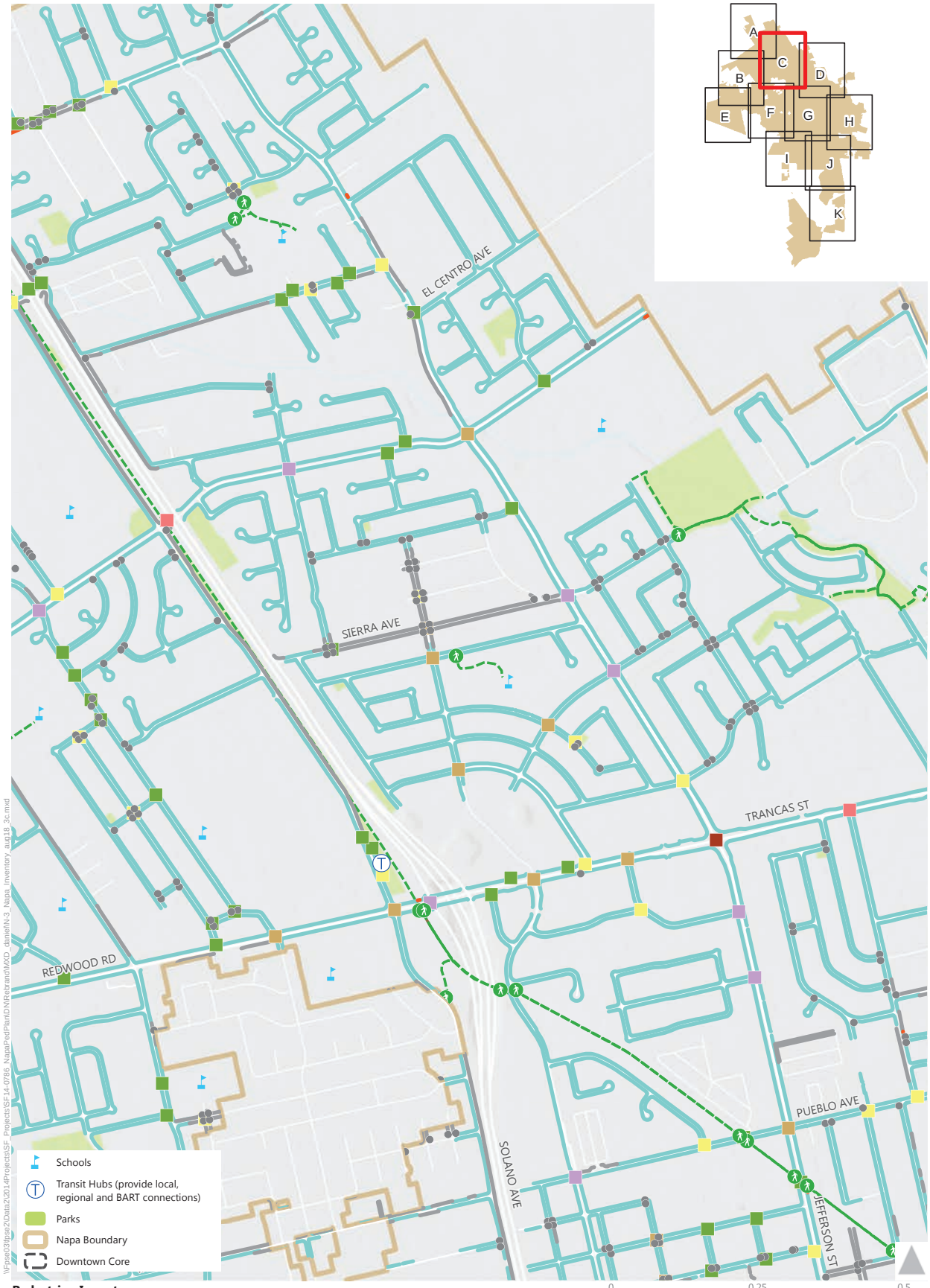

Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3c
Pedestrian Facility Inventory
City of Napa

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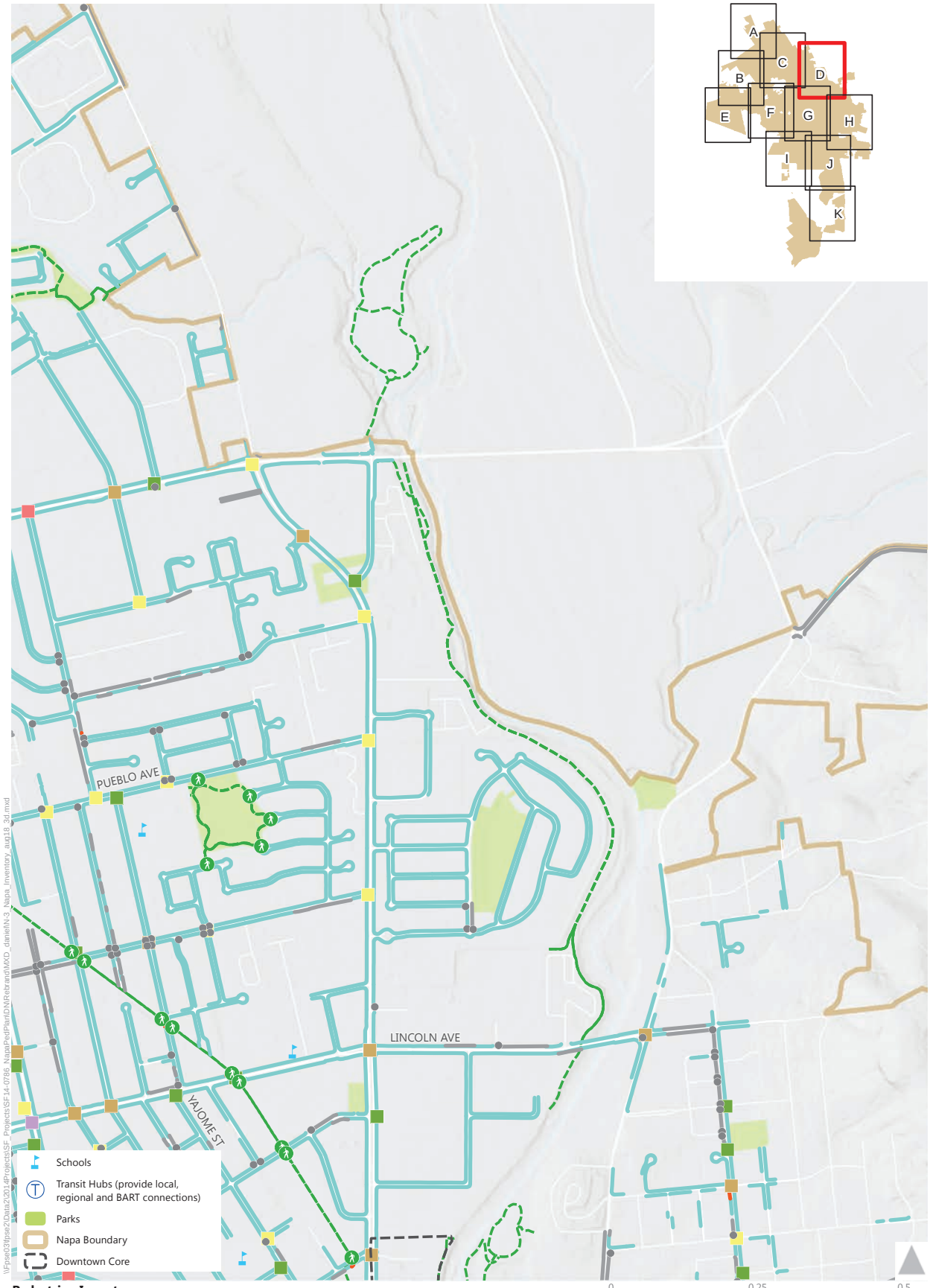


Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

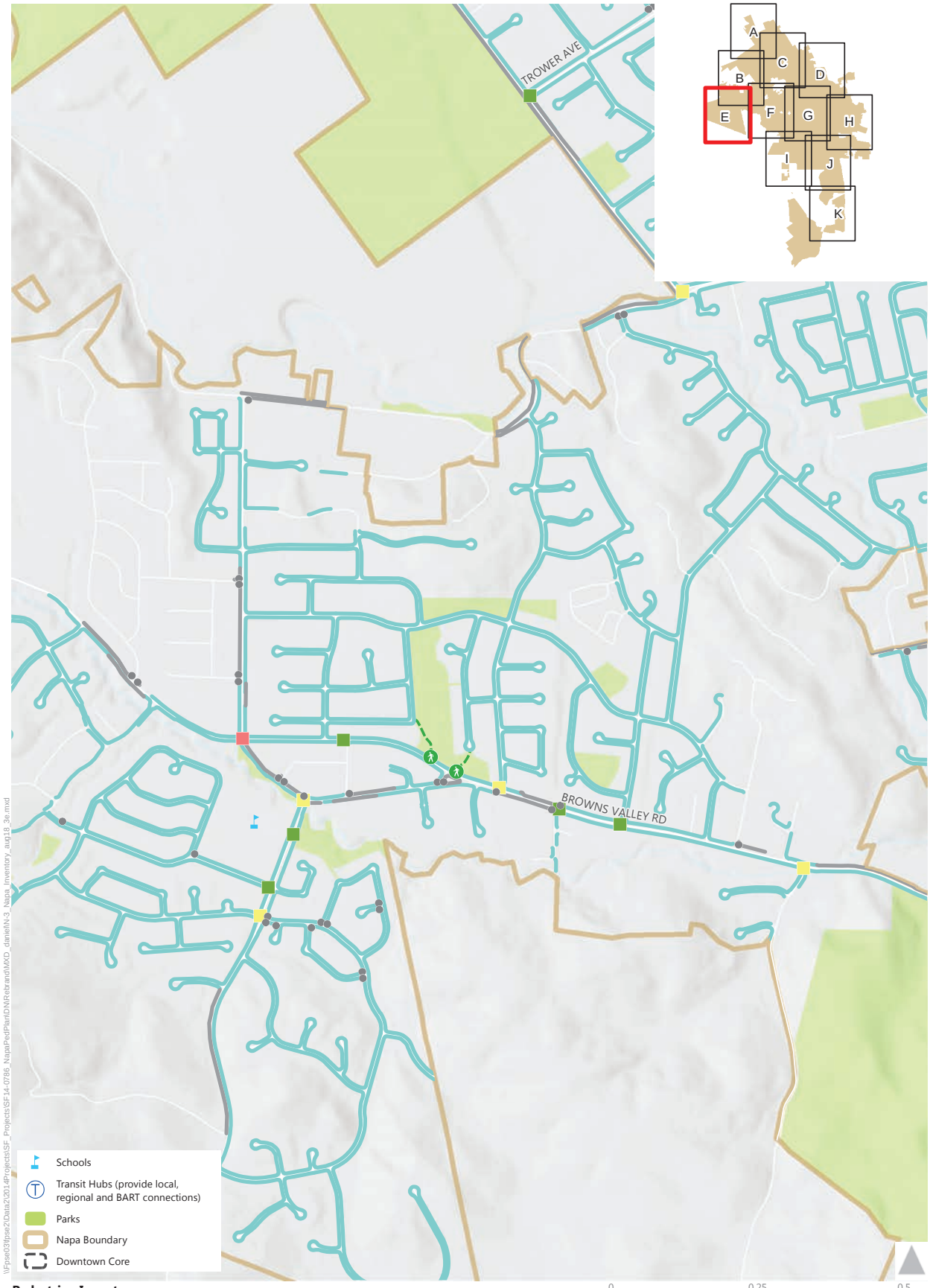
Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3d
Pedestrian Facility Inventory
City of Napa



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3e
Pedestrian Facility Inventory
City of Napa

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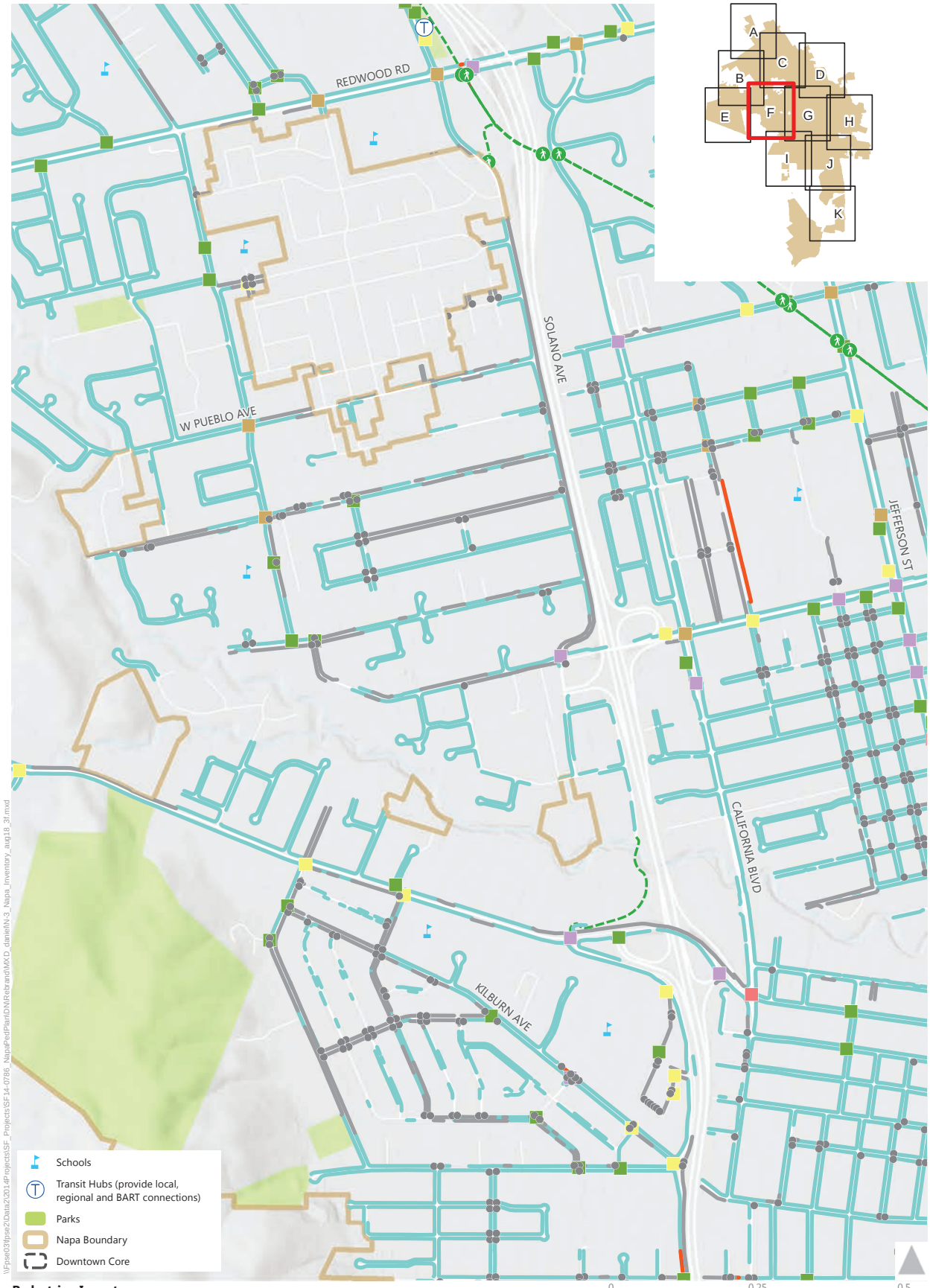

Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3f
Pedestrian Facility Inventory
City of Napa

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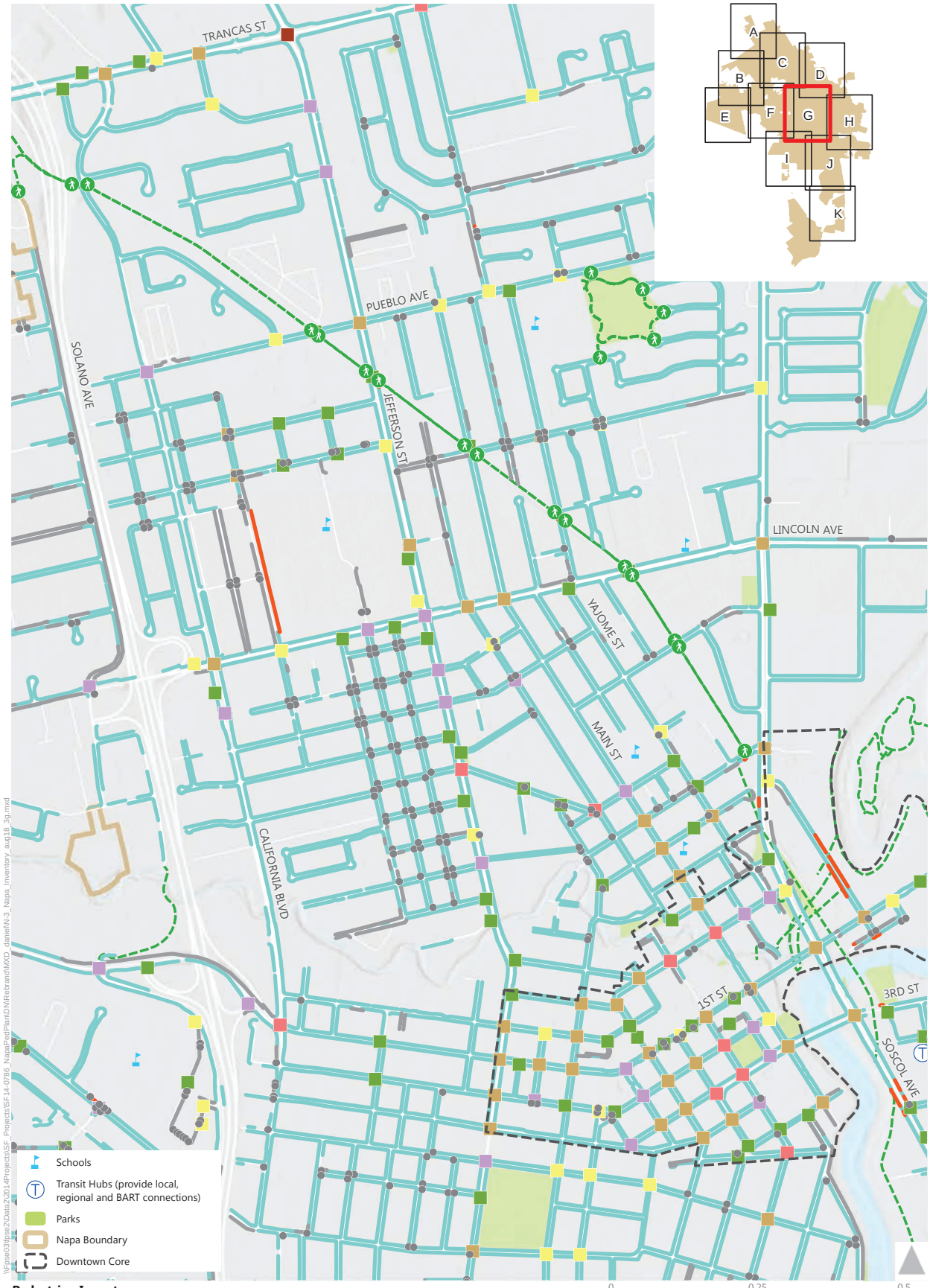


Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

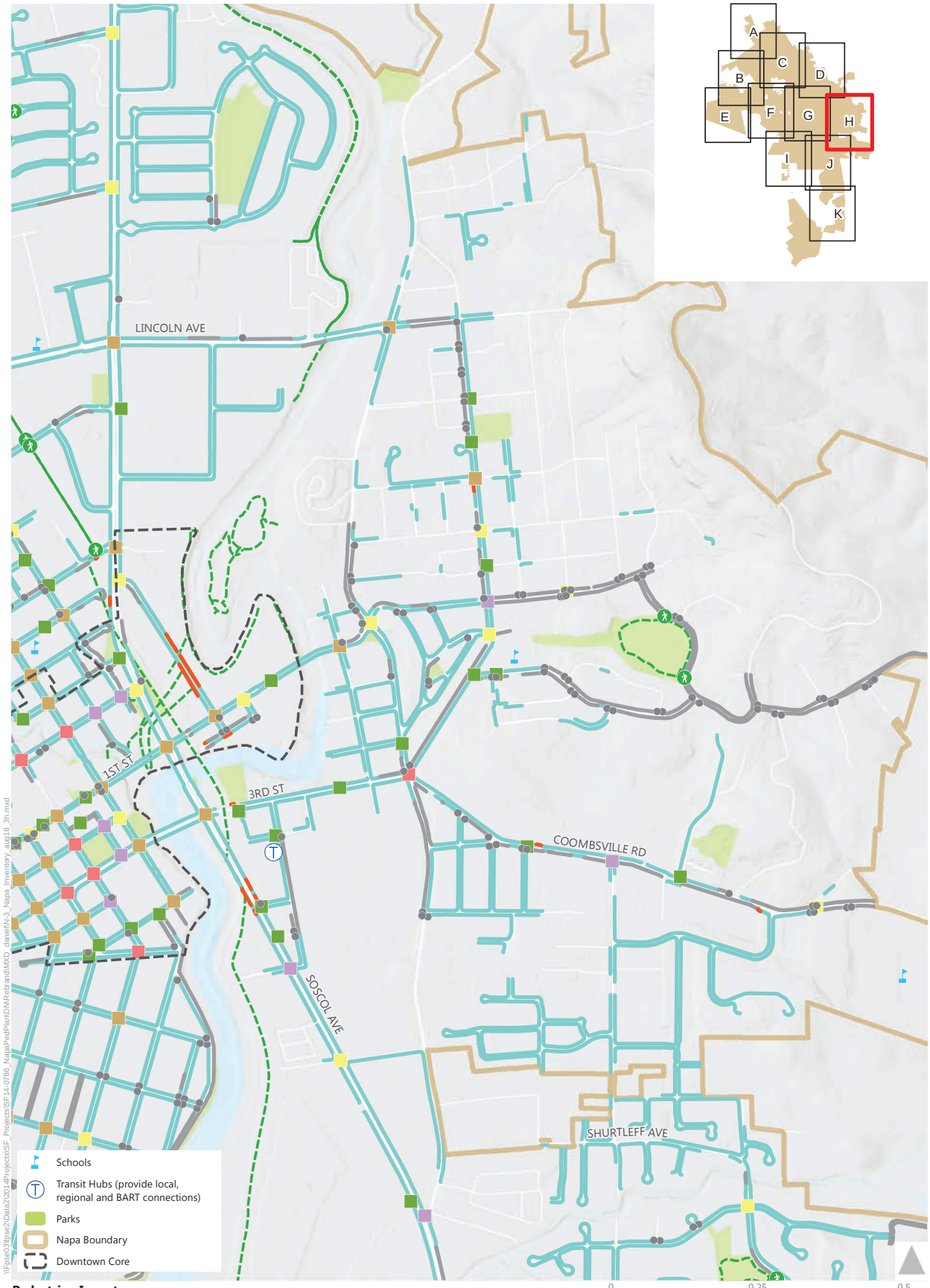
Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3g
Pedestrian Facility Inventory
City of Napa



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

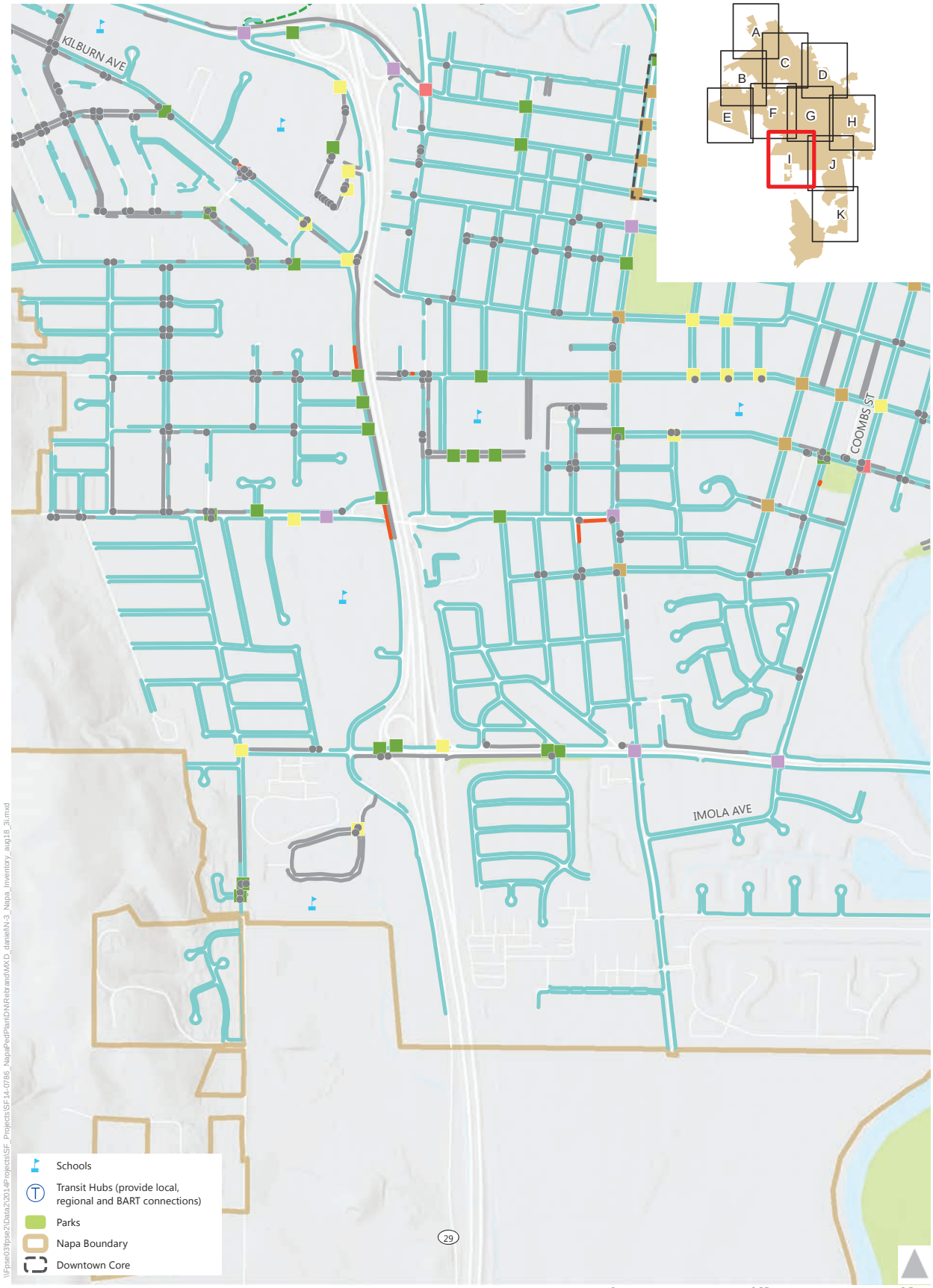
Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3h
Pedestrian Facility Inventory
City of Napa



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3i
Pedestrian Facility Inventory
City of Napa

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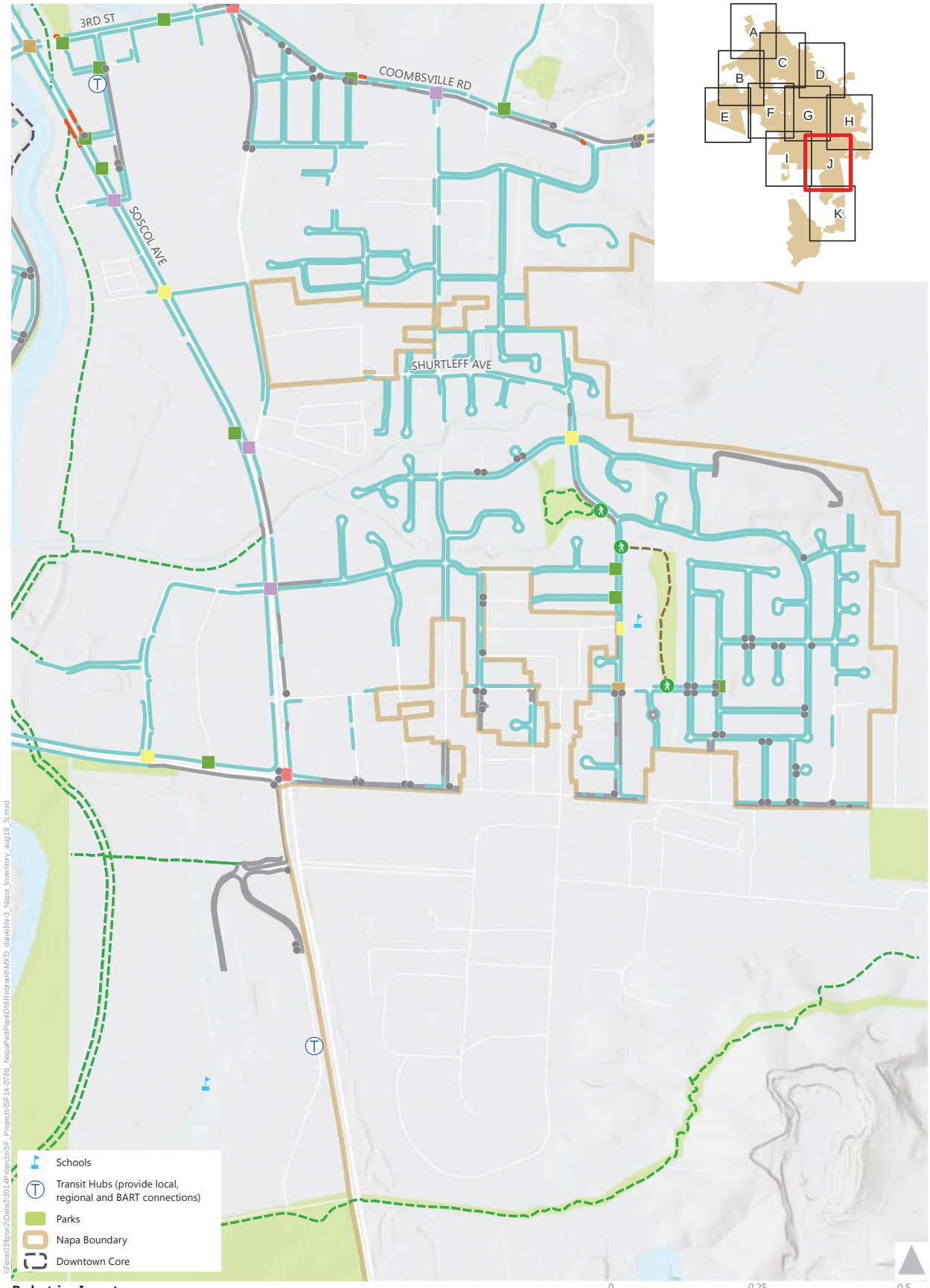

Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3j
Pedestrian Facility Inventory
City of Napa

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Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings*

** The intersection of a trail with a roadway, including the beginning or end of a trail.*

Sidewalk and curb ramp information on this map includes data collected as part of the City of Napa Asset Management efforts. Sidewalk condition is not displayed, only the presence of sidewalk.

Exhibit N-3k
Pedestrian Facility Inventory
City of Napa

Activity Levels

Pedestrian counts were conducted at 13 locations throughout Napa in October and November 2015. These locations were selected based on locations of proposed and potential projects in this plan, potential localized safety concerns, expected high levels of walking, and proximity to key pedestrian destinations, including schools and downtown commercial areas. **Table N-2** provides a summary of the two-hour counts completed within the city. Count results varied significantly based on population density of a given neighborhood, as well as by the adjacent land use.

TABLE N-2: COUNT PROGRAM LOCATIONS

ID	Jurisdiction	Location	Morning	Evening	School
			7-9AM	4-6PM	2-4PM
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 Street and Old Sonoma Road	12	27	
NA5	City of Napa	Jefferson Street and Sierra Avenue	206	43	138
NA6	City of Napa	Salvador Ave and Escuela Drive	34	26	29
NA7	City of Napa	Redwood Road. 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 Avenue and First Street	89	143	
NA10	City of Napa	Imola Avenue and Foster Road	63	34	67
NA11	City of Napa	Soscol Avenue at Kansas Avenue	44	49	
NA12	City of Napa	Soscol Avenue at Imola Avenue	23	117	
NA13	City of Napa	Undercrossing: SR 29 and Napa Creek	7	42	31

Counts were conducted near several schools to gauge the volume of students walking to and from school:

- Vintage High School (NA5)
- Salvador Elementary School (NA6)
- Redwood Middle School (NA7)
- Irene M. Snow Elementary School (NA10)

At the elementary schools, about 30-60 pedestrians were observed during the AM period (7-9 AM) and concurrent with school dismissal (2-4 PM). In contrast, between 140 and 200 pedestrians were observed walking through the selected intersections near Vintage High School and Redwood Middle School.

Two count sites (NA3 and NA12) were selected in close proximity to Napa State Hospital. Both locations observed limited walking during the AM period (less than 30 pedestrians in two hours), yet both recorded over 100 pedestrian crossings during the PM period (4-6 PM).

Pedestrian volumes at the intersection of Redwood Road and Solano Avenue were some of the highest observed of the selected count locations. Volumes were consistently higher than 100 for all three time periods observed, and were close to 200 during the afternoon period of 2-4 PM.

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 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.

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).

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. During this study period, the City has implemented several improvements such as sidewalk gap closures, bike lanes, and flashing beacons along the Lincoln Avenue, Jefferson Street, and California Boulevard corridors as well as at other locations in the City. Future data collection efforts such as pedestrian counts and collision monitoring in these locations will help determine the success of these projects.

Exhibit N-4 shows the locations of pedestrian collisions from 2003 – 2012 in Napa.

Exhibit N-4 presents raw collision counts only. While this is illustrative of “hot spot” areas in Napa (locations with three or more collisions), 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

As shown in *Exhibit N-4*, reported collisions in Napa from 2003-2012 outside of downtown are concentrated along Lincoln Avenue, Trancas Street, and Jefferson Street. Collision hotspots within the limits of downtown include the intersection of Jefferson Street at Clay Street and Pearl Street at Main Street.

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.

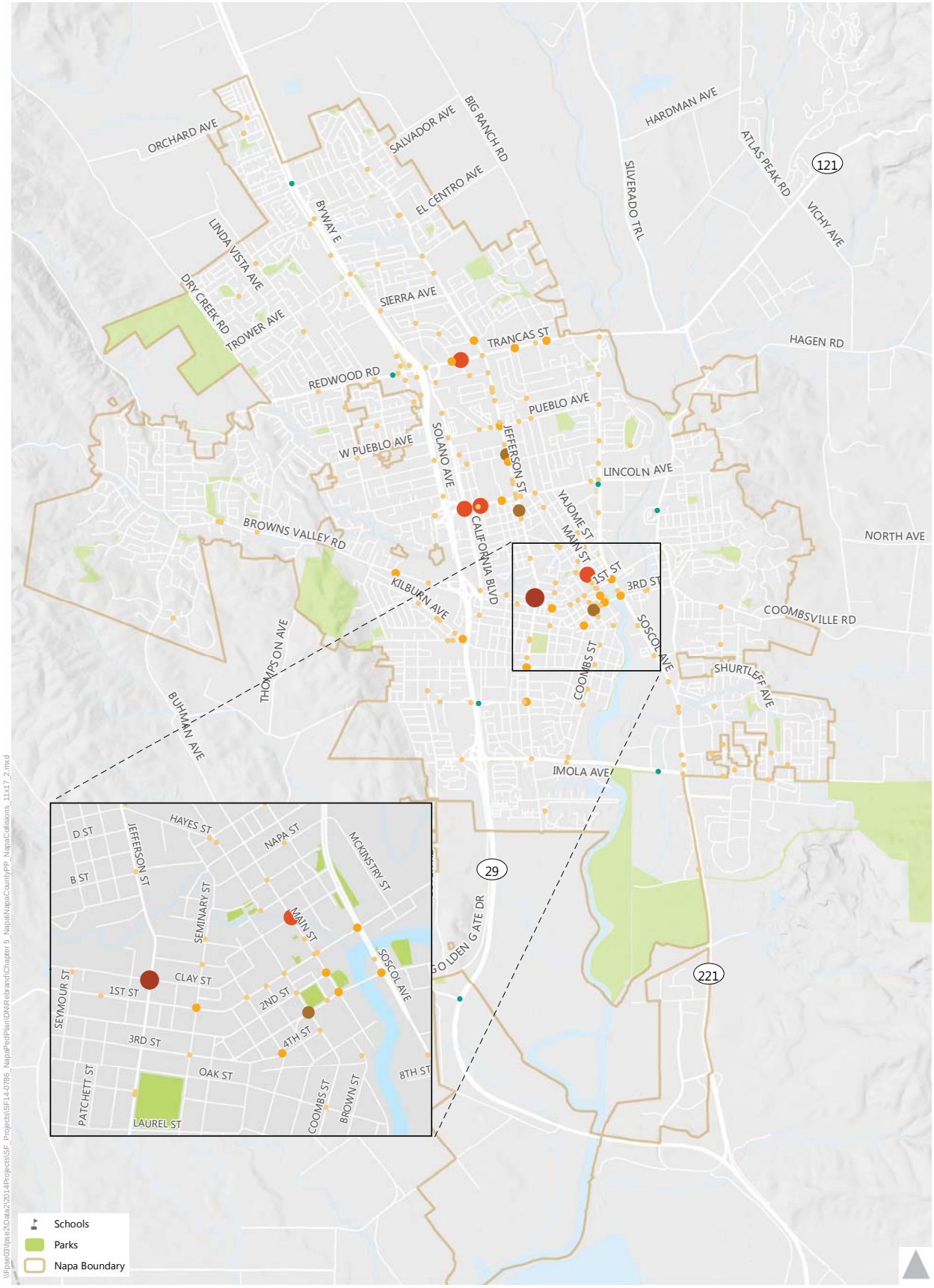
Pedestrian Actions

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 N-3** pedestrian safety issues surrounding collisions are typically focused around crossing locations. Systematic review and enhancements of crosswalks may be helpful to enhance safety in this area. Research and best practices on crosswalk enhancements are provided in the Crosswalk Guidelines in **Appendix D** of the Countywide Pedestrian Plan.

TABLE N-3: NAPA COLLISION SUMMARY PEDESTRIAN ACTIONS (2003-2012)

Pedestrian Action	Number of Collisions		
	Injury	Fatality	Total
Crossing in Crosswalk at Intersection	109	1	110
Crossing Not in Crosswalk	61	4	65
Walking In Road, Including Shoulder	38	1	39
Crossing in Crosswalk, Not at Intersection	9	0	9
Walking, Not in Road	8	0	8
Not Stated	3	0	3

Source: SWITRS



Pedestrian-Involved Collisions 2003-2012

- 1
- 2
- 3
- 4 - 5
- 6 - 7

Injury Collisions

- 1 Fatal Collision

Pedestrian Collision Hotspots

Density	Intersection	Total Collisions	Density	Intersection	Total Collisions
	3rd St and Coombs St	3		Lincoln Ave and California Blvd	4
	Jefferson St and H St	3		Trancas St and Claremont Way	4
	Jefferson St and Park Ave	3		Lincoln Ave and Marin St	5
	Main St and Pearl St	4		Jefferson St and Clay St	7

0 0.5 1 Mile

Exhibit N-4
Pedestrian-Involved Collisions
2003 - 2012 City of Napa

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 public input received during this process countywide is displayed in **Table N-4**. Connectivity and safety were the key themes across the countywide comments.

TABLE N-4: PUBLIC INPUT RECEIVED

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 “other” in Napa 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.

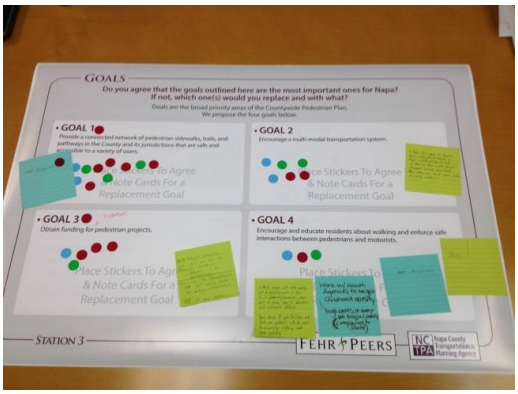
Public workshops were held throughout the County in Winter 2015: in Napa on January 22 at NVTA; in Yountville on January 27; in St. Helena on January 28; and in American Canyon on February 4. Due to recent public workshops held in Calistoga through development of their Active Transportation Plan in 2014, 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 which issues 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 perceived barriers to pedestrian travel and locations where improvements were desired. 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 were used as one of many inputs to inform the decision for recommended improvements in this plan. The results of this mapping exercise included just fewer than 80 comments in the City of Napa, and results are shown in *Exhibit N-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 N-4. Examples of these miscellaneous comments included suggestions for specific treatments such as sidewalk widening, stop signs, or landscaped medians as well as general comments to improve corridors or opportunities to improve pedestrian facilities along the Napa River. 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.
- **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.

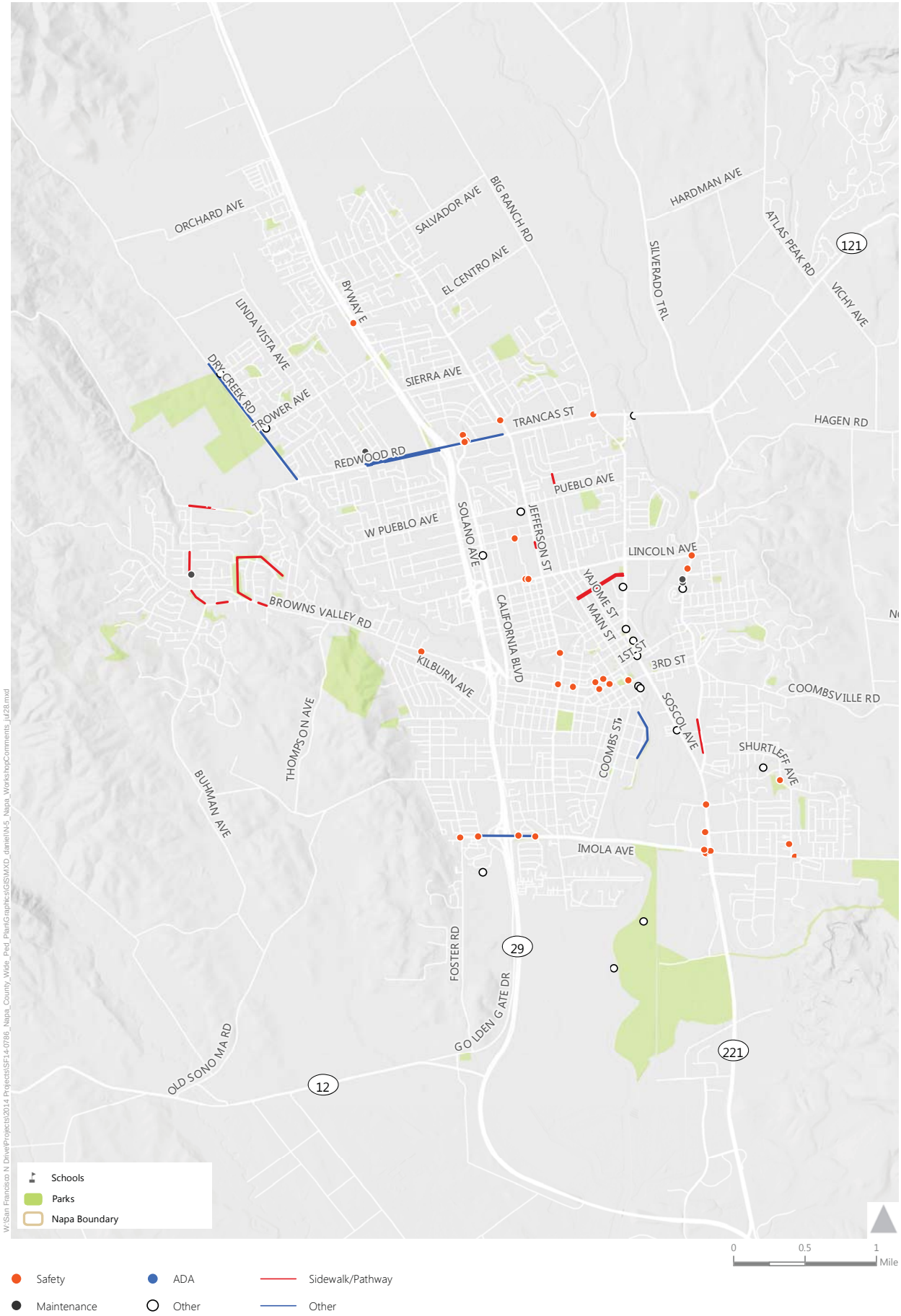
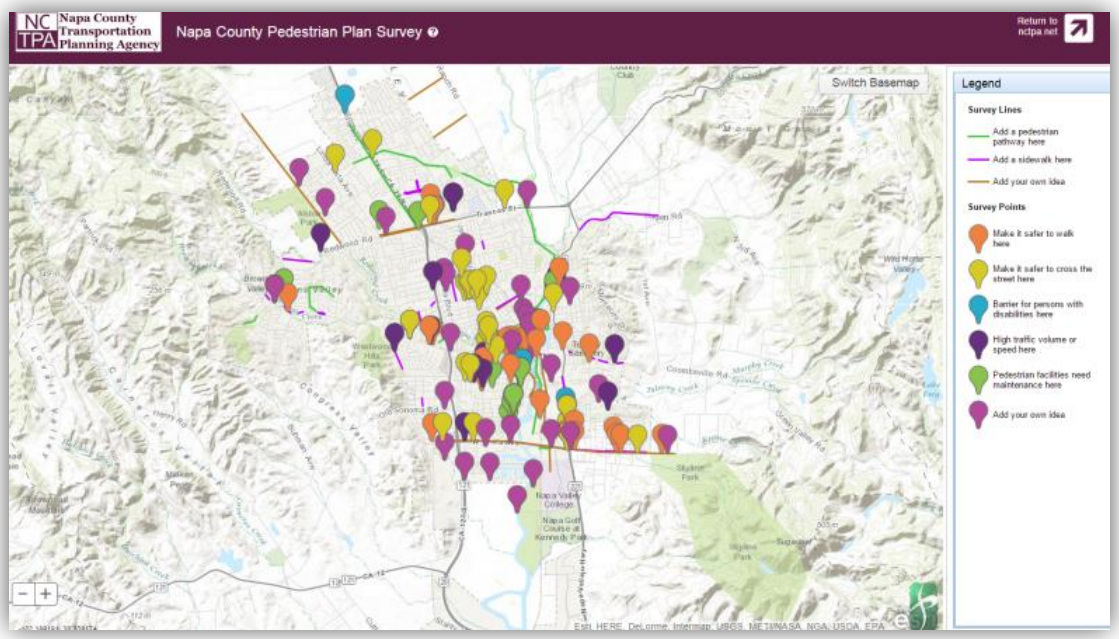


Exhibit N-5
Workshop Comments
City of Napa

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.

Napa-Specific Focus Groups

At the outset of the plan development process, meetings were held with key staff from Napa to initiate the planning process on December 17, 2014.

This meeting included a discussion of existing programs, policies and practices. Key strengths, enhancements, and opportunity areas are provided in the benchmarking summary table in **Appendix N-A**.

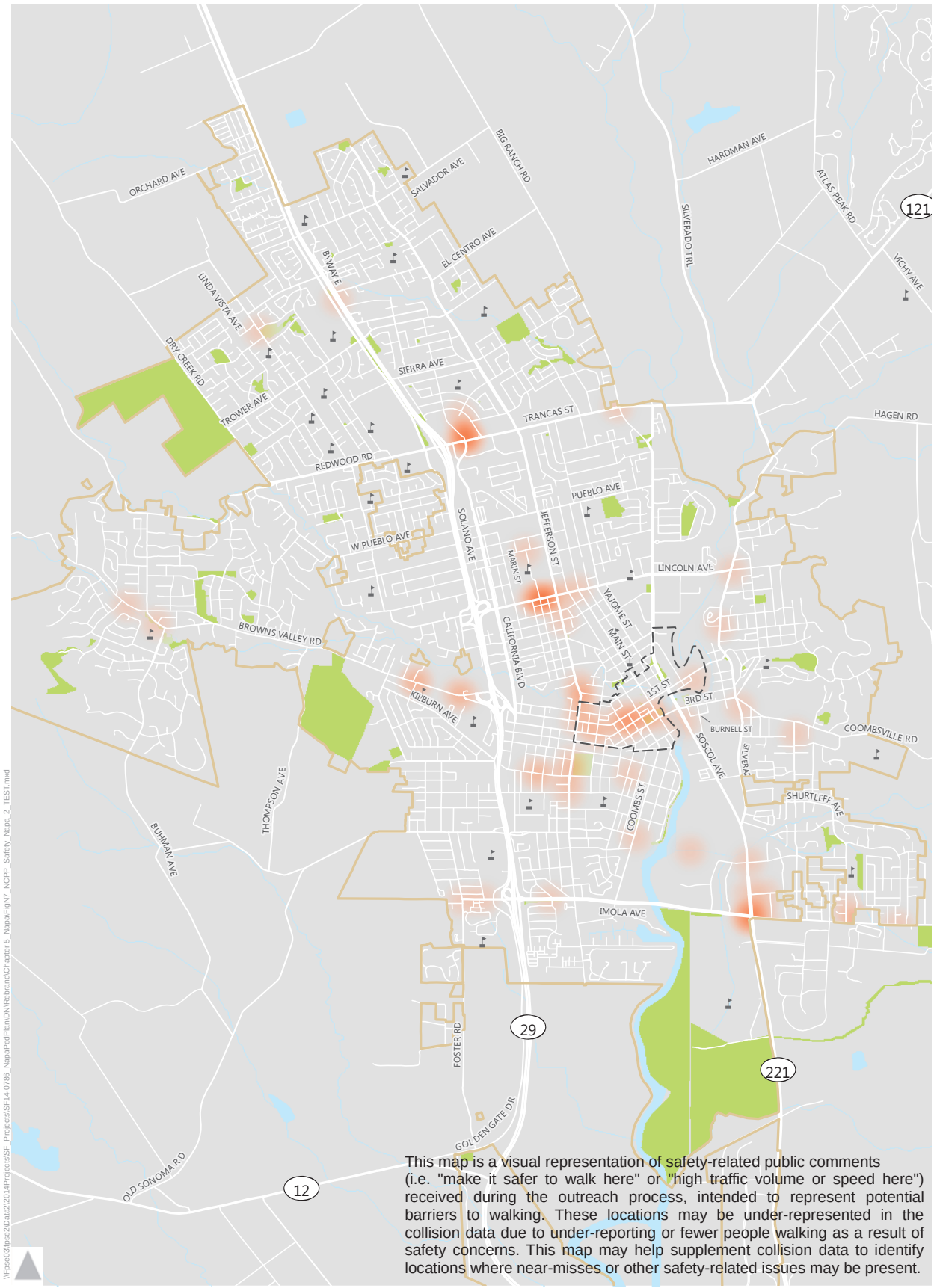
Jurisdiction staff also provided input during the initial benchmarking meeting and at the public workshops on key areas where pedestrian improvements are planned and in some cases, where connections and safety improvements are desired. This input was used to inform potential opportunities for walking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

Additional focus group meetings were held for the Napa walking audit on May 18, 2015, and to review the list of suggested pedestrian projects on September 18, 2015.

Perceived barriers

As shown in **Table N-4**, connectivity and safety are two of the top pedestrian issues identified from the public. To geographically visualize the safety-related public comments received during the outreach process in Napa, a heat map was created, shown in Exhibit N-6. This map is intended to represent perceived barriers to walking. The locations shown may be under-represented in the collision data due to under-reporting of SWITRS data[5] or fewer people walking as a result of these perceived issues. The map may help supplement collision data to identify locations where near misses or other safety-related issues may be present.

[5] 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



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.

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Schools
Parks
Napa Boundary
Downtown Core

Safety-Related Comments

Many Issues (5) ← Few Issues (0)

0 0.5 1 Mile

Exhibit N-6
Perceived Barriers: As Visualized by Safety-Related Public Comments
City of Napa

Opportunity Areas

Napa's historic street grid network downtown, expanding trail system, numerous shopping and dining options and beautiful riverfront create many enjoyable places to walk. The city has identified numerous projects as part of the Countywide Transportation Plan that will improve pedestrian mobility and connectivity and this plan expands on those efforts by developing a list of additional recommended pedestrian facilities within key focus areas of the city and referencing those that have been developed by other plans. Initial suggested 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 Napa. 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 Napa, 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 N-7*.

As illustrated on *Exhibit N-7*, Ped INDEX focus locations (areas with high potential for pedestrian demand) include the downtown core, Redwood Road near Solano Avenue, Trancas Street to the east and west of Jefferson Street, areas along Lincoln Avenue and Jefferson Street near Napa High School, and neighborhood pockets near Phillips Charter School and Imola Avenue. After reviewing the locations of comments received during public outreach and the alignment with focus locations on the Ped INDEX maps, potential walking audit routes were recommended to city staff:

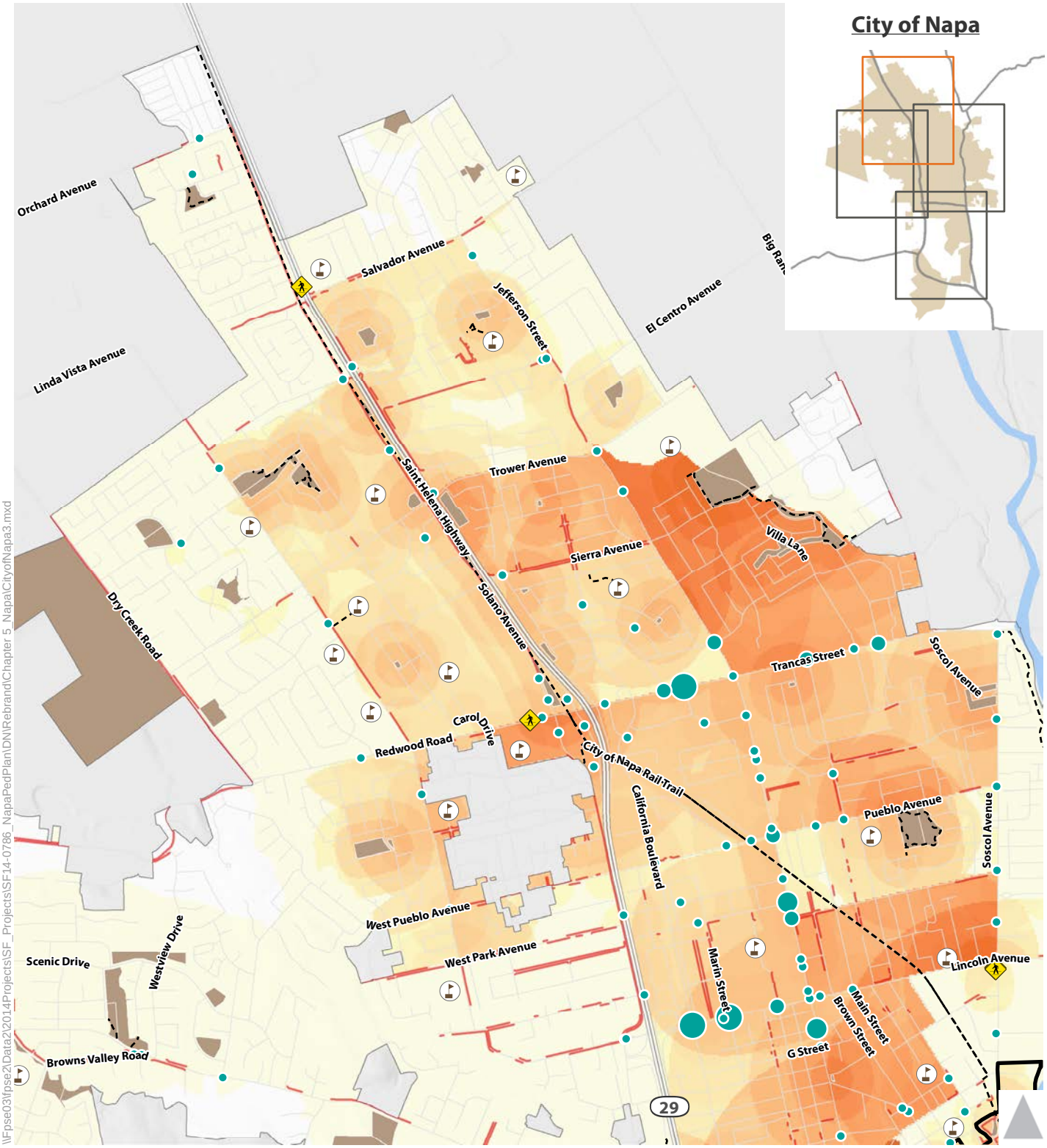
- **Imola Corridor**: Imola Avenue from Coombs Street to Patton Avenue (1.75 miles)
  Imola Corridor is a priority corridor for the city and sidewalk improvements are included on the CTP Project list. Walking audits were completed on July 30 2014 to identify issues, although visual aid graphics were not completed as a result. This potential walking audit was suggested to coordinate with any existing plans for the corridor and help identify additional traffic calming and crossing improvements, with an expanded group of stakeholders.

- **Jefferson Street:** Jefferson Street from Pine Street to B Street (.8 miles)
  This roadway received several public comments between Pine Street and A Street regarding the desire for crossing improvements at several intersections north of 2nd Street and the concern of high vehicle speeds along Fuller Park. This potential walking audit route was suggested to overlap with multiple pedestrian collision "hot spots" within the past ten years, including seven at Jefferson Street and Clay Streets, three between Laurel Street and Pine Street, and two at Jefferson Street and Stockton Street. The street is also adjacent to downtown and serves as a vital north-south connection from the neighborhoods to the south.
- **Lincoln Avenue:** Lincoln Avenue from Jefferson Street to California Boulevard (.35 miles)
  This corridor has several pedestrian collision "hot spots" in the last 10 years, including five at Lincoln Avenue and Marin Street, four at Lincoln Avenue and California Boulevard, and 6 near Jefferson Street and Lincoln Avenue. This stretch of Lincoln Avenue also overlaps with several public comments requesting improved crossings of Lincoln Avenue between Jefferson Street and York Street, adjacent to Napa High School.
- **Redwood Road / Trancas Street:** Redwood Road / Trancas Street from Redwood Retirement Living to Beard Road – 1.1 miles
  Redwood Road/Trancas Street was a topic of conversation at the public workshop, especially near the Bel Aire Plaza. Several attendees reported walking along Redwood Road to access the shopping center, and requested sidewalk improvements along the corridor as well as crossing improvements at the shopping center entrance and within the shopping center itself. The intersection of Trancas Street and Claremont Way had four reported pedestrian collisions in the last 10 years, and 5 additional pedestrian collisions have been reported along the roadway near the hospital and 3 just west of SR 29.

Downtown was not included in the suggested walking audits because the area was recently studied with the Downtown Specific Plan (2014); however, candidate locations for a future walk audit downtown that aligns with several public comments and pedestrian-involved collisions, include 1st Street, 2nd Street, Main Street, Franklin Street, and Coombs Street, to total .75 miles.

After discussions with city staff regarding candidate locations, it was determined that the Imola Avenue corridor would not be the best use of time and study because walking audits and stakeholder recommendations were recently completed along the corridor. A combination of the above recommended focus areas, to maximize the distance that could be feasibly studied during a half-day walking audit, for a total of approximately one and a half miles, was chosen for study:

- Jefferson Street from B Street to Old Sonoma Road
- Redwood Road from Linda Vista Avenue to Solano Avenue



Demand:

Pedestrian Index Score

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1 2 3 4-5

Pedestrian Fatality

Missing Sidewalks

Legend:

Downtown

Parks

Trail/Path

School

Exhibit N-7a

North Napa - Pedestrian Index Demand & Deficiencies

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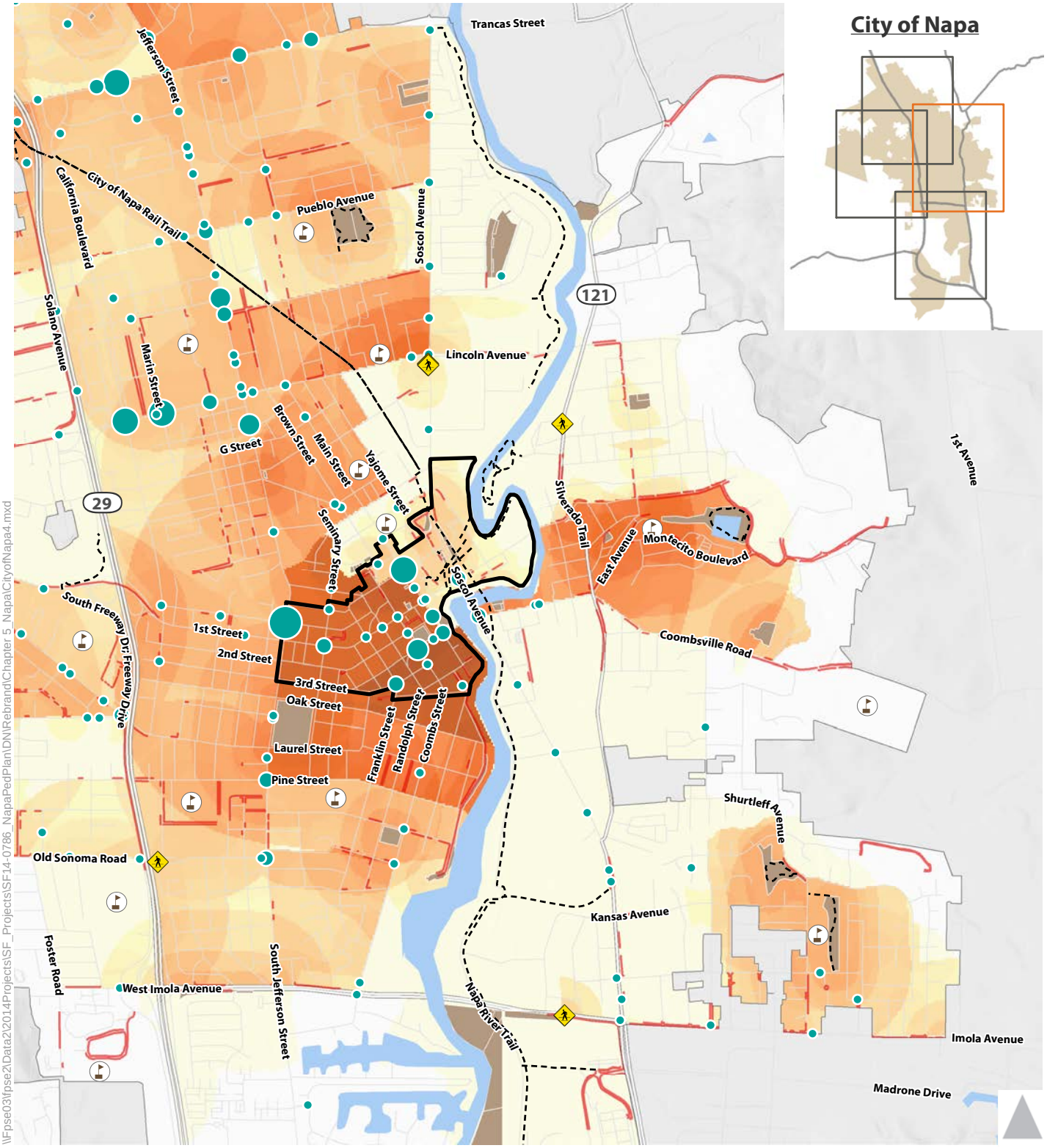

Demand:

Pedestrian Index Score

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1 2 3 4-5 6-7

Pedestrian Fatality

Missing Sidewalks

Legend:

Downtown

Parks

Trail/Path

School

Exhibit N-7b

East Napa - Pedestrian Index Demand & Deficiencies

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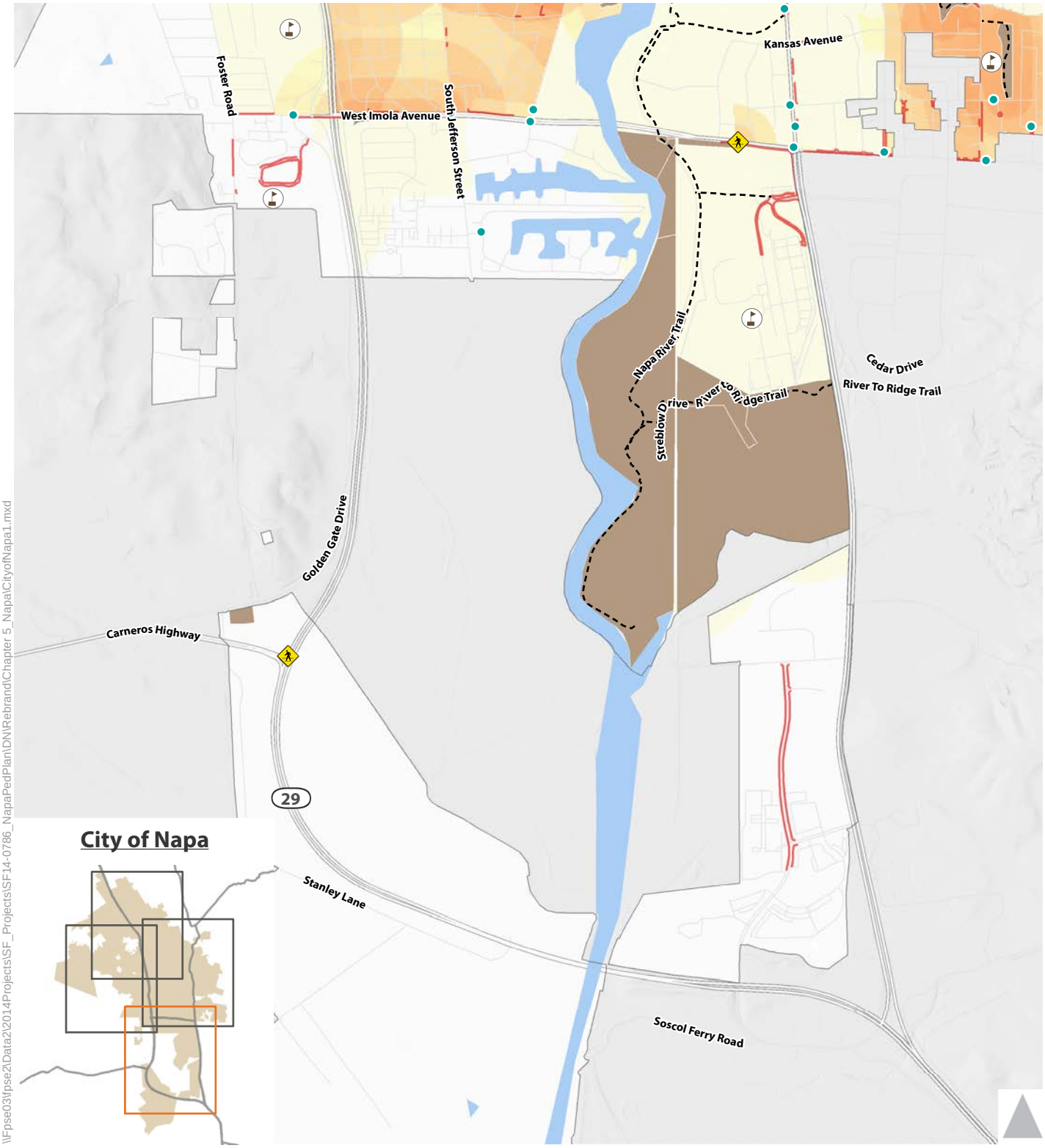

Demand:

Pedestrian Index Score

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1

Pedestrian Fatality

Missing Sidewalks

Legend:

Downtown

Parks

Trail/Path

School

Exhibit N-7c

South Napa - Pedestrian Index Demand & Deficiencies

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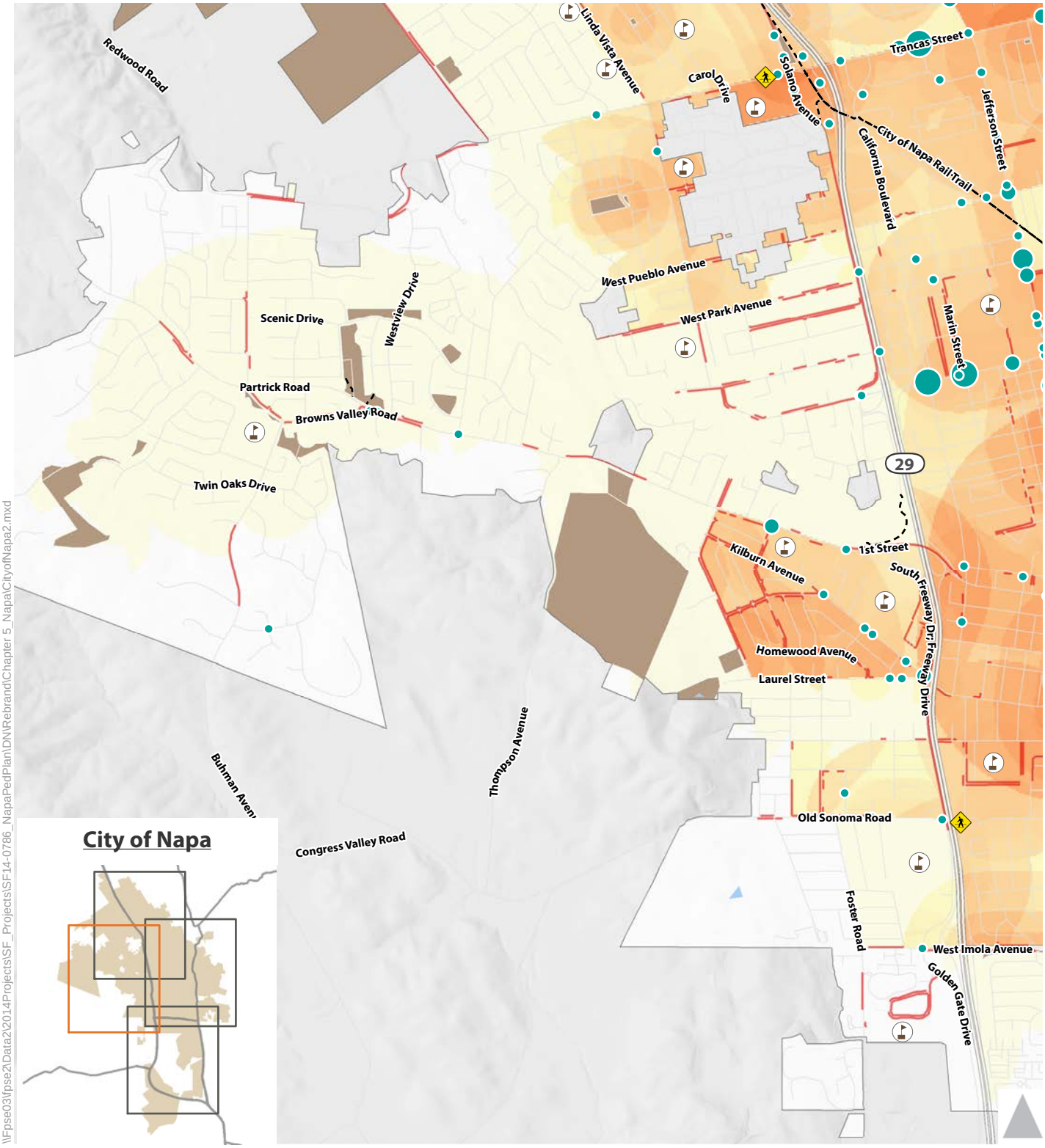

Demand:

Pedestrian Index Score

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1 2 3 4-5

Pedestrian Fatality

Missing Sidewalks

Legend:

Downtown

Parks

Trail/Path

School

Exhibit N-7d

West Napa - Pedestrian Index Demand & Deficiencies

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Project Development and Evaluation

An important outcome of this plan is the designation of a project list and a set of evaluation criterion. The 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 May 2015 to observe field conditions and brainstorm potential ideas for improvement with the following stakeholders:

- Julie Lucido, Senior Civil Engineer
- Lorien Clark, Transportation Planner
- Michael Walker, Senior Planner
- Joel King, NVTA ATAC

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 potential enhancements.

Project List and Map

Pedestrian projects developed by the city during the efforts for the CTP or similar, recent efforts are shown on *Exhibit N-8*. Potential enhancements discussed during the Pedestrian Plan walking audits are shown in *Exhibit N-9*.

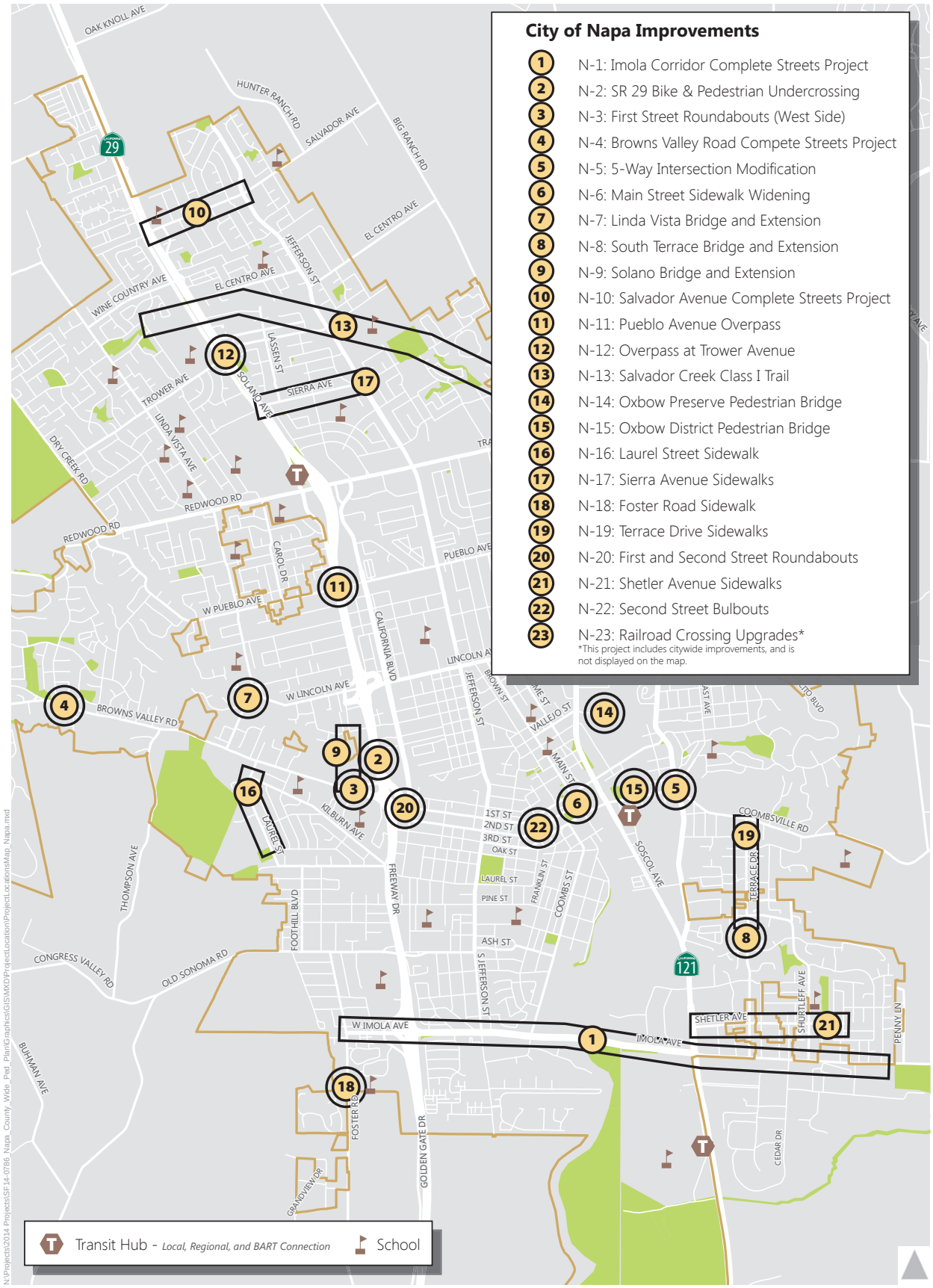

Exhibit N-8

City of Napa - Project Locations

Exhibit N-9

City of Napa - Walk Audit Potential Enhancements

Project Benefits

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. By using a set of consistent metrics Citywide, city staff can determine the relevance of projects for specific funding sources and weigh the benefits of eligible projects as funding opportunities arise. The proposed projects and potential enhancements in this plan were preliminarily evaluated in Napa according to:

- Local support
- Safety enhancements
- Proximity to transit
- Proximity to schools
- Connectivity, including sidewalk gap and trail connections

These criteria and the metrics used to define them are described in more detail in **Appendix N-C**. A summary of each pedestrian improvement project and recommendations from the walking audits are shown in **Table N-5** below. Detailed descriptions of the improvements and evaluation results can be found in **Appendix N-C.**

Funded or Constructed Projects

A southbound bus stop on Jefferson Street was recently relocated from Calistoga Avenue to B Street, improving motorists' visibility of pedestrians crossing Jefferson Street to access the bus stop. Additionally, the City of Napa has recently installed several Rectangular Rapid Flashing Beacons at multiple crosswalks around the city.

On-Going Maintenance, Planned Projects and Potential Enhancements

The City of Napa manages on-going maintenance needs of the pedestrian network citywide, often due to buckling sidewalks from root damage and other requests from the community. Due to limited funding and the desire to balance the needs of all users with available resources, the city focuses on maintaining and expanding the existing sidewalk network. The city has also identified several other projects as part of the CTP, shown in **Table N-5**. Sidewalk gap closure projects are an important enhancement to pedestrian mobility, and several sidewalk projects are included as part of the city's planned project list below. Several sidewalk gaps were noted during the walking audits for this plan, many of which presented engineering and cost challenges due to right-of-way constraints or significant utility conflicts. Walking audit recommendations represent potential improvements to the study locations, and could serve as examples to consider in other areas of the city, based on local priorities. Several potential enhancements developed during the walking audits along Redwood Road and Jefferson Street present potential opportunities for coordination with CTP projects and thus efficiencies in funding and implementation.

TABLE N-5: NAPA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost[3]**
ON-GOING SYSTEM MAINTENANCE AND GAP CLOSURE				
Sidewalk Gap Closure and Maintenance (No. 18 CTP Program)	Citywide	Sidewalk maintenance, rehabilitation, and expansion	Sidewalks Maintenance	$$$
CTP OR PRIOR PLANNED PROJECTS				
N-1 Imola Corridor Bicycle and Pedestrian Improvements (No. 12 Constrained CTP Project)	Imola Avenue from Foster Road to Eastern city limits	Sidewalks and bicycle facilities	Sidewalks Pathway	$6,500,000
N-2 SR 29 Bike & Pedestrian Undercrossing (No. 14 Constrained CTP Project)	North Bank of Napa Creek, under SR 29 at approximately post mile 11.67	Bicycle and pedestrian undercrossing	Pathway	$850,000
N-3 First Street Roundabouts (West Side) (No. 16 Constrained CTP Project)	First Street at Freeway Drive and at SR 29 Southbound Ramps	Roundabouts	Traffic Calming	$8,500,000
N-4 Browns Valley Road Complete Streets Project (No. 17 Constrained CTP Project)	Browns Valley Road from Westview Drive to McCormick Lane	Widening to provide sidewalks and bike lanes	Sidewalks	$3,500,000
N-5 5-Way Intersection Modification (No. 18 Constrained CTP Project)	Silverado Trail at 3rd Street / Coombsville Road / East Avenue	Intersection alignment and crossing enhancements	Crossing treatments	$8,500,000

TABLE N-5: NAPA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost[3]**
N-6 Main Street Sidewalk Widening (No. 20 Constrained CTP Project)	Main Street from 1st to 3rd Street	Sidewalk widening, signal timing improvements for crossings	Sidewalks Crossing treatments Signal timing/operations	$2,000,000
N-7 Linda Vista Bridge and Extension (No. 21 Constrained CTP Project)	Linda Vista Avenue from southern terminus of Linda Vista to Robinson Lane	New bridge over Redwood Creek and extension	Sidewalks Crossing barrier removal	$3,500,000
N-8 South Terrace Bridge and Extension (No. 34 CTP Project)	Terrace Drive from Southern terminus of Terrace Drive to Northern Terminus South Terrace Drive	New bridge over Cayetano Creek and extension	Sidewalks Crossing barrier removal	$3,500,000
N-9 Solano Bridge and Extension (No. 35 CTP Project)	Solano Avenue from southern terminus of Solano Avenue to First Street	New bridge over Napa Creek and extension	Sidewalks Trail connection Crossing barrier removal	$7,000,000
N-10 Salvador Avenue Complete Streets Project (No. 37 CTP Project)	Salvador Avenue from SR 29 to Jefferson Street	Widening to provide sidewalks and bike lanes	Sidewalks	$2,500,000
N-11 Pueblo Avenue Overpass (No. 39 CTP Project)	Pueblo Avenue from West Pueblo Avenue to Pueblo Avenue	Pueblo Avenue overpass	Sidewalks Crossing barrier removal	$30,000,000
N-12 Overpass at Trower Avenue (No. 40 CTP Project)	Trower Avenue at SR 29	Grade separation improvements	Crossing treatments Crossing barrier removal Traffic Calming	$30,000,000
N-13 Salvador Creek Class I Trail (No. 52 CTP Project)	Adjacent to Salvador Creek, Maher Street to Big Ranch Road	Class I multi-use path	Pathway	$800,000

TABLE N-5: NAPA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost[3]**
N-14 Oxbow Preserve Pedestrian Bridge (No. 54 CTP Project)	Napa River, River Trail to Oxbow Preserve	Pedestrian bridge	Pathway Crossing barrier removal	$1,250,000
N-15 Oxbow District Pedestrian Bridge (No. 55 CTP Project)	Napa River, River Trail to Third Street	Pedestrian bridge	Pathway Crossing barrier removal	$1,250,000
N-16 Laurel Street Sidewalk (No. 56 CTP Project)	Laurel Street from Laurel Manor to Laurel Park	Sidewalks	Sidewalks	$2,500,000
N-17 Sierra Avenue Sidewalks (No. 58 CTP Project)	Sierra Avenue from SR 29 to Jefferson Street	Sidewalks	Sidewalks	$800,000
N-18 Foster Road Sidewalk (No. 59 CTP Project)	Foster Road adjacent to Snow Elementary School	Sidewalks	Sidewalks	$750,000
N-19 Terrace Drive Sidewalks (No. 60 CTP Project)	Terrace Drive	Sidewalks	Sidewalks	$1,500,000
N-20 First and Second Street Roundabouts	California Boulevard at First Street and at Second Street	Roundabouts	Traffic Calming	$8,500,000
	First Street at SR 29 NB On/Off Ramps	Roundabouts	Traffic Calming	$8,500,000
N-21 Shetler Avenue Sidewalks	Shetler Avenue, corridor wide	Sidewalk gap closure	Sidewalks	$$$
N-22 Second Street Bulbouts	Second Street at Franklin Street and at School Street	Curb extensions	Crossing treatments	$$
N-23 Railroad Crossing Upgrades (No. 24 CTP Project)	Citywide	Concrete panels with flangeway fillers	ADA	$$$

TABLE N-5: NAPA PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost[3]**
WALK AUDIT POTENTIAL ENHANCEMENTS[1]				
N-24 Redwood Road Corridor Improvements	Redwood Road from Linda Vista Avenue to Solano Avenue	Road diet feasibility assessment, sidewalk or walkway	Traffic Calming Sidewalks	$$$
N-25 Redwood Road Intersection Improvements	Redwood Road at Linda Vista Avenue, at Dover Street, and at Carol Drive	Crosswalk enhancements[2], signal timing improvements	Crossing treatments Signal timing/operations	$$
	Redwood Road at Solano Avenue	Crosswalk enhancements[2]	Crossing treatments	
N-26 Redwood Road Transit Improvements	Redwood Center Shopping	Bus shelter	Transit	$$
N-27 Jefferson Street Intersection Improvements	Jefferson Street at B Street and at Calistoga Avenue	Crosswalk enhancements[2]	Crossing treatments	$$$
	Jefferson Street at Clay Street	Crosswalk enhancements[2]	Crossing treatments	
	Jefferson Street at 1st, 2nd, and 3rd Street	Crosswalk enhancements[2], sidewalk, and signal timing improvements	Crossing treatments Signal timing/operations Sidewalk	
	Jefferson Street at Oak Street, Jefferson Street at Laurel Street, and at Fuller Way	Crosswalk enhancements[2], repurposed southbound right turn lane, marked crosswalks	Place Making Crossing treatments	
	Jefferson Street at Pine Street	Crossing enhancements[2]	Crossing treatments	
	Jefferson Street at Elm Street	Crosswalk enhancements[2]	Crossing treatments	
	Jefferson Street at Old Sonoma Road	Marked crosswalk, sidewalk and crossing enhancements[2]	Crossing treatments Sidewalk	
N-28 Jefferson Street Corridor Improvements	Jefferson Street from B Street to Old Sonoma Road	Pedestrian-scale lighting	Place Making	$$$
	Jefferson Street from Elm Street to Ash Street	Sidewalk	Sidewalks	

1. These do not represent planned improvements but rather potential enhancements to the roadways walked during the May 2015 walking audits.
2. See Appendix N-C for Additional details on potential enhancements
3. Costs that do not include an estimated range (i.e. $, $$, or $$$) were sourced from the Napa Countywide Transportation Plan, 2015

$$$ - high cost (>$1million); $$ - medium cost ($100k-$1million); $ - low cost (<$100k)
Source: Fehr & Peers, 2016

Supporting Programs and Policies

Key program and policy recommendations that complement the engineering-related projects are shown below in **Table N-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.

Downtown Napa: Dwight Murray Plaza

TABLE N-6: NAPA PROGRAM AND POLICY RECOMMENDATIONS	
Program or Policy	**Recommendations**
Education and Encouragement	
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 *Countywide Implementation* chapter of the countywide plan. Continue to seek funding for infrastructure projects that support safe routes to school.
Safety and Enforcement	
Law Enforcement for Pedestrian Safety	Coordinate with NVTA to provide resources for pedestrian safety principles/best practices and education outreach efforts. Consider working with the police department to designate 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 *Countywide Implementation* 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.
Maintenance	
Repair of Sidewalks, Crosswalks, and Curb Ramps	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 N-5, to complement the city's ADA Transition Plan and Sidewalk Maintenance program.
Overgrown Vegetation on Sidewalks and Planting Strips	Citywide, continue to ensure 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. Require adjacent property owners to maintain landscaped areas with live and healthy plant materials, replacing plant materials when necessary to maintain full function and aesthetics; to water, weed, prune, fertilize and keep sidewalks and planting strips litter free.
Engineering and Design Standards	
Crosswalk Guidelines	Consider adopting a local crosswalk policy to include criteria for appropriate locations to install crosswalk enhancements such as flashing beacons or advanced yield markings and conducting audits of current crosswalks for implementation, using nationally accepted best practices and recent research.
Place Making and Complete Streets	
Site Plan Review Checklist	Continue to encourage pedestrian friendly design and connectivity.

Next Steps

Funding Sources

Sidewalk projects in Napa are funded through the Capital Improvement Program (CIP) and the sidewalk maintenance program, which has an annual funding level of approximately $1,500,000. This program includes maintaining curb ramps, repairing tree damage, and constructing missing sections of sidewalk. The city coordinates efforts for their 10-mile repaving program with sidewalk repair projects to combine resources if possible. Additionally, Napa was awarded $75,000 for installation of in-pavement lighted crosswalks near schools, funded by a Transportation Development Act Arcticle-3 (TDA-3) Grant in February 2010.

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 December 2015. 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 Napa through Caltrans, the Metropolitan Transportation Commission (MTC), and the Napa Valley Transportation Authority (NVTA).

Table N-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 C** 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 N-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

Typical costs for pedestrian treatments and projects vary by type and location. Construction costs include costs for engineering, design, environmental, construction management, mobilization, traffic control, construction and right-of-way. Costs to maintain the pedestrian network include costs for on-going maintenance and replacement.

Examples of low cost pedestrian improvements ($10,000 - $100,000) are those that are implemented as spot improvements, and generally include signing and striping, individual curb extensions or refuge islands, and rectangular rapid flashing beacons (RRFBs). More robust improvements such as Pedestrian Hybrid Beacons and minor sidewalk gap closure projects can generally be classified as medium cost projects ($100,000 - $1,000,000), while most corridor projects such as sidewalks, pedestrian-scale lighting, and traffic control improvements or large infrastructure projects such as pedestrian overpasses are generally higher cost (greater than $1,000,000). Substantial drainage and utility modifications can increase the cost of any given project.

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.

Napa Appendix

N-A Benchmarking Table

N-B Existing Pedestrian Policies

N-C Detailed Project Lists and Evaluation Criteria

N-D Plan Adoption Resolution

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

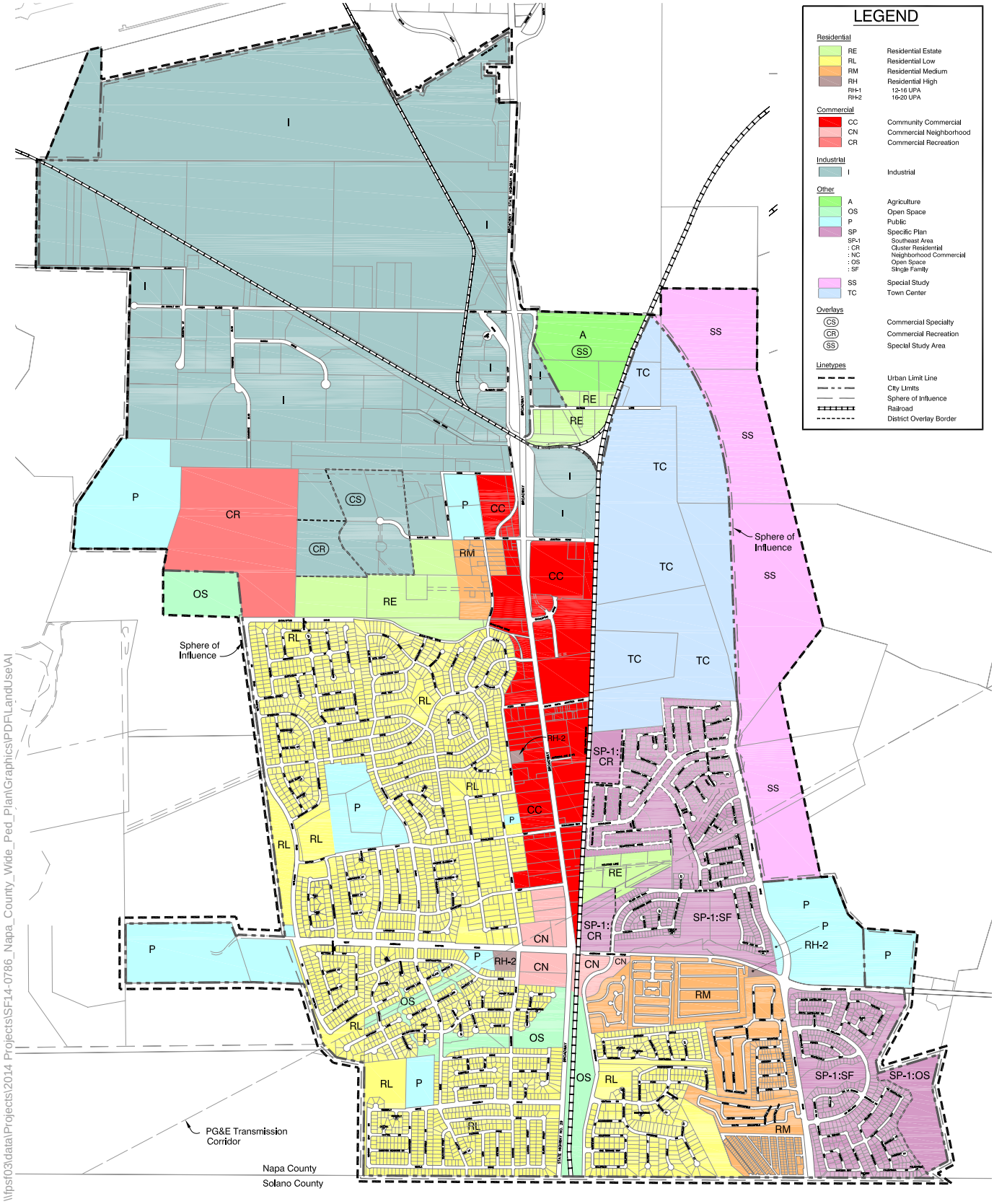
To help guide the development of key programs and policies for this Plan, American Canyon's existing approaches to facilitating and enhancing walking were reviewed with a benchmarking matrix that compares the existing programs, policies, and practices with national best practices. The benchmarking analysis 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**
Key Strengths		
ADA Transition Plan 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. An ADA Transition Plan sets forth the process for bringing public facilities into compliance with ADA regulations.	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. The city uses Caltrans standard drawings for curb ramps which include tactile grooves; however, they do not include truncated domes or directional curb ramps.	• Consider tracking ADA improvements using practices recommended in the ADA Transition Plan 2015 update, to be implemented by the ADA Coordinator • Implement directional curb ramps where practical and truncated domes in all cases. Review and revise standard drawings to align with PROWAG recommendations.
Traffic Calming Program 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.	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.	• 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. • Encourage the routine use of traffic calming measures beyond speed humps.
Public Involvement 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.	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.	• 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. • 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. • Consider organizing neighborhood groups that identify street needs, including greening and traffic calming.
Key Opportunities		
Collision Reporting 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).	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.	• 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. • 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.

TABLE AC-1: AMERICAN CANYON BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**American Canyon Current Practice**	**Best Practice Examples**
Inventory of Pedestrian Facilities A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc.	The city does not have a GIS inventory of sidewalks or other pedestrian facilities. 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.	• Expand the GIS-based facility inventory, created as part of this plan, to include informal pathways and key pedestrian opportunity areas in the City.
Walking Audit Program 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.	American Canyon has not conducted pedestrian walking audits before this plan.	• 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.
Crosswalk Design Guidelines A formal policy for crosswalk installation, removal, and enhancement provides transparency in decision-making and creates a consistent application of treatments citywide.	The city currently does not have a crosswalk policy and makes decisions regarding crosswalks on a case by case basis.	• 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. • Include criteria in the crosswalk policy for identifying, installing, and enhancing midblock crossings where strong desire lines exist.



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.

Exhibit AC-2

American Canyon - Destination Map

Existing Pedestrian Infrastructure

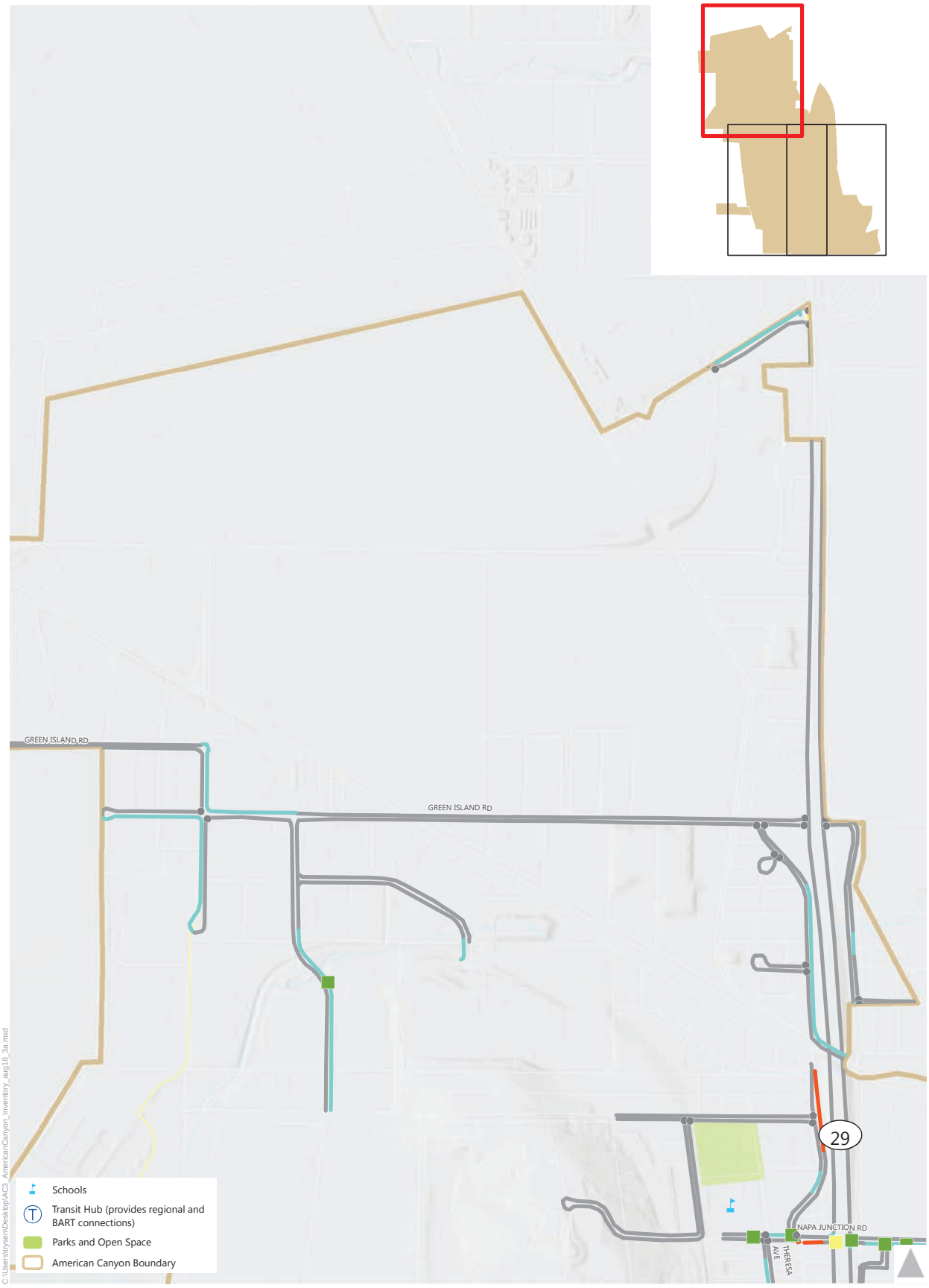
An inventory of existing sidewalks, marked crosswalks, curb ramps and trails was collected on key roadways throughout the city using a combination of aerial imagery and Google Street View imagery from the years 2011 – 2014 (imagery for a few small residential streets dated back to 2007).

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



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

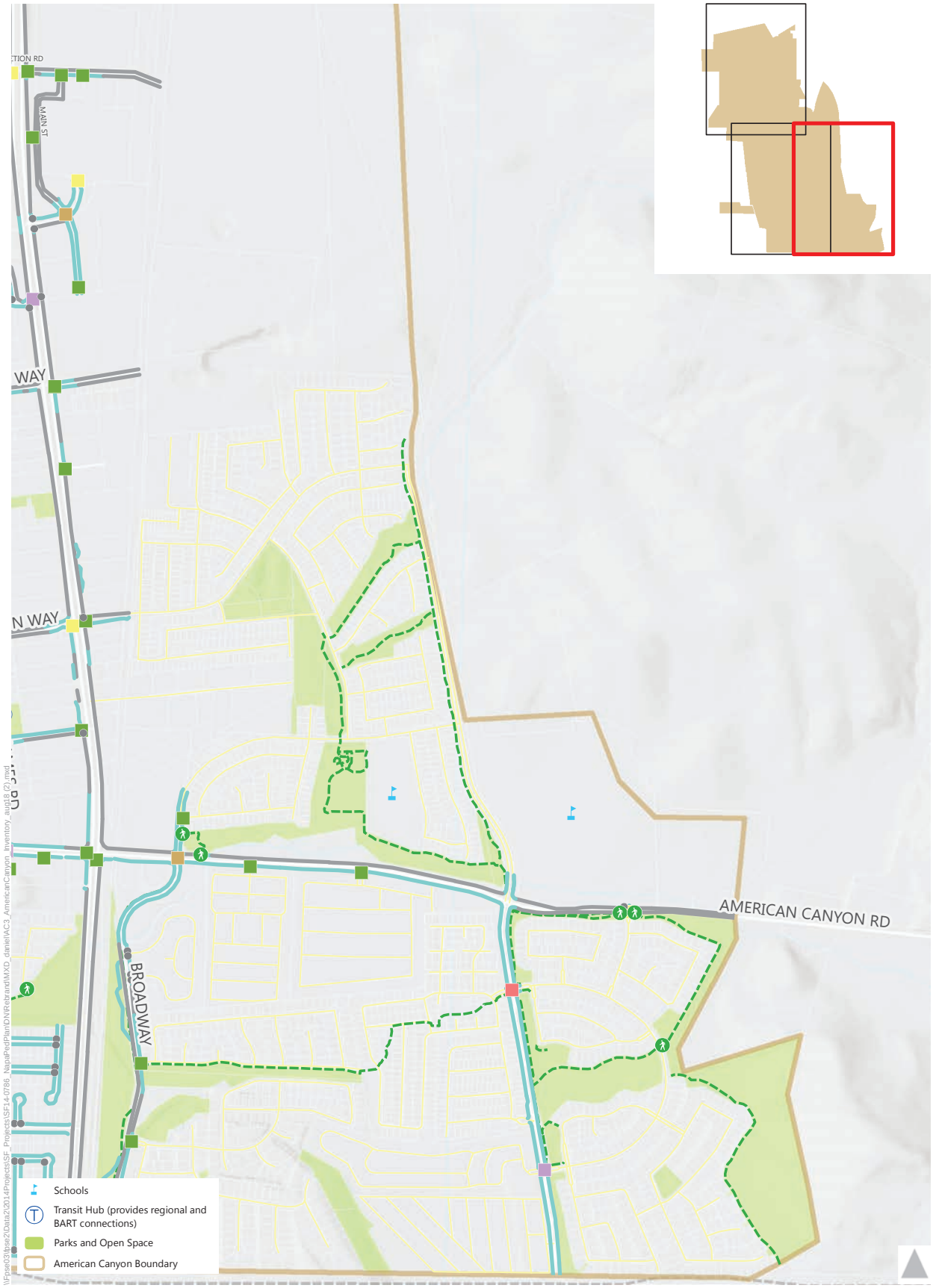
Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4

- Missing Curb Ramp
- Roads not Surveyed

0 0.25 0.5 Mile

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



Pedestrian Inventory

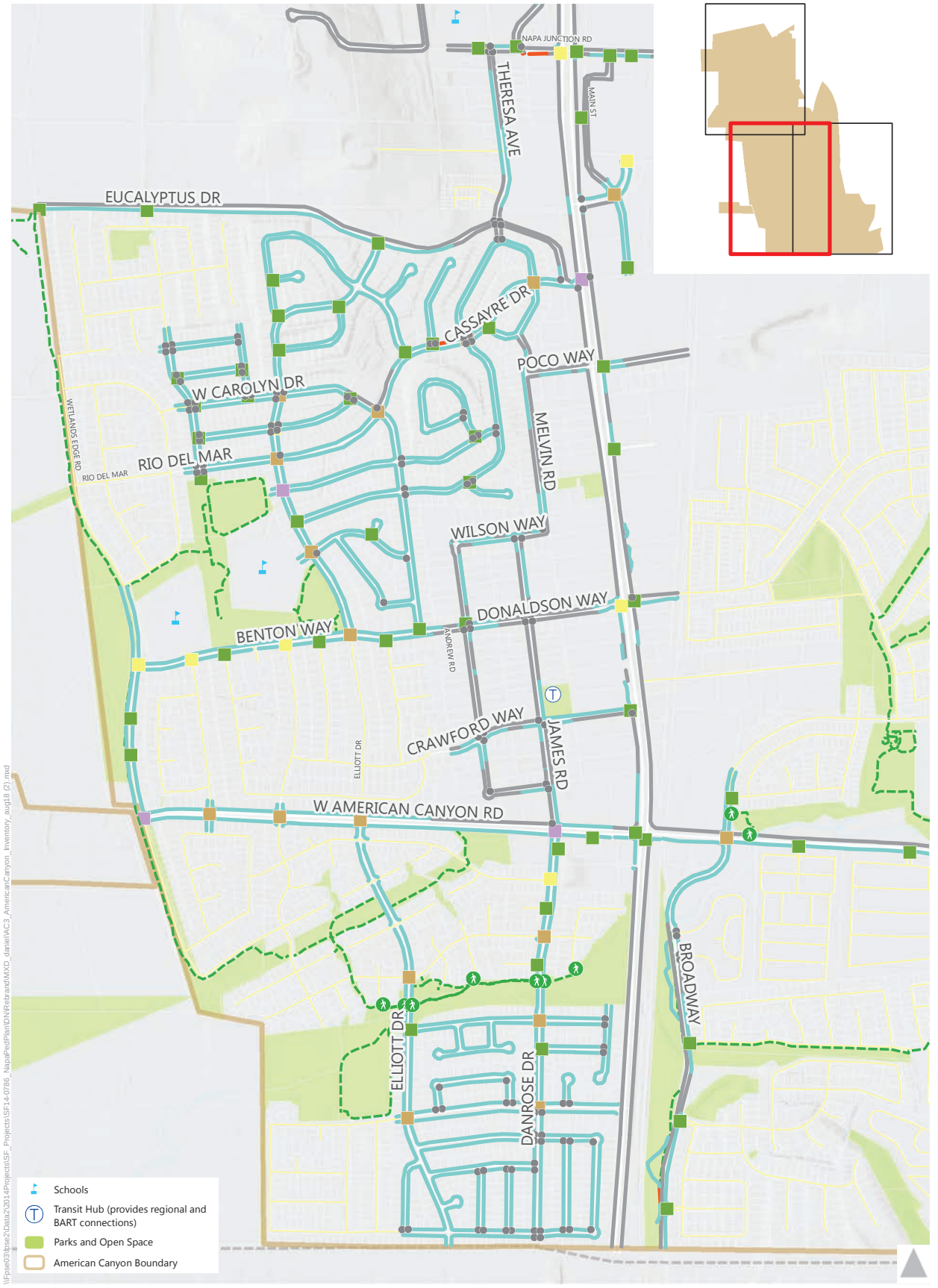
Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4

- Missing Curb Ramp
- Trail Crossings
- Roads not Surveyed

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



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4

- Missing Curb Ramp
- Trail Crossings
- Roads not Surveyed

0 0.25 0.5 Mile

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

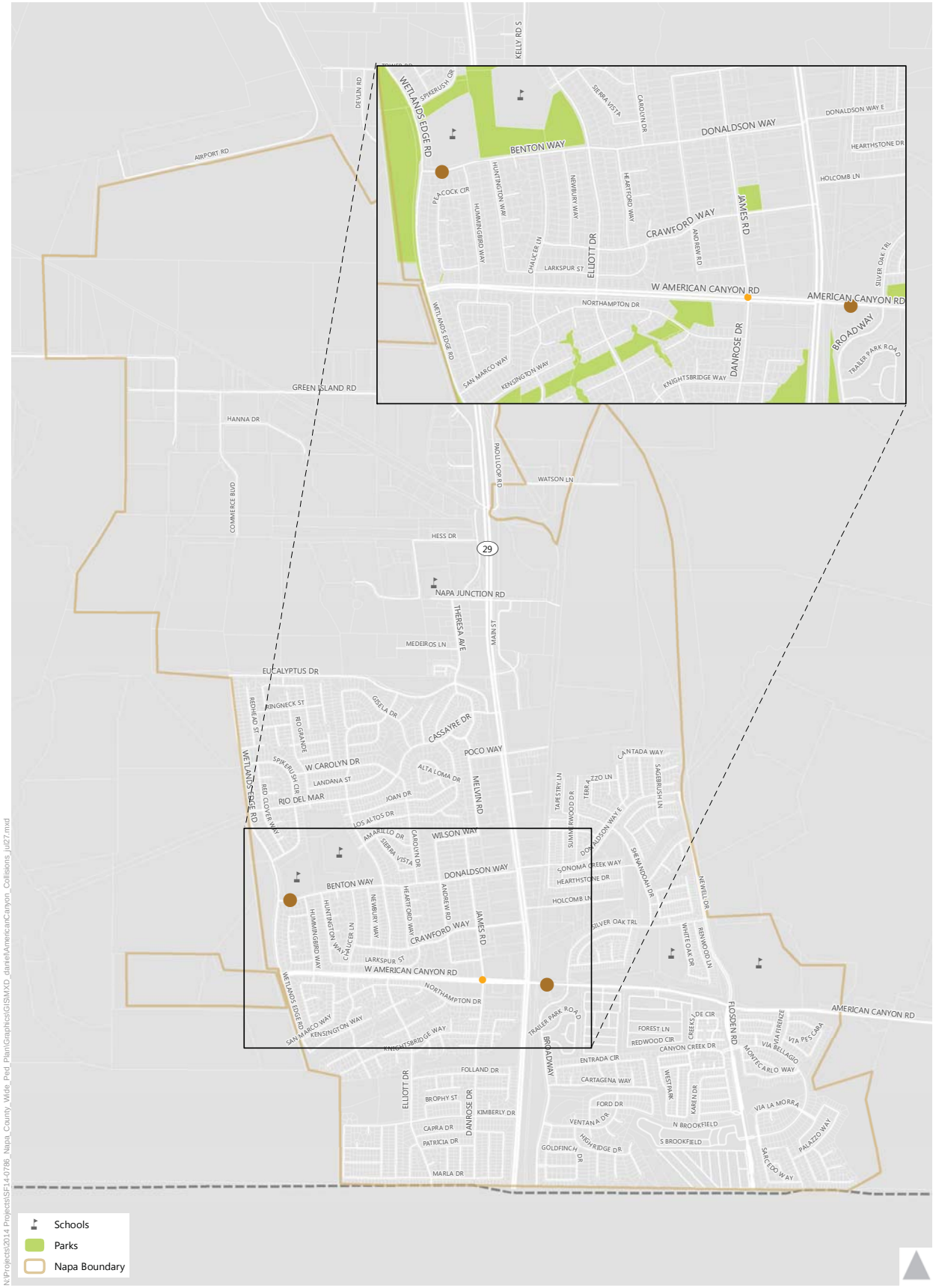
Perhaps one of the more telling sources of information in the SWITRS data is the Pedestrian Action variable, which describes what the pedestrian was doing immediately before the collision occurred. According to the pedestrian actions presented in **Table AC-3**, pedestrian safety issues surrounding collisions 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[1]
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



Pedestrian-Involved Collisions 2003-2012

- 1 # of Injury Collisions
- 2

Pedestrian Collision Hotspots

Density	Intersection	Total Collisions
●	American Canyon Rd. and James Rd.	1
●	Benton Way and Wetlands Edge Rd.	2
●	Broadway and American Canyon Rd.	2

None of these intersections experienced a fatal collision.

0 0.5 1 Mile

Exhibit AC-4
Pedestrian-Involved Collisions
2003 - 2012 City of American Canyon

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.

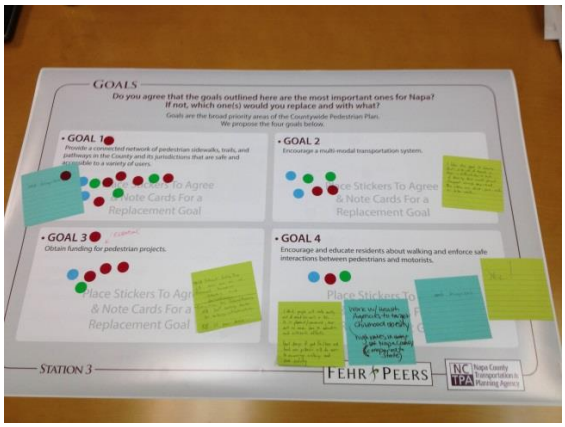
Public workshops were held throughout the County in Winter 2015: in Napa on January 22 at NVTA; in American Canyon on January 27; in St. Helena on January 28; and in American Canyon on February 4. Due to recent public workshops held in Calistoga through development of their Active Transportation Plan 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**

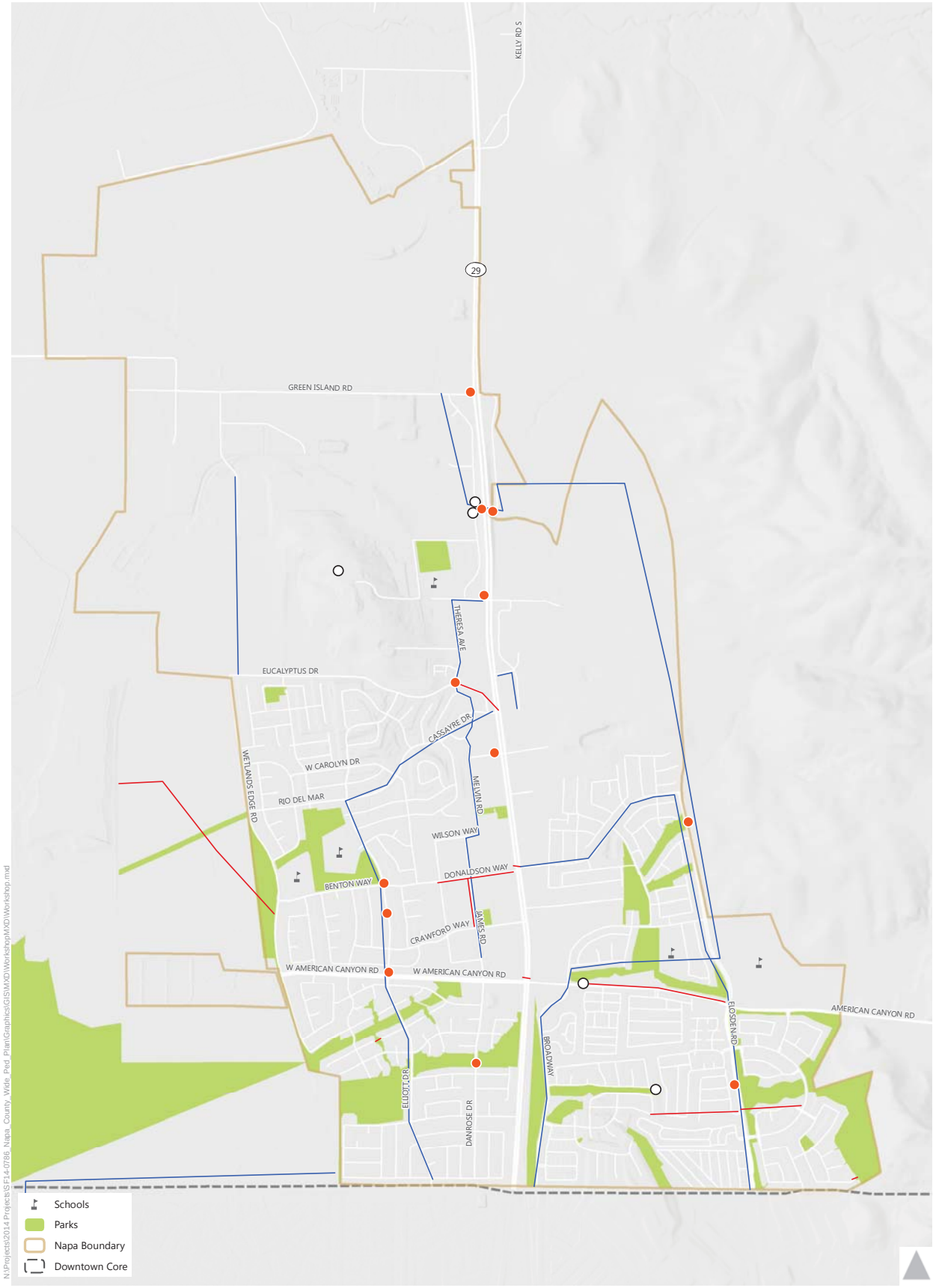
  At Station One, participants voted on a list of common barriers to walking to indicate those that were most relevant to the walking environment in their jurisdiction and countywide. Participants also wrote comments on large-scale aerial maps placed on tables or on the floor to highlight existing barriers 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.
- **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.



Safety
Maintenance
ADA
Other
Sidewalk/Pathway
Other

0 0.5 1 Mile

Exhibit AC-5

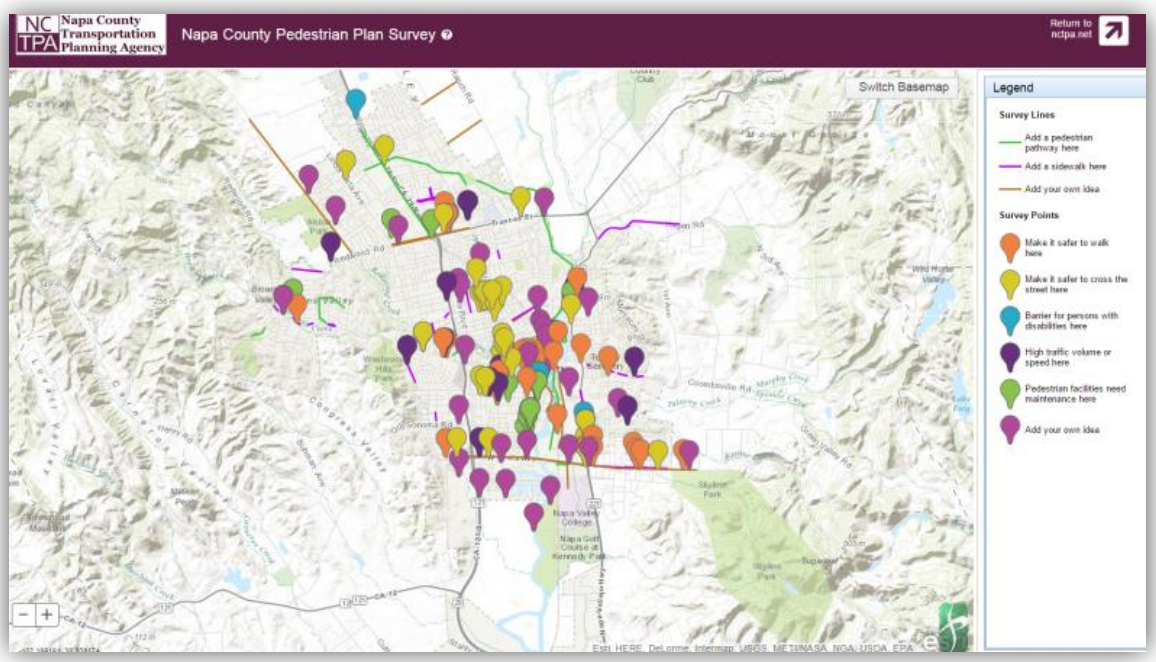
Workshop Comments
American Canyon

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.

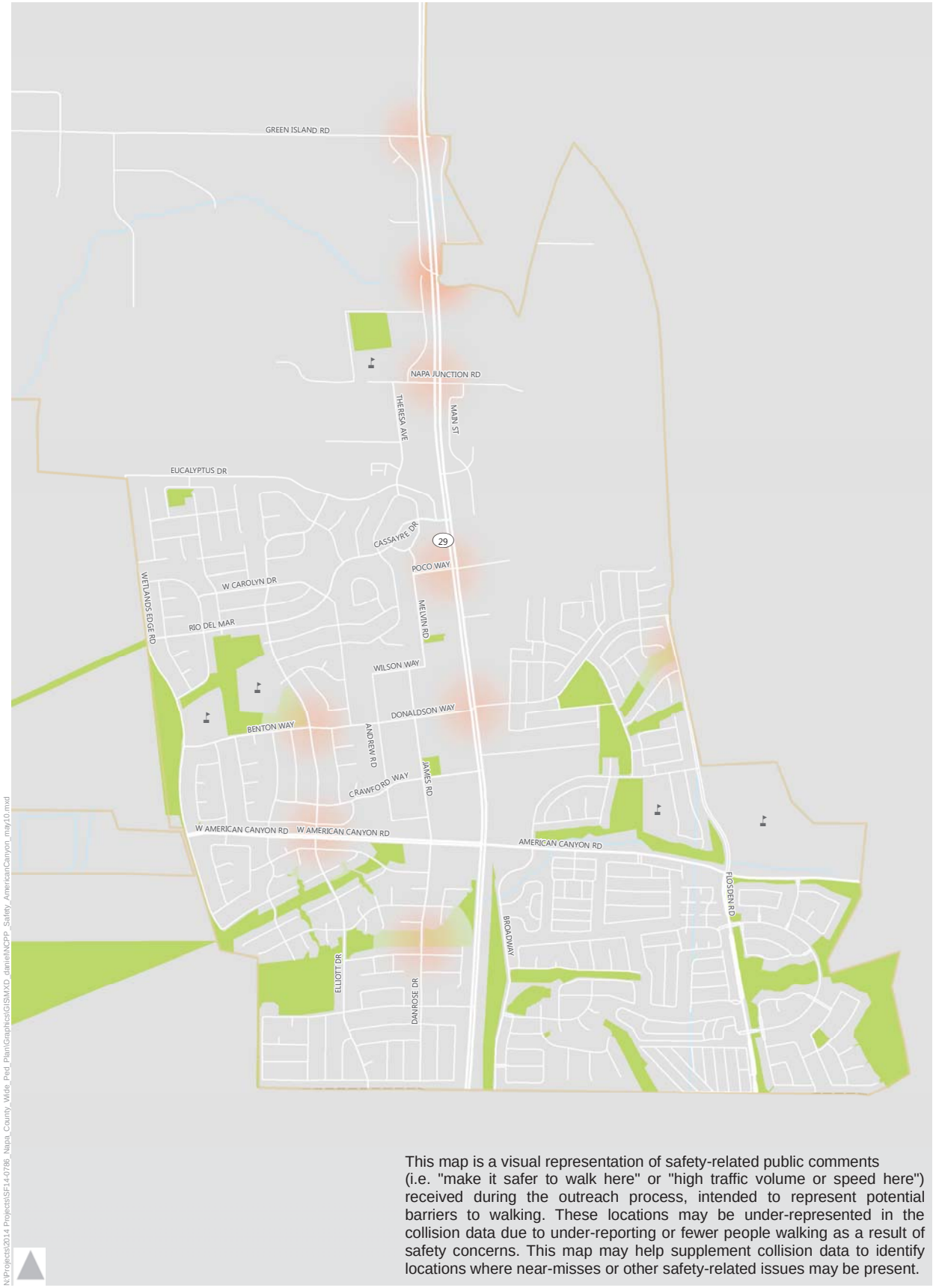
Key goals for the pedestrian planning process were also discussed with American Canyon staff and included creating a sidewalk maintenance policy and updating the ADA Transition Plan. These goals are incorporated into key programmatic and policy recommendations in this plan.

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[6] 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.

[6] 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



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.

N:\Projects\2014 Projects\SF14-0786_Napa_County_Wide_Ped_Plan\Graphics\GIS\MXD_daniel\NCPP_Safety_AmericanCanyon_may10.mxd

Schools

Parks

American Canyon Boundary

Safety-Related Comments

Many Issues (2) ← Few Issues (0)

0 0.5 1 M

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.

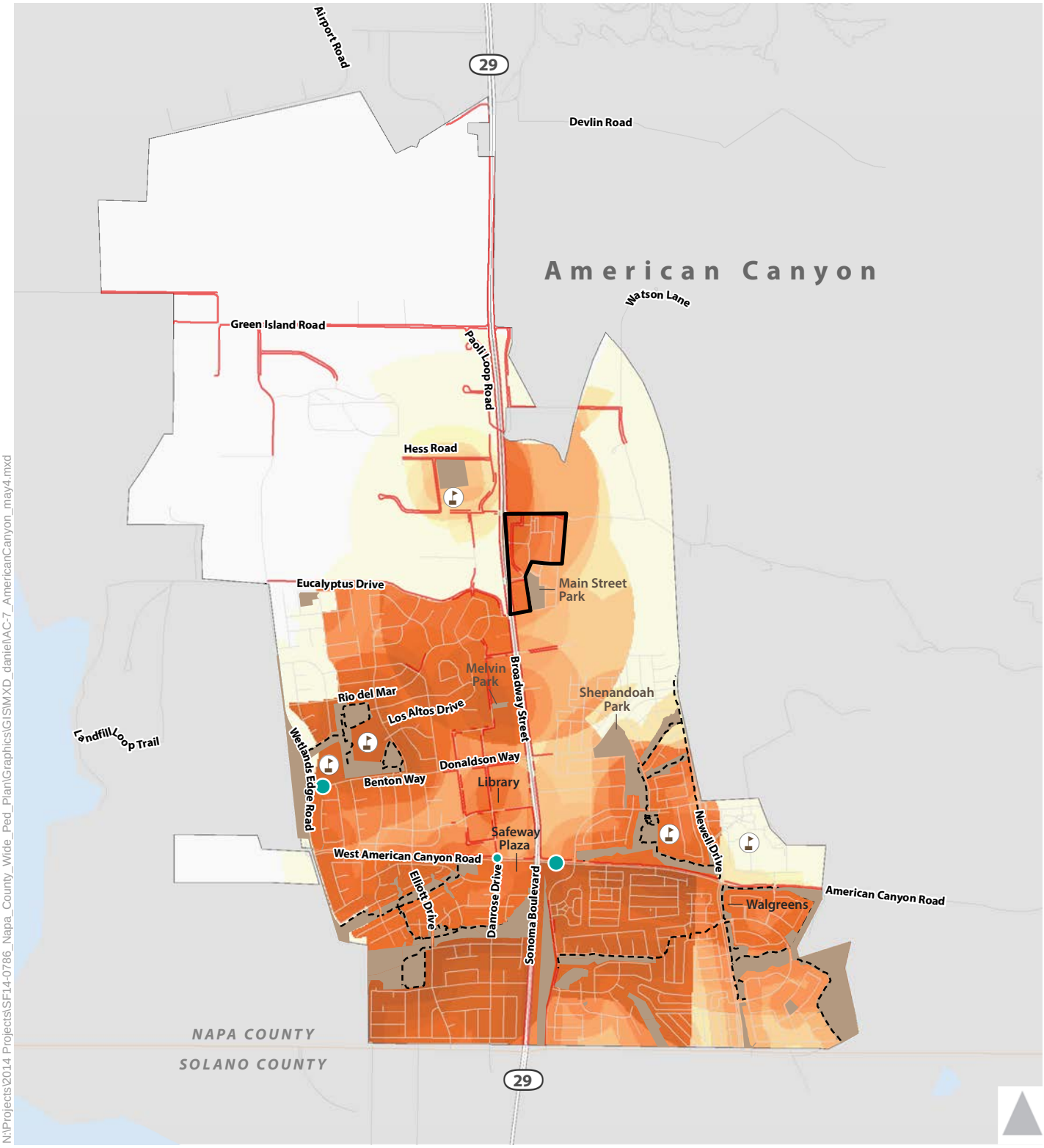
- **Eastern Routes to School:** American Canyon Road from Newell Drive to Danrose Drive; James Road from American Canyon Road to Crawford Way (1 mile)
  Several comments during the workshop highlighted the lack of sidewalk along American Canyon Road, a key connection to the high school. Several pedestrian 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

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1 2

Pedestrian Fatality

Missing Sidewalks

Legend:

Major Retail

Parks

Trail/Path

School

Exhibit AC-7

American Canyon - Pedestrian Index Demand & Deficiencies

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.*

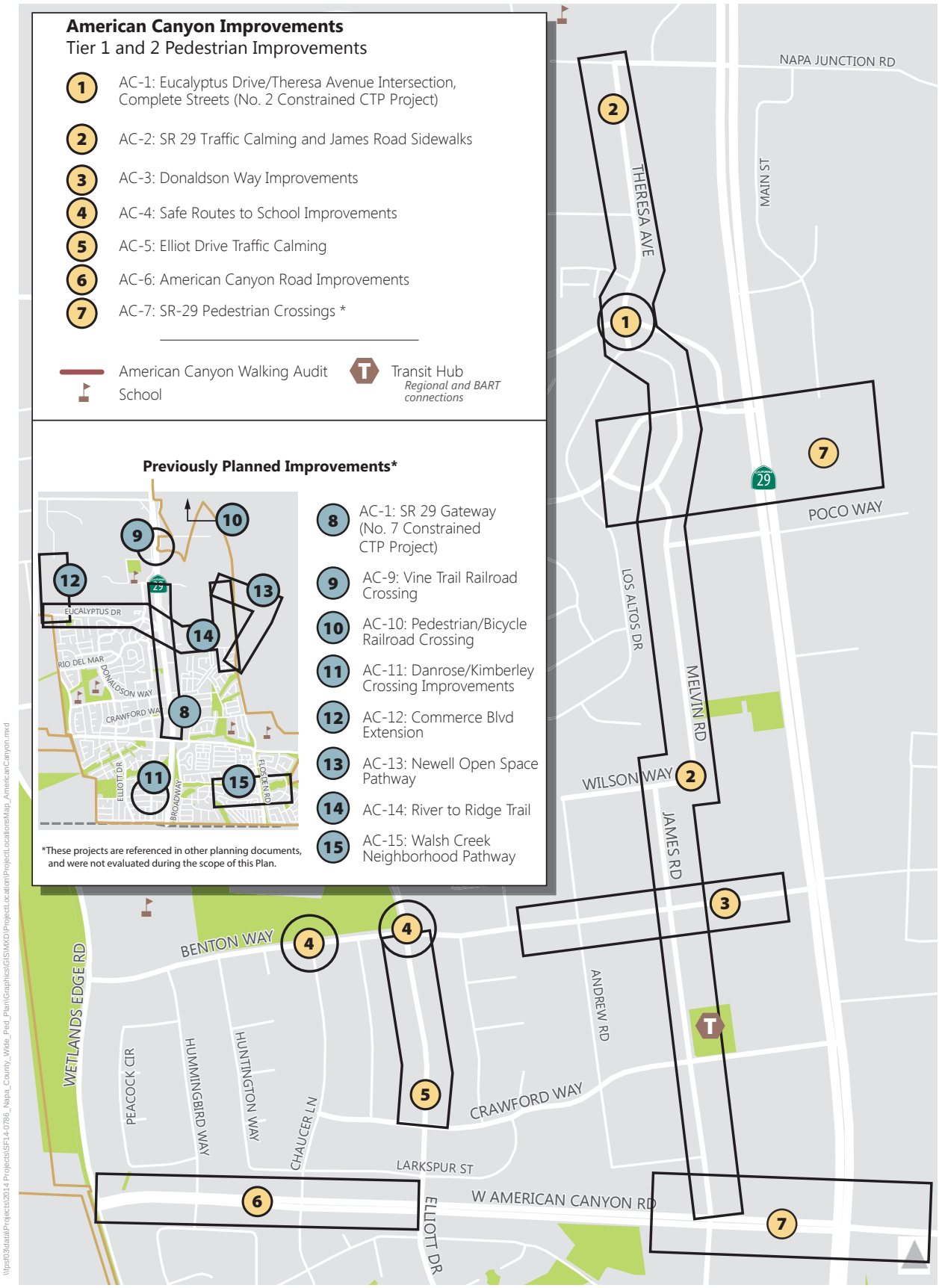


Exhibit AC-8

American Canyon - Project Locations

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**
ON-GOING SYSTEM MAINTENANCE				
Sidewalk Gap Closure and Maintenance (No. 1 2015 CTP Program)	Citywide	Sidewalk maintenance, rehabilitation and expansion	Sidewalks Maintenance	$$$
TIER ONE				
AC-2 SR 29 Traffic Calming and James Road Sidewalks	James Road, Melvin Road, Cassavre Drive, Theresa Avenue	Traffic calming study	Traffic calming	$1,035,000
	James Road, Donaldson Way to American Canyon Road	Near Term: Sidewalk installation	Sidewalks	
		Medium-Term: Sidewalk installation	Sidewalks	
		Long-Term: Sidewalk installation	Sidewalks	
AC-3 Donaldson Way Improvements	Donaldson Way, SR 29 to James Road	Sidewalk	Sidewalk	$570,900
	Donaldson Way, James Road to Andrew Road	Tree trimming	Maintenance	
	Donaldson Way at Andrew Road	Marked crosswalks	Crossing treatments	
	Donaldson Way, Carolyn Drive to Andrew Road	Sidewalks	Sidewalk	
AC-4 Safe Routes to School Improvements	Donaldson Way at Elliott Drive	Roundabout and relocated bus stop	Traffic calming Crossing treatments	$356,600
	Benton Way at Chaucer Lane	Crosswalk enhancements[1]	Crossing treatments	
AC-7 SR 29 Pedestrian Crossings[2]	SR 29 at American Canyon Road and Rio Del Mar	Grade-separated pedestrian crossings	Crossing treatments	$$$
TIER TWO				
AC-1 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
AC-5 Elliot Drive Traffic Calming	Elliot Drive from Donaldson Way to Crawford Way	Neck downs with bicycle access	Traffic calming	$$
		Signage	Signing and striping	
	Elliot Drive at Crawford Way	Traffic circle with enhanced[1] marked crosswalk	Traffic calming Crossing treatments	
	Elliot Drive at Larkspur Street	Traffic circle	Traffic calming	
	Elliot Drive from Larkspur Street to American Canyon Road	Raised median with restriping and relocated bus stop	Crossing treatments Transit	
AC-6 American Canyon Road Improvements	American Canyon Road at Elliot Drive	Near Term: Crosswalk enhancements[1]	Crossing treatments ADA ramps	$$
	West of Elliot Drive	Long Term: Feasibility study for linear park	Pathway Traffic calming	
PREVIOUSLY PLANNED IMPROVEMENTS[4]				
AC-8 SR 29 Gateway (No. 7 CTP Constrained Project list)	SR 29, American Canyon Road to Napa Junction Road	Pathway, enhanced crosswalks[1], Class I pathway and Class IV bikeways	Sidewalks Crossing Treatments Pathway	$$$
	SR 29 at Donaldson Way	Crosswalk enhancements[1]	Crossing treatments ADA ramps	
AC-9 Vine Trail Railroad Crossing[3]	SR 29 at Paoli Loop Road	Grade-separated Vine Trail crossing	Crossing treatments	$$$
AC-10 Pedestrian/Bicycle Railroad Crossing[3]	Railroad tracks east of SR 29 near proposed "Town Center"	Grade-separated pedestrian crossing	Crossing treatments	$$$
AC-11 Danrose / Kimberly Crossing Improvements[3]	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
AC-12 Commerce Boulevard Extension[3]	Commerce Boulevard, from Eucalyptus Drive to southern terminus of Commerce Boulevard	Multi-use path	Pathway	$$
AC-13 Newell Open Space Pathway[3]	Newell Creek, Newell Open Space Entrance at Newell Drive through Newell Open Space	River to Ridge multi-use path connection	Pathway	$$$
AC-14 River to Ridge Trail[3]	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	$$$
AC-15 Walsh Creek Neighborhood Pathway[3]	Walsh Creek, from Cartagena Way to Via Bellagio	Multi-use path and pedestrian bridge	Pathway	$$$

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
Education and Encouragement	
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 *Countywide Implementation* chapter of the countywide plan.
Safety and Enforcement	
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 *Countywide Implementation* 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.
Maintenance	
Repair of Sidewalks, Crosswalks, and Curb Ramps	• 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. • 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.

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.
Engineering and Design Standards	
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.
Place Making and Complete Streets	
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: http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf

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[1]**
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

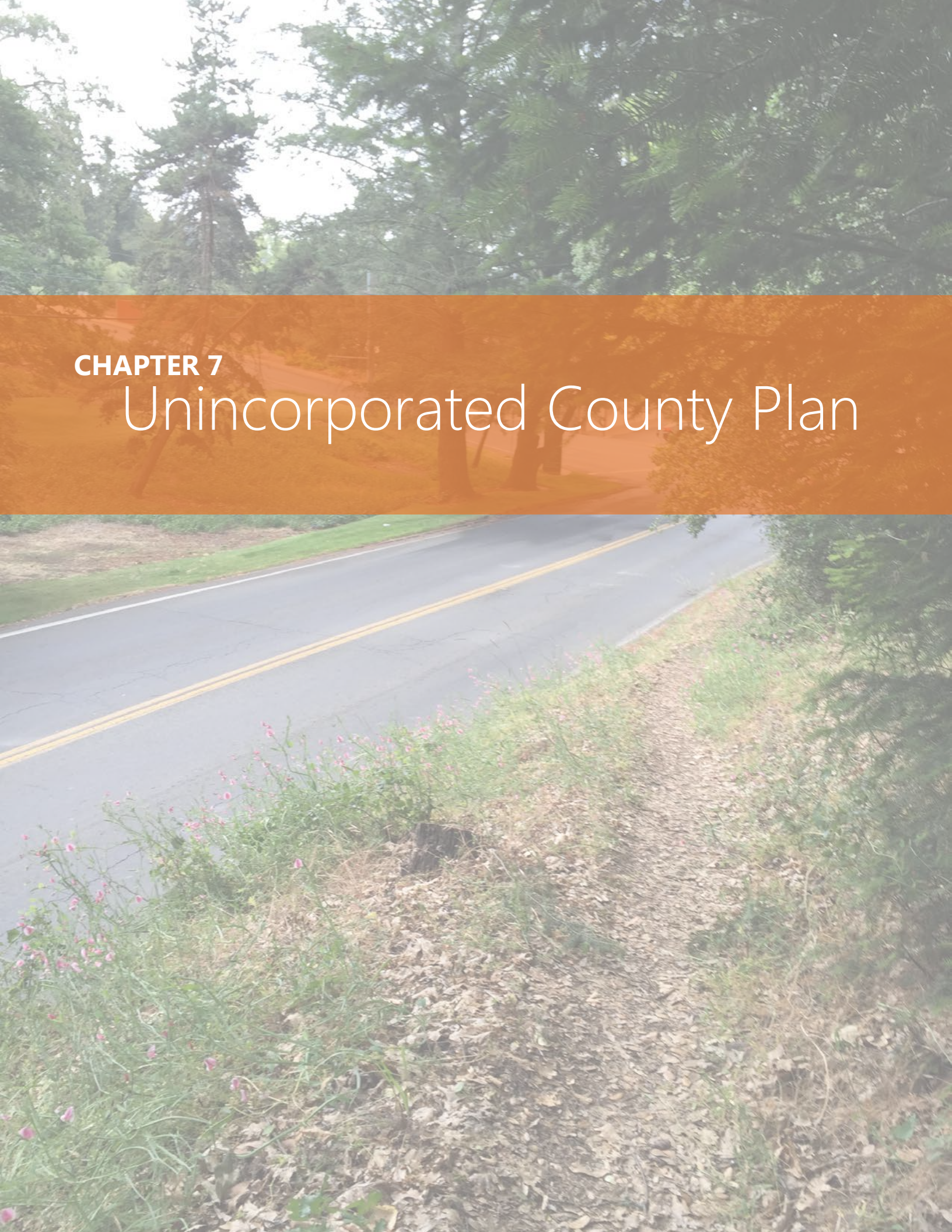
AC-A Benchmarking Table

AC-B Existing Pedestrian Policies

AC-C Detailed Project Lists and Prioritization

AC-D Cost Estimates

AC-E Plan Adoption Resolution



CHAPTER 7

Unincorporated County Plan

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Chapter 7
Unincorporated Plan

Pedestrian Setting

The unincorporated areas of Napa County provide a cherished rural setting for residents and visitors with open vistas of vineyards and the surrounding landscape. Residents primarily travel by car due to their remote location and the distances between pockets of development; however, pedestrian trips frequently occur within the rural community centers such as Angwin, Oakville, Rutherford, and Oak Knoll. Pedestrian trips are also concentrated near the borders of incorporated jurisdictions to connect hotels or residential uses to local grocery stores, wineries, schools or transit stops. The Unincorporated County has several developed trail systems. Neighborhood streets typically do not have sidewalks and few intersections currently have marked crosswalks. Land use patterns for the County are shown in *Exhibit UNC-1* and a map of all the wineries countywide is shown in *Exhibit UNC-2*.

Existing Policies and Programs

To help guide the development of key programs and policies for this plan, the Unincorporated County'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 UNC-1**, the County of Napa, which has jurisdiction over the unincorporated areas, is interested in investing in pedestrian accommodations and excels in such areas as collision reporting, coordination with health agencies, and transportation demand management. This plan provides a framework for investments in accessibility improvements as well as context-appropriate design standards for pedestrian facilities on rural roadways. Other areas of opportunity that this plan addresses directly are the collection of pedestrian volumes, inventory of pedestrian facilities, and crosswalk design guidelines. The full benchmarking analysis for the Unincorporated County, with associated recommendations, is presented in **Appendix UNC-A**.

TABLE UNC-1: UNINCORPORATED COUNTY BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Unincorporated County Current Practice**	**Best Practice Examples**
Key Strengths		
Collision Reporting 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).	Collisions are geo-coded (mapped), reviewed, and monitored for recurring patterns by county staff.	• Expand monitoring practices to include collision typing for countermeasure selection could allow for more proactive pedestrian safety projects. • 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 funding. Volunteers can collect pedestrian volumes and other data at collision locations.
Transportation Demand Management 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.	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.	• Implement education strategies that collaborate with local hotels to support the "Car Free" tourism program of the Napa Valley Destination Council, to provide wayfinding, shuttle, and transit information to visitors so they can plan a trip without relying solely on a car. Prioritize improved access to transit in the unincorporated areas as part of these efforts.
Coordination with Health Agencies 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.[7]	Live Healthy Napa County, a coalition of community stakeholders for improving health in Napa County, recently completed the countywide program Napa County Community Health Improvement Plan (CHIP) in February 2014. The document proposes a plan to address health issues through new countywide policies and health promotion strategies, including transportation policies that encourage walking and biking. Live Healthy Napa County is also working to complete the first ever Napa County Community Obesity Prevention Plan, which addresses the need to increase active transportation options countywide.	• Seek opportunities to include sidewalk projects and other pedestrian improvements in the unincorporated areas through the County's Capital Improvement Program to align with goals in the CHIP for improving the built environment to encourage active transportation. • Ensure consistency with the CHIP by seeking partnership opportunities between County health agencies and SRTS to expand the reach of education and promotion of walking in the unincorporated areas.

[7]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

TABLE UNC-1: UNINCORPORATED COUNTY BENCHMARKING HIGHLIGHTS		
Plans, Policies, & Programs	**Unincorporated County Current Practice**	**Best Practice Examples**
Key Opportunities		
Inventory of Pedestrian Facilities A GIS-based sidewalk inventory enables project identification and prioritization, as well as project coordination with new development, roadway resurfacing, etc.	The unincorporated County maintains a countywide GIS database, but it does not include pedestrian facilities.	• Maintain the GIS facility database created by this plan by updating the inventory as facilities are added or changed and to the extent that staff has local knowledge, expand inventory to areas outside of initial 50 miles. • Expand the GIS sidewalk inventory to include informal pathways and potential pedestrian opportunity areas in the County.
Pedestrian Volumes Pedestrian volume data is important for prioritizing projects, developing collision rates, and determining appropriate pedestrian infrastructure.	The County of Napa does not collect pedestrian volumes as a matter of routine.	• Routinely collect pedestrian volumes with all transportation impact studies (TIAs). • Use collected pedestrian volumes from this plan to identify pedestrian nodes in the next update to the General Plan. • Consider using volumes for collision monitoring and justification for pedestrian improvements.
Crosswalk Design Guidelines A formal policy for crosswalk installation, removal, and enhancement provides transparency in decision-making and creates a consistent application of treatments citywide.	The County uses the MUTCD warrants for decisions on placing crosswalks. Crosswalks are not always placed on all approaches of signalized intersections.	• Consider adopting a crosswalk policy as part of this plan that reflects best practices and recent research to include criteria for appropriate locations to install crosswalk enhancements such as flashing beacons, advanced yield markings, or in-roadway pedestrian signs. • Include criteria in the cross walk policy for identifying, installing, and enhancing crossings where strong desire lines exist, especially near transit stops in the County.

Notes:

1. 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

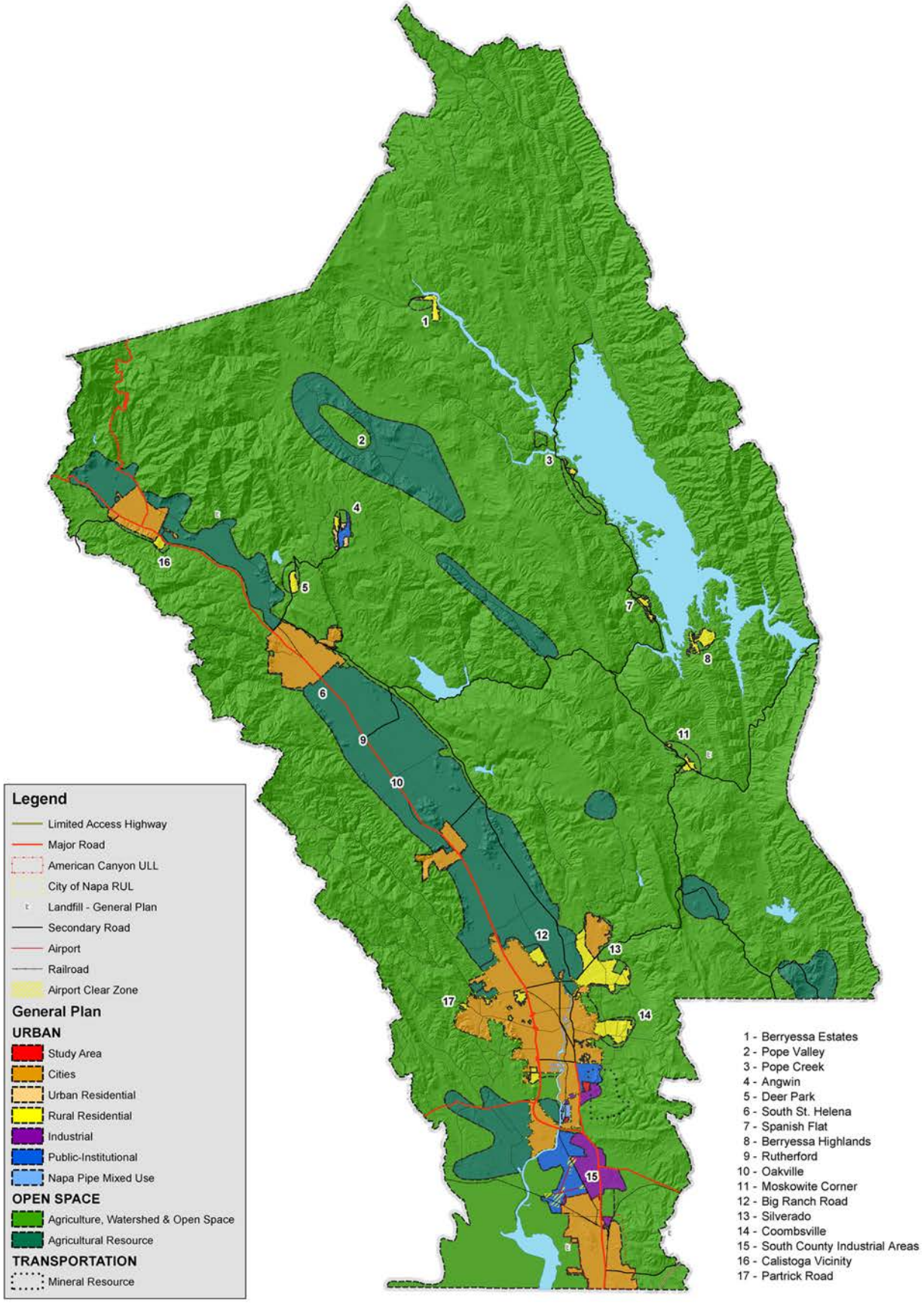

Exhibit UNC-1

Unincorporated - Land Use Map

Source: "Wineries of The Legendary Napa Valley".

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Exhibit UNC-2

County Wide - Destination Map

Existing Pedestrian Infrastructure

An inventory of existing sidewalks, marked crosswalks, curb ramps and trails was collected on key roadways throughout the County 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).

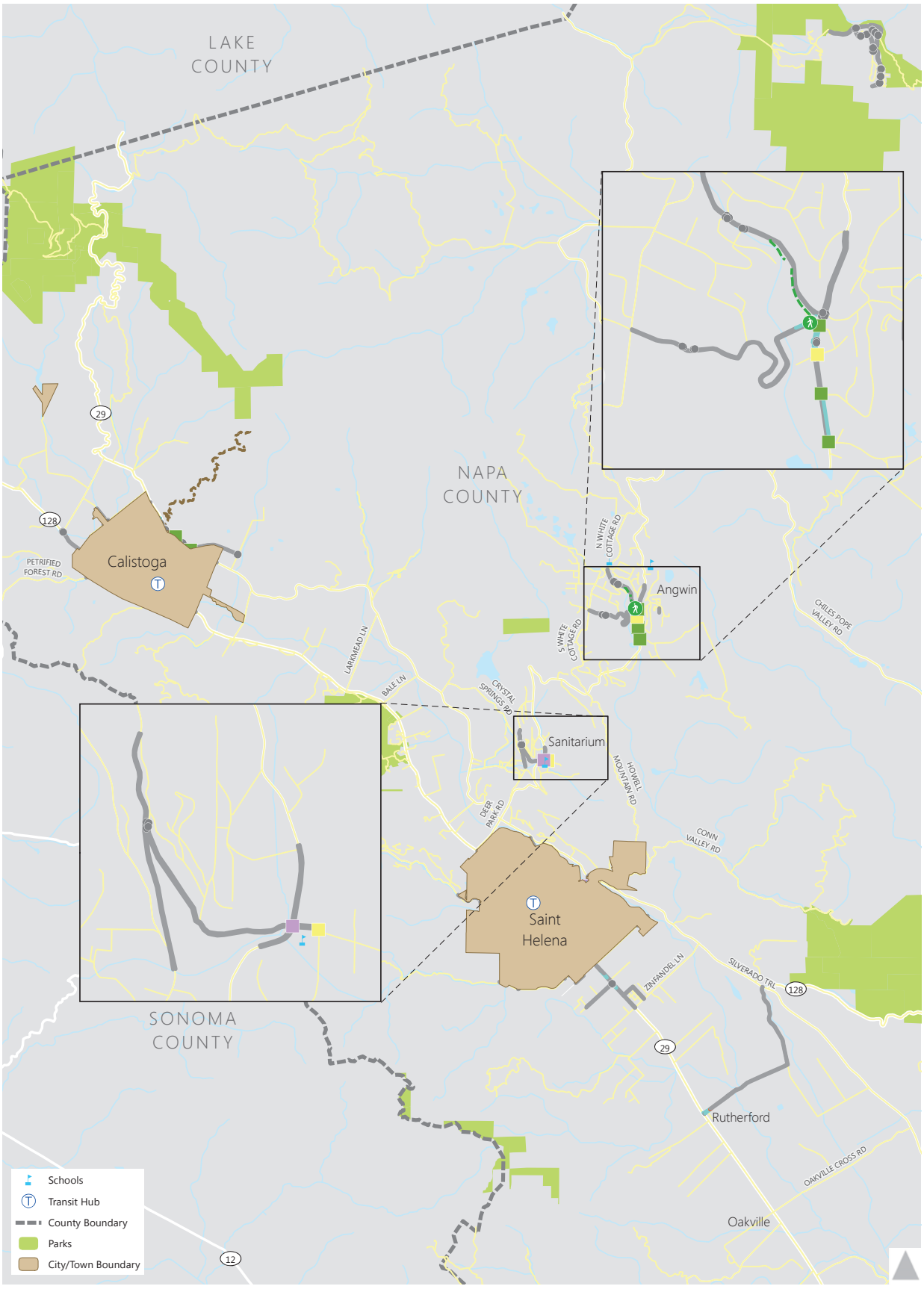
A GIS database assembled for the inventory includes additional detail beyond what is illustrated in the inventory maps, including the style of crosswalk striping, the method of vehicle control at the crosswalk (i.e., traffic signal, flashing beacon, stop sign, or uncontrolled), whether the crosswalk 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.

Unincorporated County Inventory

A roadway network of 56 miles in the Unincorporated County was identified by County staff for data collection. The following were key considerations in choosing the final inventory network:

- Within a ¼ to ½ mile radius around key destinations (schools and retail nodes)
- Location of pedestrian collisions
- Location of bus stops

As shown in Exhibit UNC-3, most of the inventory network for the Unincorporated County lacks sidewalk coverage. A few marked crosswalks and curb ramps exist near small pockets of development.



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

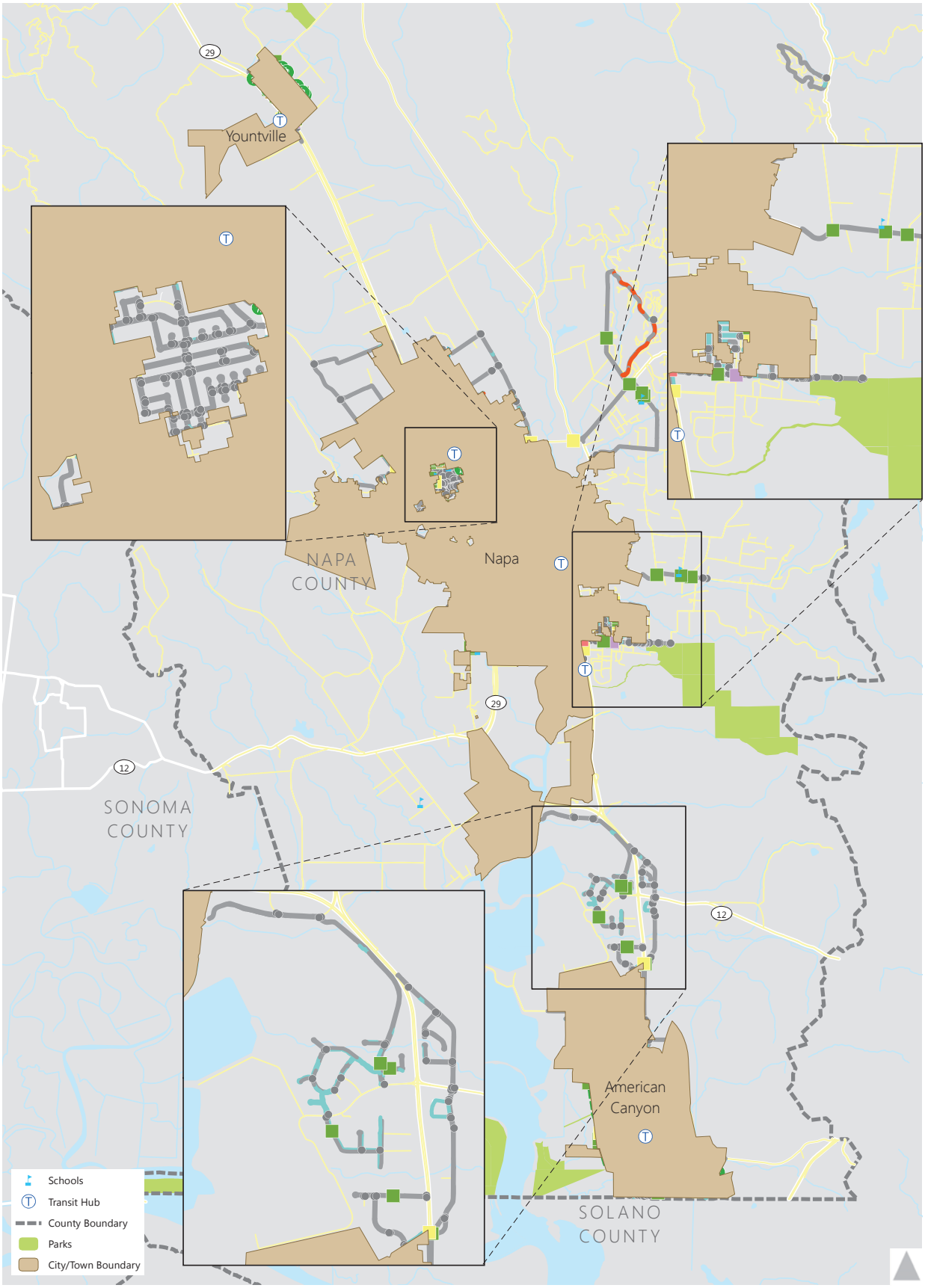
Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings
- Roads not Surveyed

0 2 4 Miles

Exhibit UNC-3a
Pedestrian Facility Inventory
Unincorporated Napa County
North County



Pedestrian Inventory

Sidewalks
- Asphalt
- Existing
- Missing

Trails
- Paved Multi-Use Trail
- Unpaved Trail

Crosswalks
- 1
- 2
- 3
- 4
- 5
- 8

- Missing Curb Ramp
- Trail Crossings
- Roads not Surveyed

0 2 4 Miles

Exhibit UNC-3b
Pedestrian Facility Inventory
Unincorporated Napa County
South County

Activity Levels

Pedestrian counts were conducted at three locations in Angwin, the highest populated community in the unincorporated area, 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 UNC-2** provides a summary of the two-hour counts completed within the jurisdiction. Count results varied significantly based on the adjacent land use.

TABLE UNC-2: ANGWIN COUNT PROGRAM LOCATIONS

ID	Jurisdiction	Location	Morning	Evening	School
			7-9AM	4-6PM	2-4PM
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

The three intersections observed within the unincorporated community of Angwin were all unsignalized intersections with limited crosswalks and sidewalks on the intersection approaches. The highest level of pedestrian activity observed in Angwin was at the intersection of Brookside Drive and Howell Mountain Road (UNC1), adjacent to Pacific Union College and Pacific Union College Preparatory High School.

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 UNC-4 shows the locations of these pedestrian collisions in the Unincorporated County.

Exhibit UNC-4 presents raw collision counts only. While this is illustrative of “hot spot” areas in the Unincorporated County, 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

The majority of collisions in the unincorporated County occurred near areas of development, especially near the border of the City of Napa. While unincorporated County areas do not have distinct “hot spots” (collision locations

where more than one collision occurred over the last 10 years), more than one fatality did occur along the same corridor. As shown in *Exhibit UNC-4*, two fatalities occurred each on Silverado Trail and SR 29 over this time period.

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

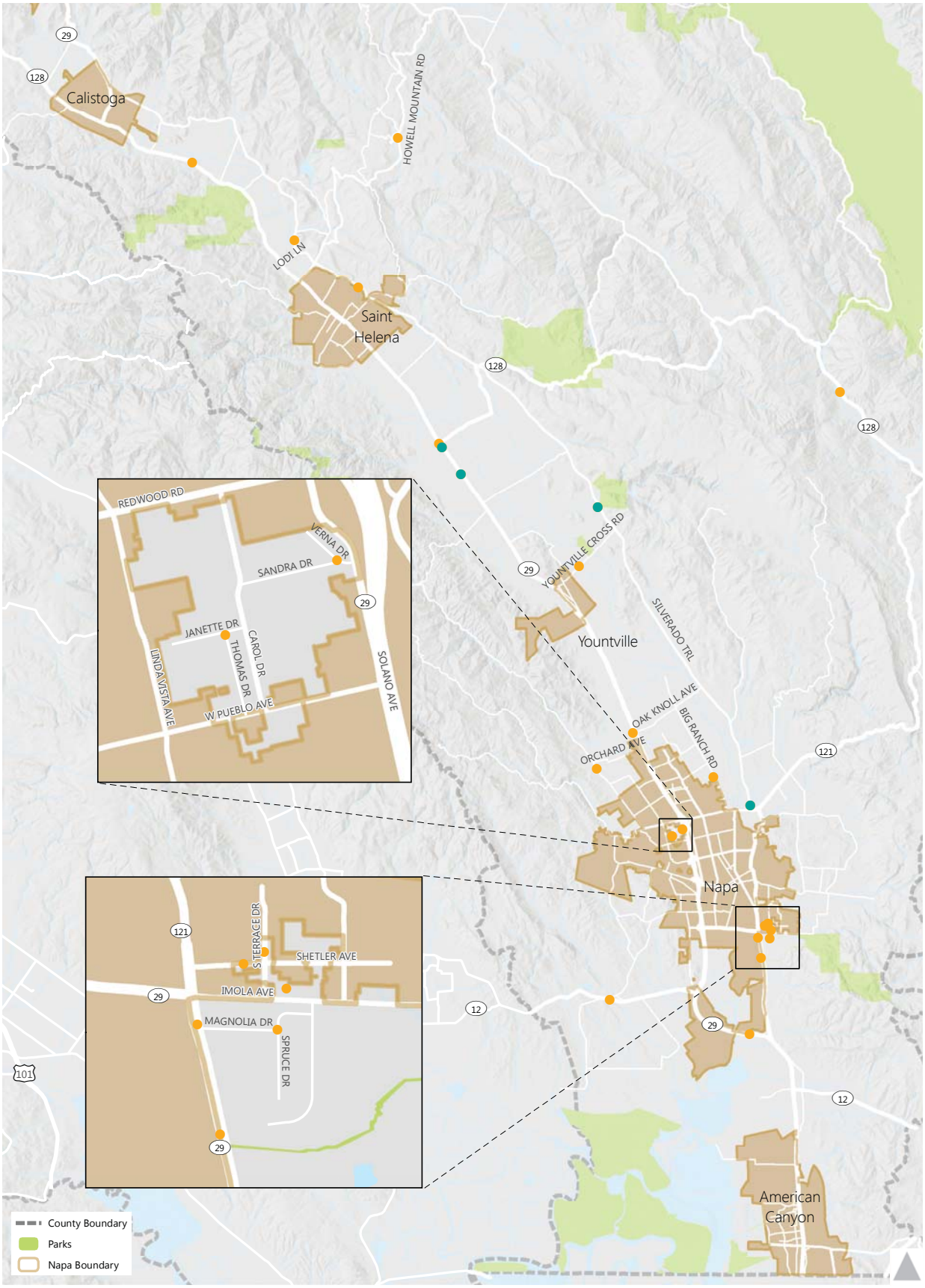
Perhaps one of the more telling sources of information in the SWITRS data is the Pedestrian Action variable, which describes what the pedestrian was doing immediately before the collision occurred. According to the pedestrian actions presented in **Table UNC-3**, pedestrian safety issues surrounding collisions are typically focused around walking on the road or shoulder in the Unincorporated County.

TABLE UNC-3: UNINCORPORATED COUNTY COLLISION SUMMARY PEDESTRIAN ACTIONS (2003-2012)

Pedestrian Action	Number of Collisions		
	Injury	Fatality	Total[1]
Walking In Road, Including Shoulder	15	4	19
Crossing Not in Crosswalk	6	1	7
Crossing in Crosswalk at Intersection	3	0	3

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

Source: SWITRS



Pedestrian-Involved Collisions 2003-2012
Unincorporated County

- Fatal Collision
- Injury Collision

Pedestrian Collision Fatalities

Density	Intersection	Total Collisions
●	Silverado Trail and Trancas St.	1
●	Silverado Trail and Yountville Cross Rd.	1
●	Route 29 and Bella Oaks Ln.	1
●	Route 29 and Niebaum Ln.	1

Exhibit UNC-4
Pedestrian-Involved Collisions
2003 - 2012 Unincorporated Napa County

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 UNC-4**. Connectivity and safety were the key themes across the countywide comments.

TABLE UNC-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 “other” in the unincorporated county 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.

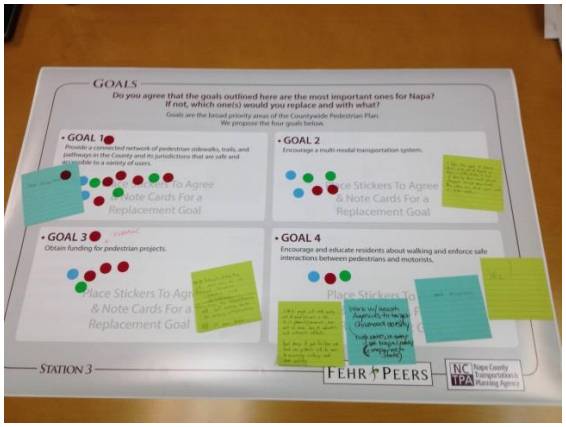
Public workshops were held throughout the County in Winter 2015: in Napa on January 22 at NVTA; in Yountville on January 27; in St. Helena on January 28; and in American Canyon on February 4. Due to recent public workshops held in Calistoga through development of their Active Transportation Plan in 2014, 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**

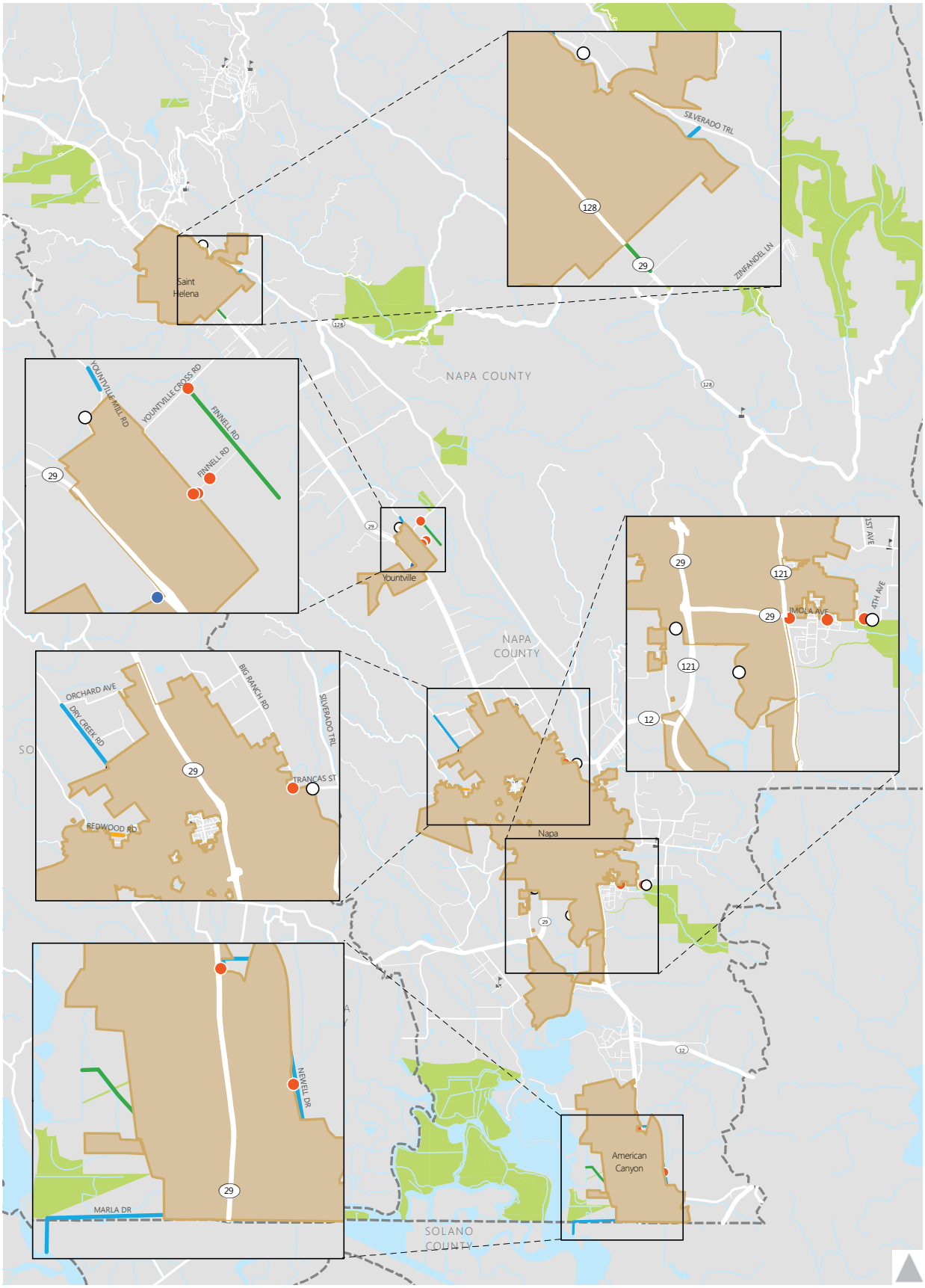
  At Station One, participants voted on a list of common barriers to walking to indicate which were most relevant to the walking environment in their jurisdiction and countywide. Participants also wrote comments on large-scale aerial maps placed on tables or on the floor to highlight existing barriers to pedestrian travel and locations where improvements were needed. Comments for unincorporated areas near jurisdictions in the county were received at all four workshops. 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 areas of reported pedestrian needs and inform the location of focus areas. The results of this mapping exercise included just fewer than 20 comments in the unincorporated county, shown in *Exhibit UNC-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 UNC-4. Many of these miscellaneous comments were received on the border of St. Helena, Yountville, and Napa and included suggestions for bike lanes, documentation of truck turning issues, and desired connections to Skyline Park near the City of Napa. All 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.
- **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.



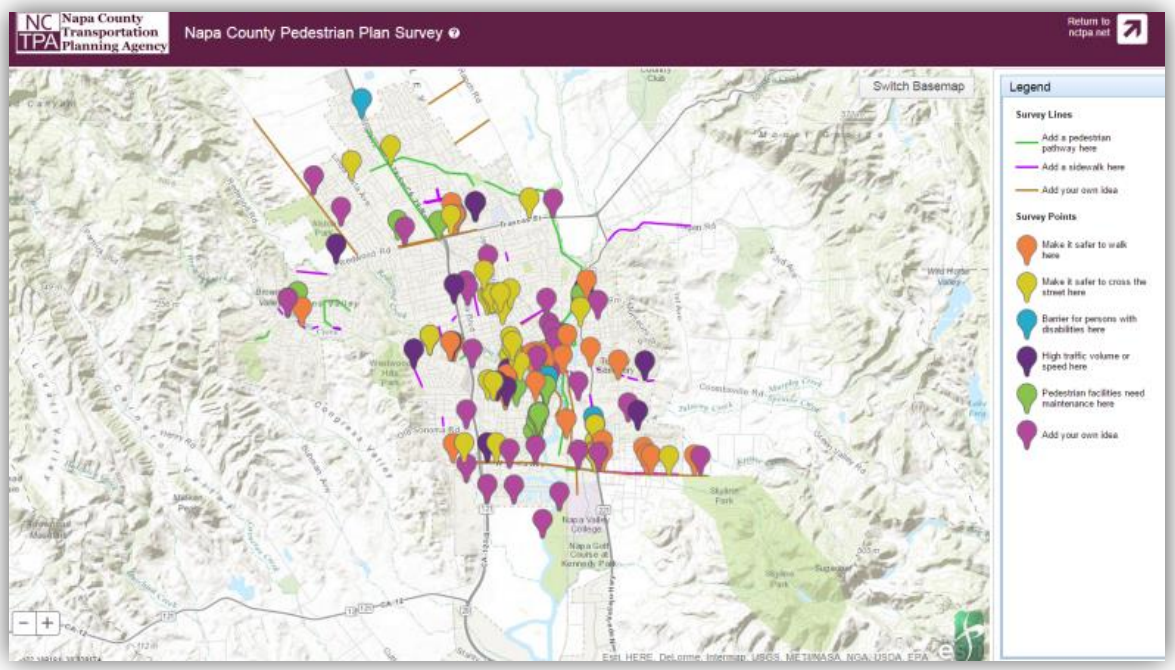
Safety
Maintenance
ADA
Other
Add a Pedstrian pathway
Add a Sidewalk Here
Other

Exhibit UNC-5
Workshop Comments
Unincorporated Napa County

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.

Unincorporated County-Specific Focus Groups

At the outset of the plan development process, meetings were held with key staff from the Unincorporated County to initiate the planning process on December 9, 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 UNC-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 County staff and included identifying appropriate criteria for pedestrian improvements that fit within the rural context of unincorporated roadways, including factors that may reduce the necessity for pedestrian facilities due to lack of pedestrian generators or limiting terrain and topography. County staff also expressed interest in focusing on schools, bus stops, and ADA access improvements. These goals are incorporated into key programmatic and policy recommendations in this plan.

Additional focus group meetings were held for the Unincorporated County walking audit (conducted in Angwin) on May 26, 2015, and to review the list of suggested pedestrian projects on August 20, 2015.

Potential Barriers

As shown in **Table UNC-4**, connectivity and safety are two of the top pedestrian issues identified from the public. To geographically visualize the safety concerns in the Unincorporated County, a heat map was created, as shown in Exhibit UNC-6. This map shows the density of safety-related public comments received during the outreach process as well as unincorporated pedestrian-involved collisions, and is intended to represent potential barriers to walking. By including safety-related public comments, this map displays locations that may be under-represented in the collision data due to a high level of collision under-reporting with SWITRS data[8] or fewer people walking as a result of these perceived issues, thus providing a more comprehensive look at potential safety issues. This map may help supplement collision data to identify locations where near misses and other safety-related (but non-reported) issues may be present.

[8] 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

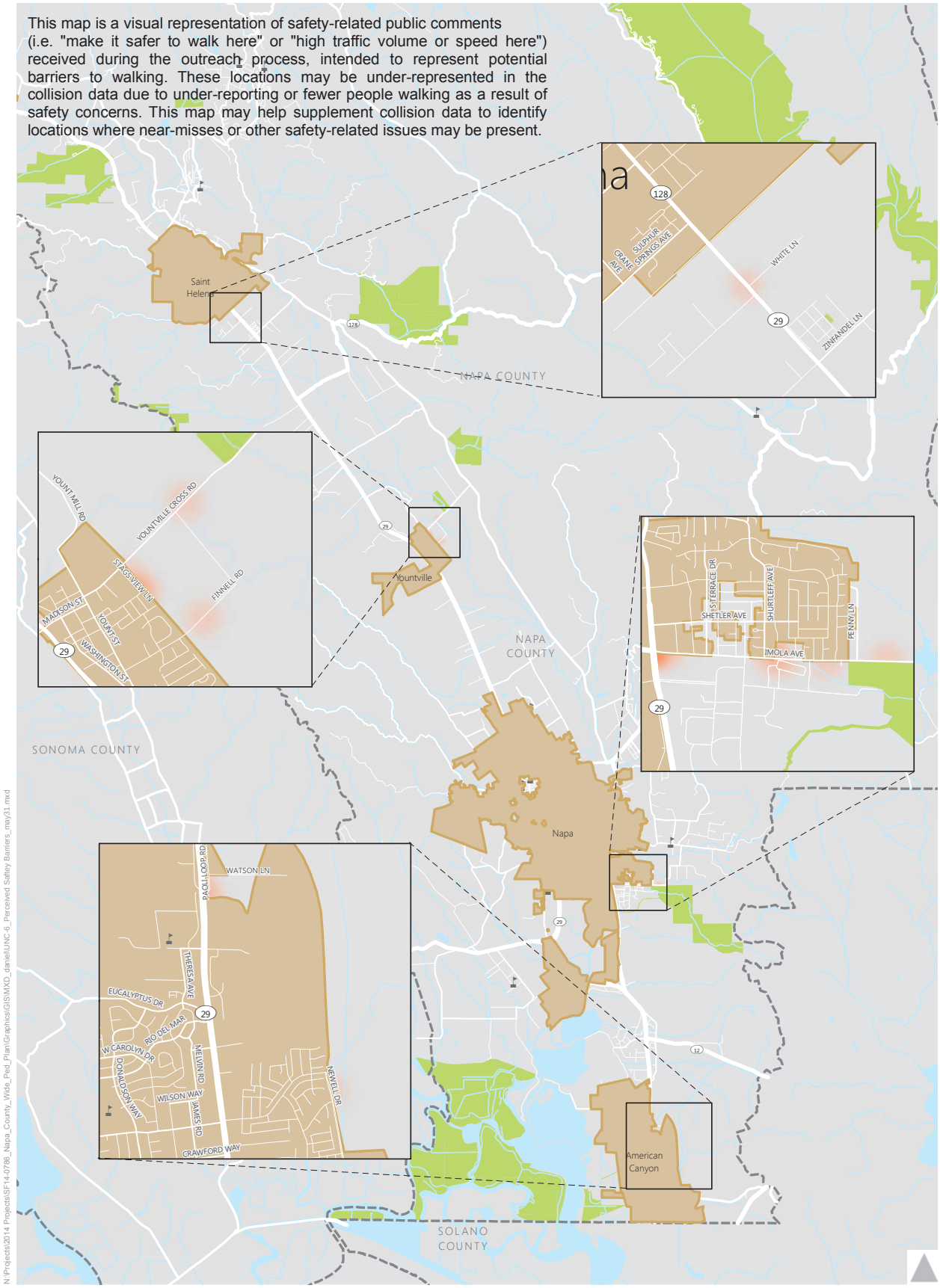


Exhibit UNC-6
Perceived Barriers: As Visualized by Safety-Related Public Comments
Unincorporated Napa County

Opportunity Areas

In the Unincorporated County, pedestrian activity is focused around village centers, trail systems, schools and transit stops. The terrain and topography present challenges for pedestrians, and walking is infrequent in more remote areas of the County; therefore, staff is focused on safety and ADA access near incorporated jurisdictions or other pockets of development. The County has recognized this plan as a key opportunity to identify unincorporated areas that have the greatest need for enhanced pedestrian safety and access. This plan directly addresses this goal by developing a list of proposed pedestrian facilities within key focus areas of the County. 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 Unincorporated County. 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 the Unincorporated County, 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 UNC-7*.

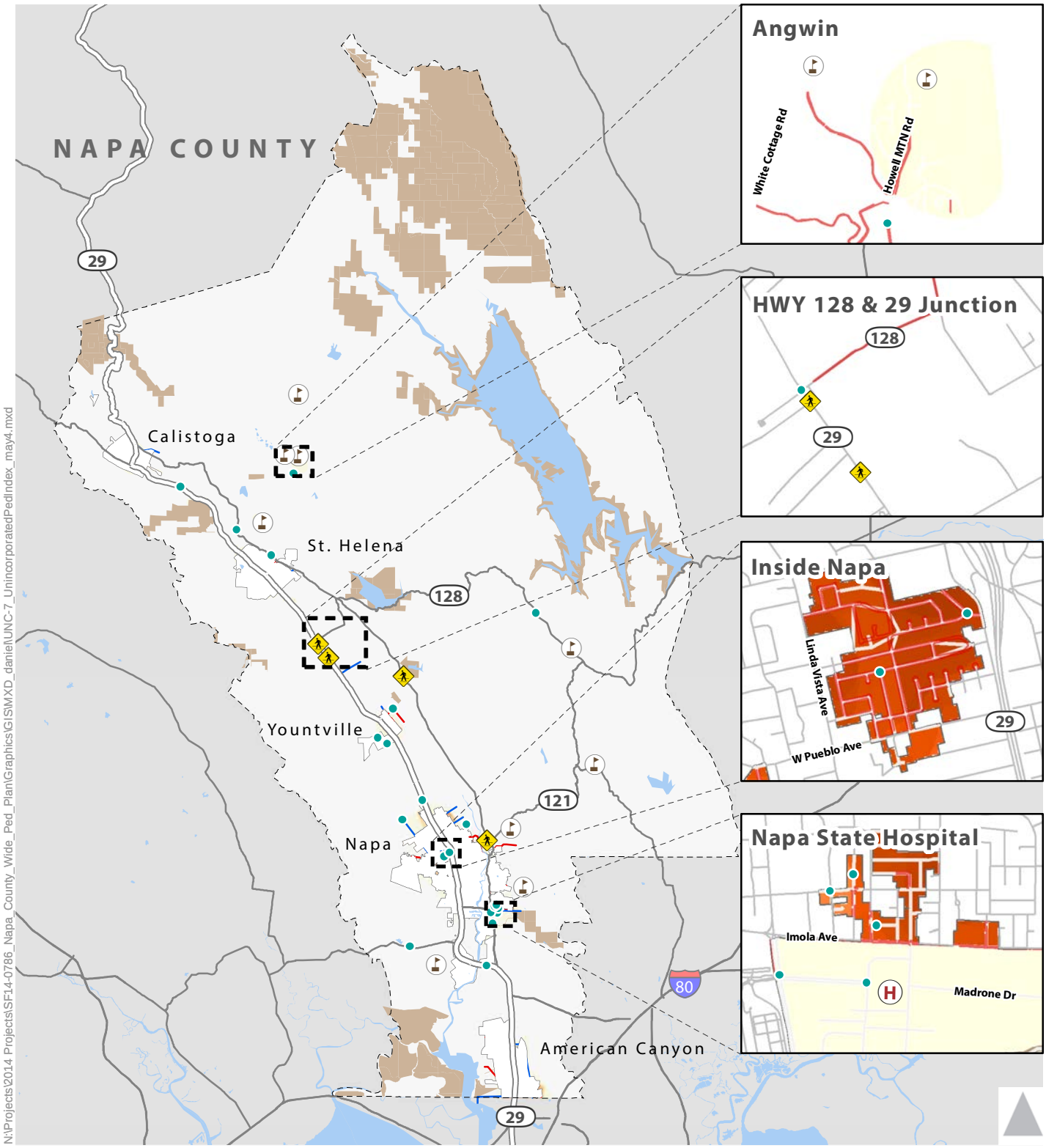
As illustrated on *Exhibit UNC-7*, Ped INDEX focus locations include the community of Angwin, unincorporated pockets near and within the City of Napa, and the community of Rutherford. After reviewing the locations of comments received during public outreach and the alignment with focus locations on the Ped INDEX maps, three potential walking audits were recommended to County staff:

- **Yountville Loop**: Yountville Cross Road from town to Finnell Road; Finnell Road from Yountville Cross Road to town boundary (1.1 miles)
  This walking audit could discuss options for traffic calming along Finell Road and Yountville Cross Road as they enter the Town of Yountville. One pedestrian collision was reported on unincorporated Yountville Cross Road in the last ten years, and several comments from the town and the public highlighted the need for traffic calming and pedestrian infrastructure along Yountville Cross Road and Finnell Road.

- **Unincorporated Neighborhood Pocket of Napa:** Candidate roadways include portions of Carol Drive, Kathleen Drive, and Janette Drive with soft shoulders in lieu of sidewalks, especially to serve Pueblo Vista Elementary School. These areas offer prototypical sites for countywide extrapolation. (1 mile)
- **Angwin Community:** Howell Mountain Road from Cold Springs Road to Clark Way; White Cottage Road from Toyon Street to Howell Mountain Elementary School, north driveway (1 mile)
  County staff expressed interest in studying this area due to the presence of two schools in combination with residential development, and the area includes Pacific Union College and Howell Mountain Elementary School.

After discussions with County staff regarding candidate locations, the third walking audit in the Angwin Community was chosen for study during walking audits, for a total of approximately one mile:

- White Cottage Road from College Avenue to Howell Mountain Elementary School
- Howell Mountain Road from Clark Way to Cold Springs Road



Demand:

Pedestrian Index Score

High — Low

Deficiencies:

Pedestrian Collisions (Injuries)

1

Pedestrian Fatality

Missing Sidewalks

Legend:

School

Parks

Exhibit UNC-7

Unincorporated Area - Pedestrian Index Demand & Deficiencies

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 to observe field conditions and brainstorm potential ideas for improvement with the following stakeholders:

- Rick Marshall, Public Works
- Kaycee Wanlass, Napa County Office of Education
- Sean Westenrider, Pacific Union College
- Cheryl Lynn de Werff, Howell Mountain School
- Harold Mills, Pacific Union College
- Lisa Bissell Paulson, Pacific Union College

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 UNC-9*. Descriptions of each project and additional program and policy recommendations are included below under *Priority Projects.*

Exhibit UNC-8

Angwin - Project Locations

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. Using consistent prioritization criteria countywide, this plan includes a tiered list of projects for the unincorporated county reflecting:

- 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 UNC-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 UNC-C.** A summary of the improvements is shown in **Table UNC-5**.

Funded or Constructed Projects

The County recently completed a pedestrian improvement project in 2015 to address traffic calming near Howell Mountain School. This included installing advance warning school zone signs and pavement markings prior to the school where a curve in the roadway presents visibility challenges for motorists. This recently completed project was assigned to “Tier Zero” in **Table UNC-5** and was not evaluated for prioritization.

TABLE UNC-5: UNINCORPORATED COUNTY PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
ON-GOING SYSTEM MAINTENANCE				
Sidewalk Gap Closure and Maintenance (No. 23 2015 CTP Program)	Countywide	Sidewalk maintenance, rehabilitation, and expansion	Sidewalks Maintenance	$$$
TIER ZERO (FUNDED OR RECENTLY CONSTRUCTED IMPROVEMENTS)				
T0-1 Howell Mountain Elementary School Advance Warning Signage	White Cottage Road north of Howell Mountain Elementary School	Advance warning signage and pavement markings	Traffic Calming	-
TIER ONE				
UNC-4 Advance Traffic Calming for Howell Mountain Elementary School	White Cottage Road north of Howell Mountain Elementary School	Speed feedback signs and rumble strips	Traffic calming	$5,700
UNC-9 Angwin Trail Improvements	Howell Mountain Road, College to Clark Way	Medium term: off-street path with trail crossing	Pathway Crossing treatments	$633,800
		Long term: Formalized hiking trail	Pathway	$82,500
UNC-10 Howell Mountain Road Traffic Calming	Howell Mountain Road, College to Clark Way	Lane width reduction and speed feedback signs	Traffic calming	$18,400
TIER TWO				
UNC-7 PUC Crossing Improvements	Howell Mountain Road at La Jota Drive	Crosswalk enhancements[1] and additional marked crosswalks	Crossing treatments ADA ramps	$952,800
	Howell Mountain Road at Angwin Avenue	Crosswalk enhancements[1] and additional marked crosswalks	Crossing treatments ADA ramps	

TABLE UNC-5: UNINCORPORATED COUNTY PEDESTRIAN IMPROVEMENTS				
Project ID	**Location**	**Description**	**Pedestrian Component**	**Estimated Cost**
	Howell Mountain Road at PUC Driveway	Crosswalk enhancements[1] and additional marked crosswalks	Crossing treatments ADA ramps	
	Howell Mountain Road at Brookside Drive	Crosswalk enhancements[1] and additional marked crosswalks	Crossing treatments ADA ramps	
	Howell Mountain Road at La Jota Drive	ADA access path[2]	ADA	$42,400
	Angwin Avenue, east of Howell Mountain Road	Relocated crosswalk and pathway[2]	Crossing treatments Site access	
UNC-1 College Ave Multi-Use Path	College Avenue, White Cottage Road to Fire Station	Off-street pathway	Pathway	$$
UNC-2 Pathway Treatments Access to School	White Cottage Road at College Avenue	Crosswalk enhancements[1]	Crossing treatments ADA ramps	$$$
	White Cottage Road, Howell Mountain Elementary School to College Avenue	Near term: Buffer along shoulder	Pathway	
		Long term: Pedestrian pathway		
	White Cottage Road at Toyon Street	Enhanced marked crosswalk[1]	Crossing treatments ADA ramps	
TIER THREE				
UNC-3 Howell Mountain School Improvements	White Cottage Road at Howell Elementary School	Marked crosswalk with sidewalk extension[3] and ADA path	ADA Crossing treatments Sidewalks	$$
		Marked crosswalk removals	Crossing treatments	

TABLE UNC-5: UNINCORPORATED COUNTY PEDESTRIAN IMPROVEMENTS

Project ID	Location	Description	Pedestrian Component	Estimated Cost
UNC-5 PUC South Gateway Treatments	Howell Mountain Road at Bishops Place	Speed feedback sign	Traffic calming	$$
	Howell Mountain Road at Cold Springs	Crosswalk enhancements[1]	Crossing treatments ADA ramps	
		Feasibility study for roundabout or Pedestrian Hybrid Beacon	Traffic calming Crossing treatments	
UNC-6 PUC Corridor Improvements	Howell Mountain Road, Cold Springs to Angwin Avenue	Pathway, lighting	Pathway	$$$
		Sidewalk	Sidewalks	
UNC-8 Howell Mountain Road	Howell Mountain Road at College	Near term: Enhanced marked crosswalks[1], driveway closure	Crossing treatments ADA ramps	$$
		Long term: Feasibility study for roundabout	Traffic calming	$

1. An enhanced crosswalk includes additional safety treatments such as high visibility striping, 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 location-based recommendations are included in Appendix UNC-C. For additional information on the application of these enhancements, refer to the Crosswalk Policy of this plan.
2. These improvements are outside of County right-of-way on PUC property.
3. These improvements are outside of County right-of-way on Howell Mountain Elementary School property.

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

Source: Fehr & Peers, 2015

Preserving the rural character is an important value to the unincorporated communities and a key consideration in the design of pedestrian infrastructure, especially when considering alternatives to sidewalk installation. Several roadways in the unincorporated areas may be potential candidates for in-street walkways where sidewalks may be infeasible due to engineering constraints or community values. This low cost improvement could include a combination of striping, pavement markings, and signage to designate an existing shoulder or bike lane as a shared space for bicyclists and pedestrians. Additional design guidance is provided in the Design Guidelines (**Appendix UNC-F**) under *Enhanced Walkways*. Variations of this treatment could be used as an interim or near term improvement while funding is secured for longer term improvements, such as sidewalks. Specific locations where this treatment could apply are College Avenue and White Cottage Road, as shown in Improvement UNC-1 and UNC-2. For these locations, raised buffers could be included to increase separation from vehicles and improve pedestrian comfort.

Including landscaping can improve the beauty of the pedestrian environment, improve management of storm water, and can help to blend physical improvements into the natural landscape, especially in a more rural setting. This could include landscape strips and trees along sidewalks, bioswales at curb extensions, or native plants along a pathway. Specific locations where this may be appropriate are intersections along Howell Mountain Road, where curb extensions are recommended adjacent to Pacific Union College between La Jota Drive and Brookside Drive, described in Improvement UNC-7. Landscape strips and non-invasive trees could also be considered if right-of-way is available for the recommended sidewalk on Howell Mountain Road, Improvement UNC-6.

Supporting Programs and Policies

Key program and policy recommendations that complement the engineering-related projects are shown below in **Table UNC-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 UNC-6: UNINCORPORATED COUNTY PROGRAM AND POLICY RECOMMENDATIONS

Program or Policy	Recommendations
Education and Encouragement	
Safe Routes to School (SRTS) Coordination	Coordinate with the Napa County Office of Education to continue SRTS programs in the County, and determine feasibility of implementing recommendations under the Safe Routes to School Support Program in the *Countywide Implementation* chapter of the countywide plan.
Safety and Enforcement	
Law Enforcement for Pedestrian Safety	Seek opportunities for increased enforcement of speeding on roadways near incorporated areas and potential pedestrian nodes to align with countywide collision reduction goals. Invite officers to ATAC meetings on a quarterly basis and consider working with neighboring incorporated police departments to designate 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 *Countywide Implementation* 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.

TABLE UNC-6: UNINCORPORATED COUNTY PROGRAM AND POLICY RECOMMENDATIONS	
Program or Policy	**Recommendations**
Maintenance	
Repair of Sidewalks, Crosswalks, and Curb Ramps	• Continue to regularly improve and repair uneven sidewalk, broken asphalt in crosswalks, and install new curb ramps as part of the Countywide Sidewalk Maintenance Program in Table UNC-4 above. This could include consideration of implementing an ADA Transition Plan and/or a trip and fall monitoring program. • Determine feasibility of adding a page to the County'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 County's Capital Improvement Program (CIP). This could include the reporting of maintenance needs for pedestrian-related pavement markings and traffic control devices.
Overgrown Vegetation on Sidewalks and Planting Strips	• Countywide, ensure 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. Require adjacent property owners to maintain landscaped areas with live and healthy plant materials, replacing plant materials when necessary to maintain full function and aesthetics; to water, weed, prune, fertilize and keep sidewalks and planting strips litter free.
Engineering and Design Standards	
Pedestrian Design Guidelines	• Adopt pedestrian design guidelines in this plan, Appendix UNC-F, especially those with rural context including distinctions for rural remote roadways and those near pedestrian generators • Implement Crosswalk Guidelines, included in Appendix UNC-F of this plan, to enable the County 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.
Complete Streets	
Development Review Checklist	Create checklist for development review to ensure considerations for pedestrian access and safety, especially near bus stops, schools, and through 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: http://www.mtc.ca.gov/planning/bicyclespedestrians/Routine_Accommodation_checklist.pdf
Funding and Implementation	
Implementation Plan	Develop focus area list to identify projects beyond those recommended in this plan through use of PedINDEX map in this plan and public outreach to unincorporated communities. Prioritize ADA improvements and enhancements near schools and transit.

Next Steps

Funding Sources

The unincorporated County areas have very few pedestrian facilities and most were built by the developer of the fronting property, such as the Airport area and the Silverado residential community. Spending by County staff on maintaining existing pedestrian infrastructure is minimal and includes restriping existing crosswalks as needed.

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 December 2015. 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 the Unincorporated County through Caltrans, the Metropolitan Transportation Commission (MTC), and the Napa Valley Transportation Authority (NVTA).

Table UNC-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 C** 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 UNC-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 UNC-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 UNC-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 the top 4 priority projects determined in the previous section of this plan, while the remaining projects were assigned a ranking in Table UNC-5 to indicate an estimated range of cost level. Prepared cost estimates, included in **Appendix UNC-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 UNC-9** below.

TABLE UNC-9: PRIORITY PROJECT COSTS

Project	Total Cost[1]
UNC-4: Advance Traffic Calming for Howell Mountain Elementary School	$5,700
UNC-7: PUC Crossing Improvements	-
County Total	$952,800
PUC Total	$42,400
UNC-9: Angwin Trail Improvements	-
Medium Term	$633,800
Long Term	$716,300
UNC-10: Howell Mountain Road Traffic Calming	$18,400

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.

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.

Unincorporated County Appendix

UNC-A Benchmarking Table

UNC-B Existing Pedestrian Policies

UNC-C Detailed Project Lists and Prioritization

UNC-D Cost Estimates

UNC-E Plan Adoption Resolution

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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%[9]. 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:

[9] 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[10]. 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

[10] 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 NVTA 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**
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	Establish a construction pace of one pedestrian capital improvement project per year per jurisdiction Coordinate with NVTA to seek additional funding for infrastructure projects that support safe routes to school	• Continue to seek grant funding to implement the projects recommended in each jurisdiction plan • Coordinate with jurisdiction staff to inform schools and communities of relevant funding and grant opportunities • Reference the public involvement, analysis, and project evaluation efforts of this plan when applying for grants to fund projects
	Reduce annual pedestrian related collision rate by half by 2040	• Address collision locations identified in this plan by installing the projects identified and implementing the planned education and enforcement programs in Chapter 8. • Use 2015 as the baseline year for evaluation with progress evaluations at five-year intervals.
2. Encourage walking trips through enhancing key pedestrian connections to transit	Increase the number of walking trips to transit by 50% by 2040	• Work with NVTA and VINE to monitor the percentage of riders walking to transit • Prioritize and implement improvements near the VINE stations and high use stops in support of this goal
3. Take advantage of overlapping opportunities	Identify Complete Streets funding and project synergies with development and infrastructure projects	• 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 • Consider pedestrian facilities in all road resurfacing and intersection improvements
4. Encourage and educate residents about walking and enforce safe interactions between pedestrians and motorists	Administer SRTS programs to each interested school by the end of the grant cycle (2016) and secure grant to continue program Launch Safe Routes for Seniors and Safe Routes to Transit initiatives	• Implement the SRTS Program recommendations in this plan • Distribute pedestrian safety brochures to the public to promote walking to community events • 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 • Collaborate with senior centers and advocates to implement education, encouragement, and engineering projects to improve mobility for senior pedestrians • Collaborate with transit providers to prioritize and implement access improvements to transit stops

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; NVTA's 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 NVTA 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".

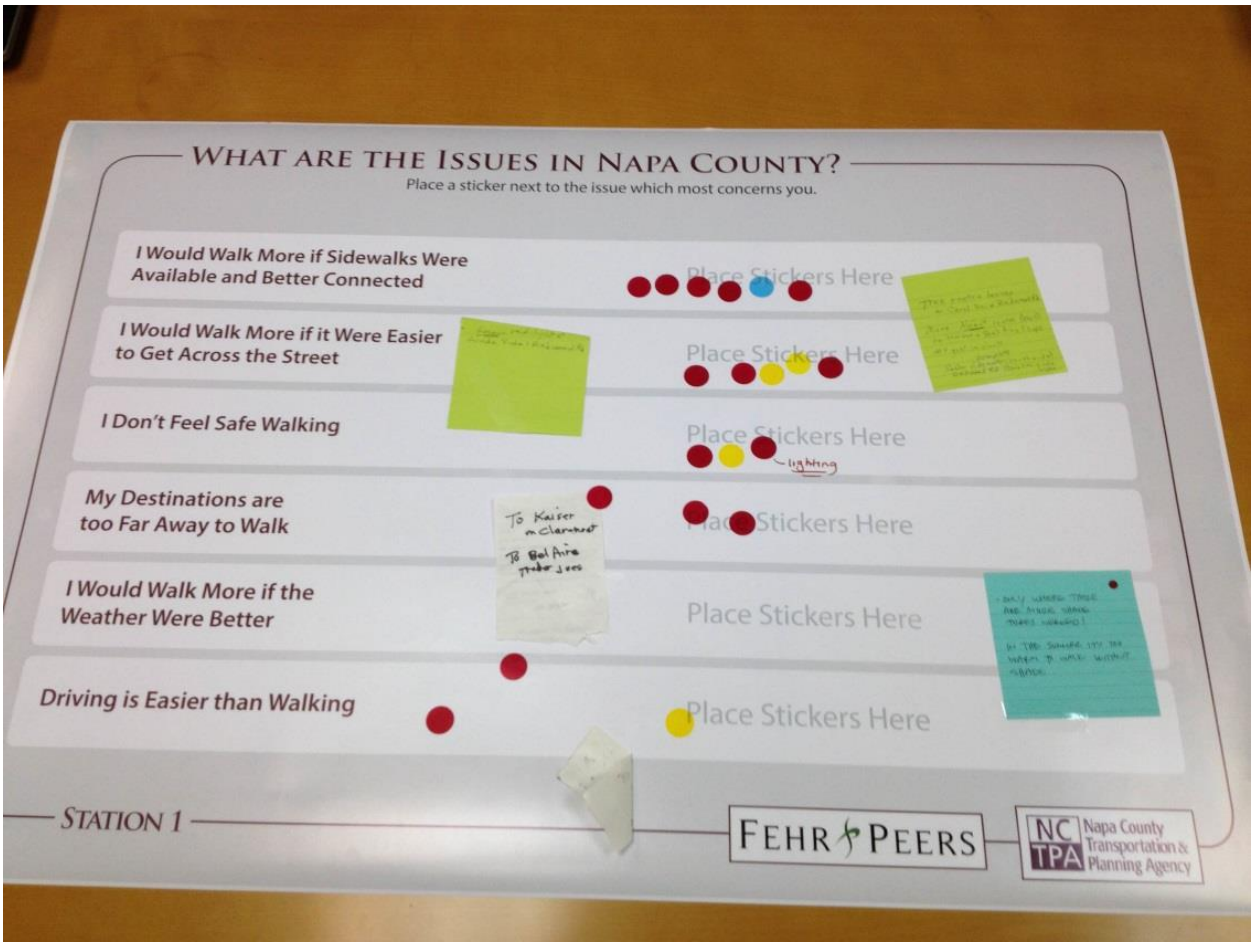
Local Plans

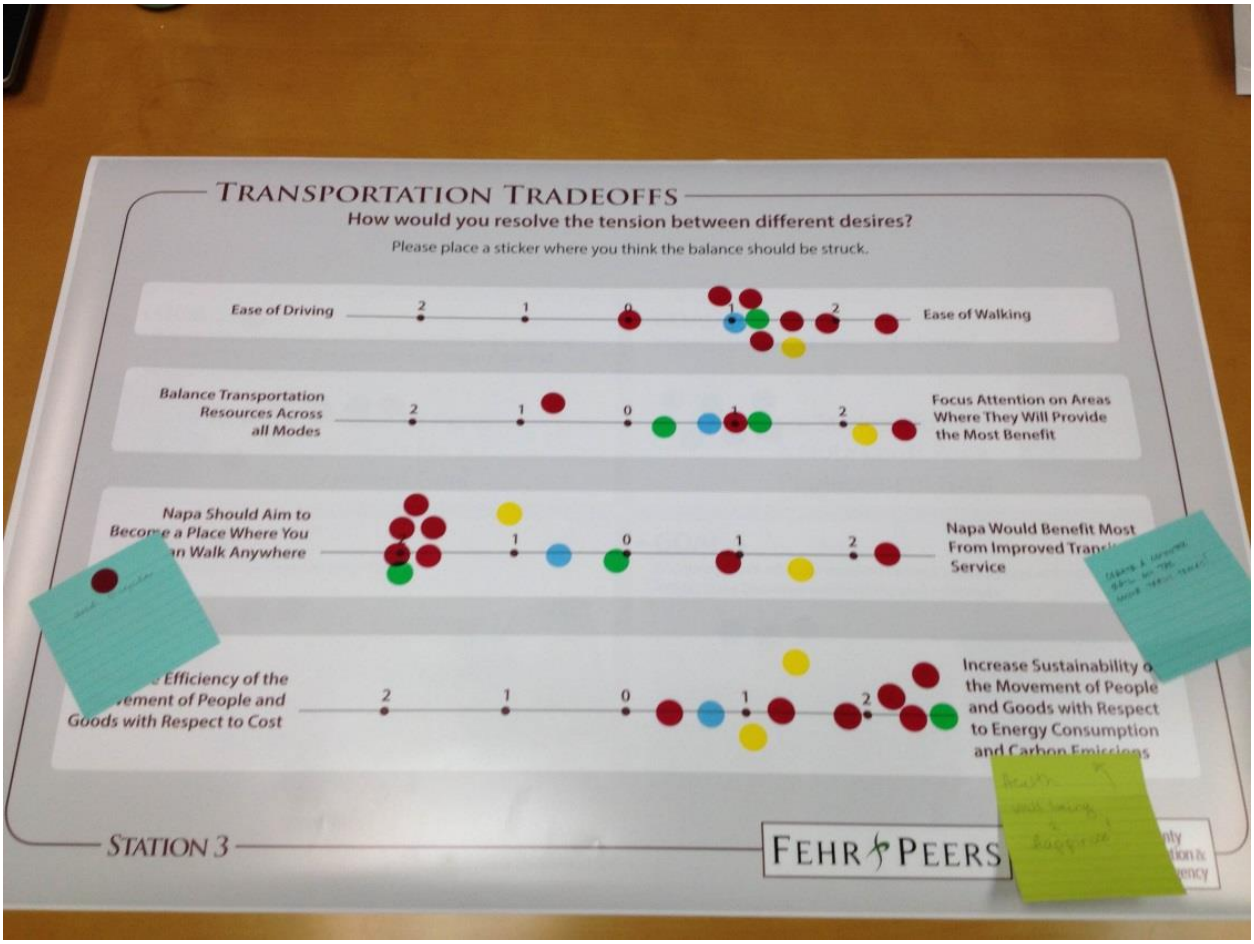
Evaluation and Next Steps

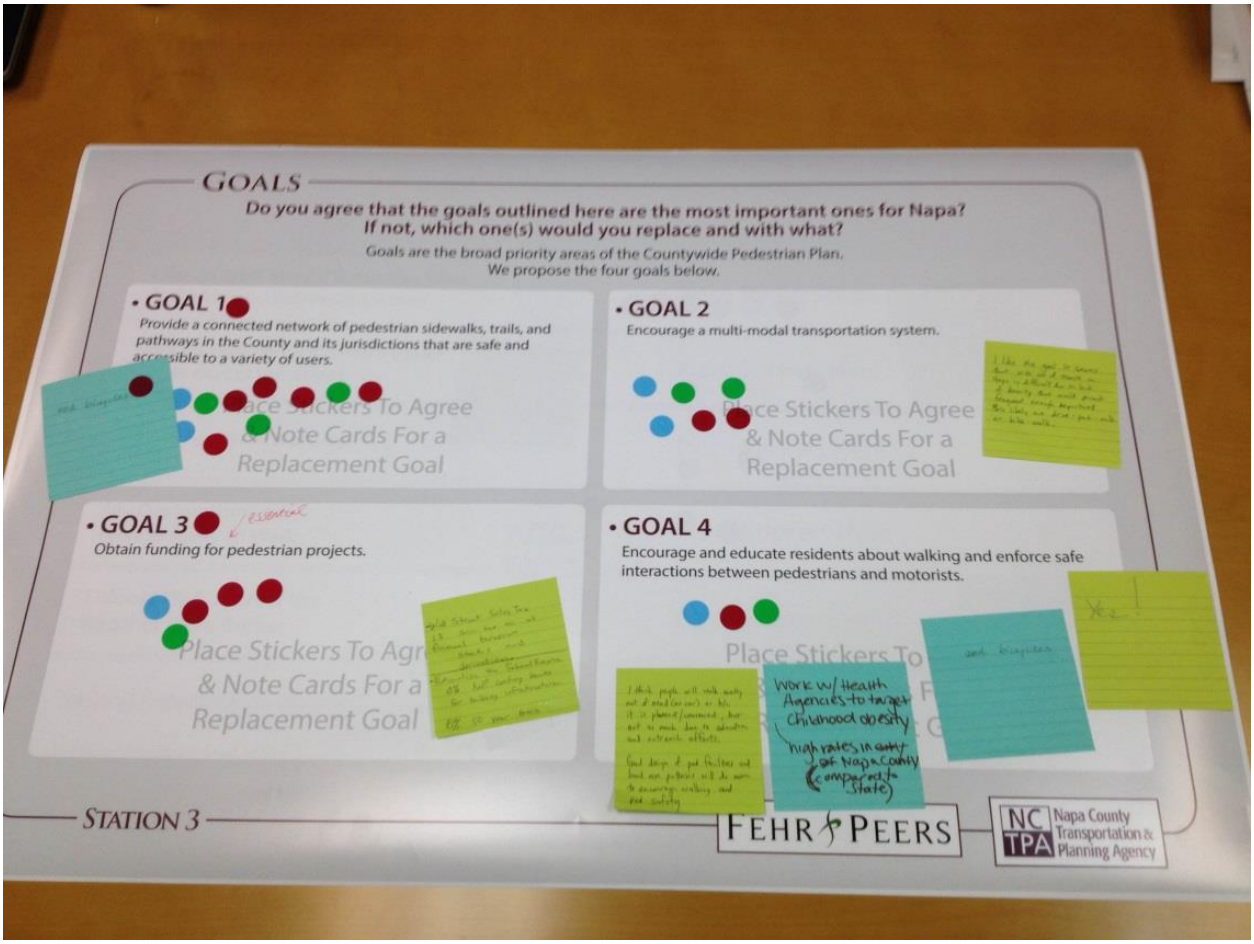
Napa County consists of six local jurisdictions: four cities, one town and the County government, which has responsibility for the unincorporated areas of the County. All six jurisdictions have adopted policies as part of their respective general plans in support of walking. A list of these policies can be found in Appendix B of each Jurisdiction Plan, *Existing Pedestrian Policies*.

Appendix A – Public Workshop Materials

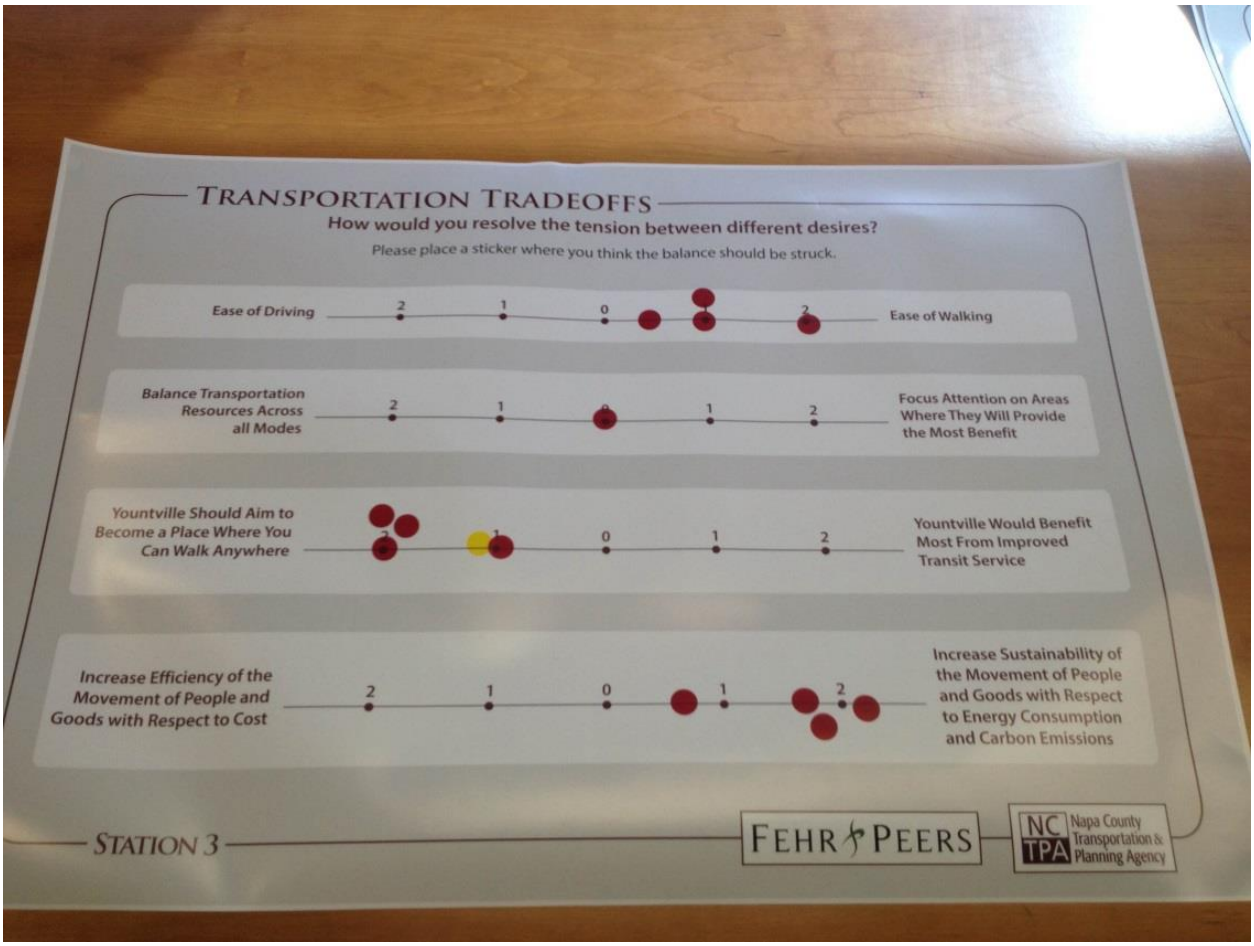
January 22, 2015 - NVTA

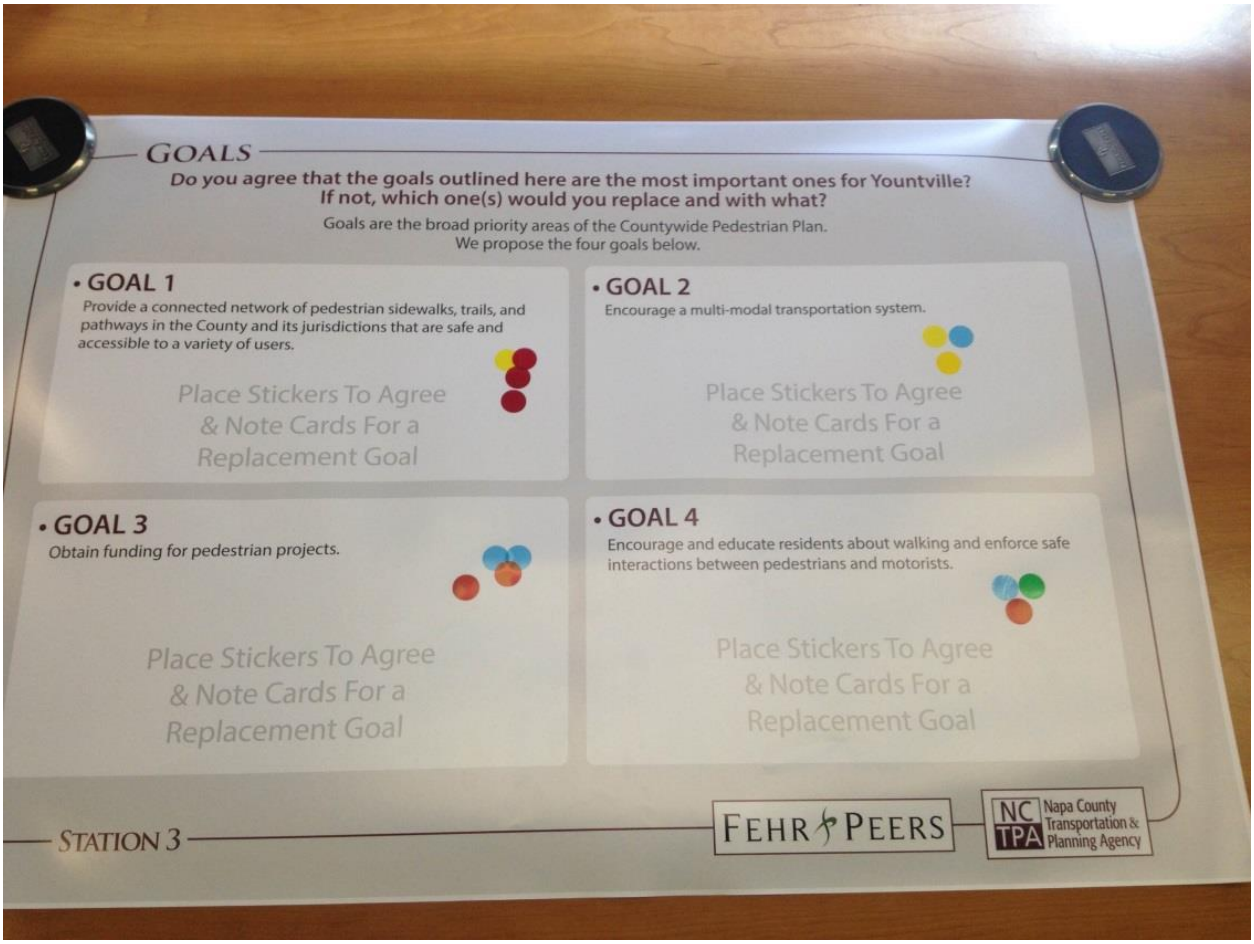



TRANSPORTATION TRADEOFFS
How would you resolve the tension between different desires?
Please place a sticker where you think the balance should be struck.
Ease of Driving
Ease of Walking
Balance Transportation Resources Across all Modes
Focus Attention on Areas Where They Will Provide the Most Benefit
Napa Should Aim to Become a Place Where You Can Walk Anywhere
Napa Would Benefit Most From Improved Transit Service
Efficiency of the Movement of People and Goods with Respect to Cost
Increase Sustainability of the Movement of People and Goods with Respect to Energy Consumption and Carbon Emissions
STATION 3
FEHR PEERS

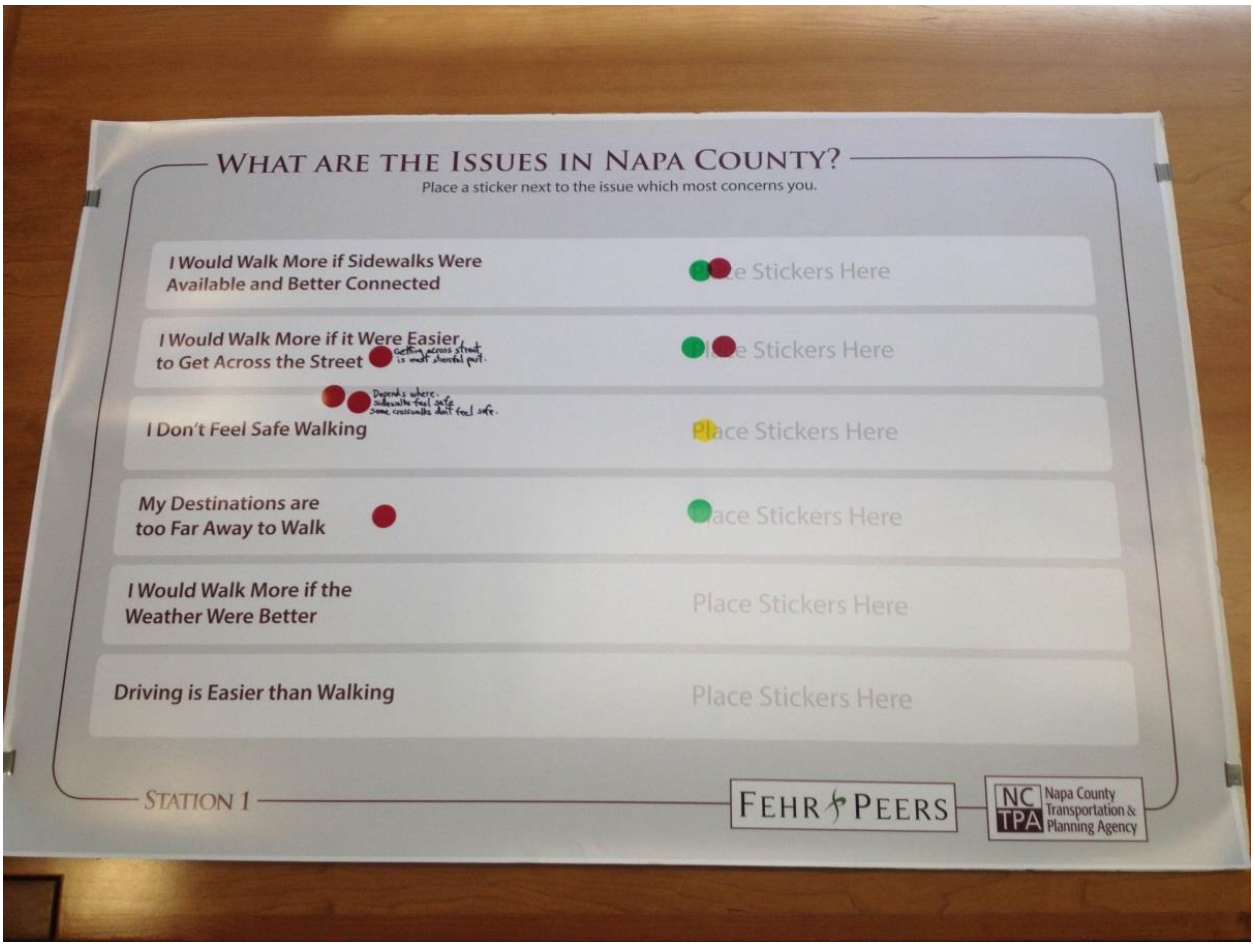

GOALS
Do you agree that the goals outlined here are the most important ones for Napa?
If not, which one(s) would you replace and with what?
Goals are the broad priority areas of the Countywide Pedestrian Plan.
We propose the four goals below.
• GOAL 1
Provide a connected network of pedestrian sidewalks, 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
Obtain funding for pedestrian projects.
Place Stickers To Agr & 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
Work w/ Health Agencies to target Childhood obesity
high rates in ~~county~~ of Napa County (compared to State)
STATION 3
FEHR PEERS
NC TPA Napa County Transportation & Planning Agency

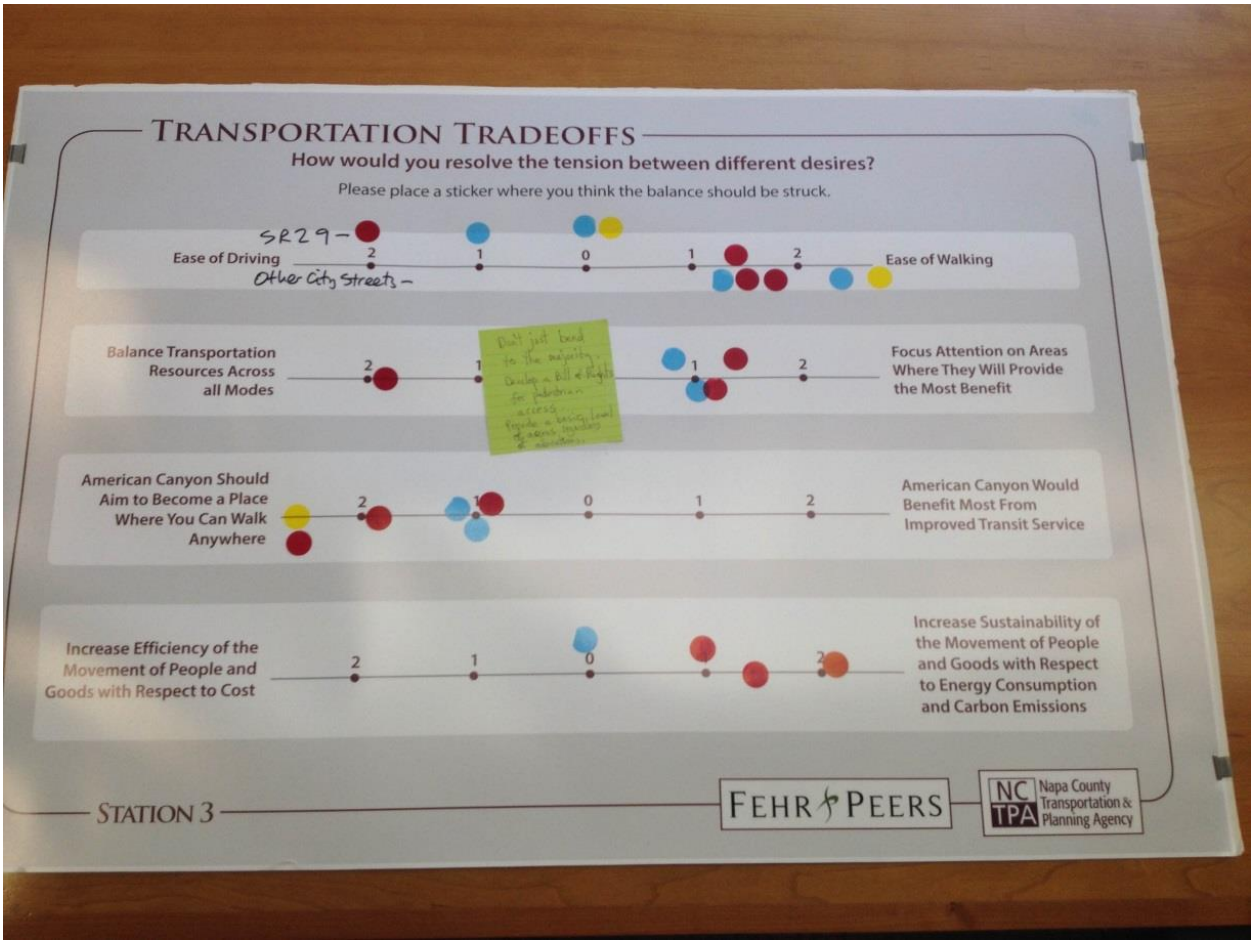
January 27, 2015 – Yountville Town Hall

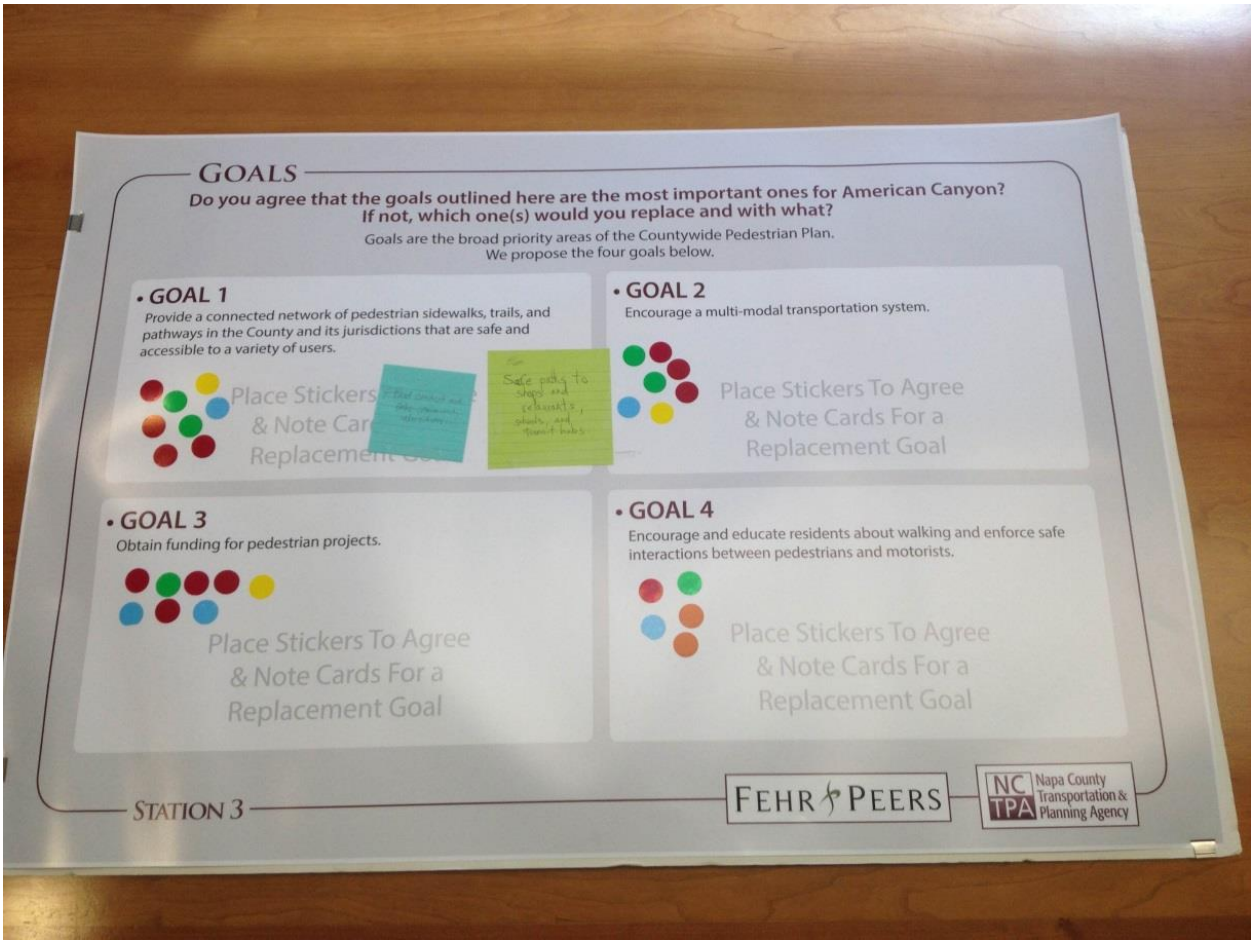



GOALS
Do you agree that the goals outlined here are the most important ones for Yountville?
If not, which one(s) would you replace and with what?
Goals are the broad priority areas of the Countywide Pedestrian Plan.
We propose the four goals below.
• GOAL 1
Provide a connected network of pedestrian sidewalks, 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
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

February 4, 2015 – American Canyon City Hall




TRANSPORTATION TRADEOFFS
How would you resolve the tension between different desires?
Please place a sticker where you think the balance should be struck.
SR29 –
Other City Streets –
Ease of Driving
2
1
0
1
2
Ease of Walking
Balance Transportation Resources Across all Modes
Focus Attention on Areas Where They Will Provide the Most Benefit
American Canyon Should Aim to Become a Place Where You Can Walk Anywhere
American Canyon Would Benefit Most From Improved Transit Service
Increase Efficiency of the Movement of People and Goods with Respect to Cost
Increase Sustainability of the Movement of People and Goods with Respect to Energy Consumption and Carbon Emissions
STATION 3
FEHR PEERS
NC TPA Napa County Transportation & Planning Agency


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.
Place Stickers
& Note Car
Replacement
Safe ped to shops and restaurants, schools, and transit hubs
• GOAL 2
Encourage a multi-modal transportation system.
Place Stickers To Agree
& Note Cards For a
Replacement Goal
• GOAL 3
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

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**
Built Environment (Density and Diversity of Land Uses)					
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 ***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*	Medium 10/100
		0.1-0.2	25		
		0.2-0.3	50		
		0.3-0.4	75		
		40+	100		
Proximity Factors (Destinations)					
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		
		5280+	0		
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		
Demographics					
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[11] 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

[11] 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

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

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 21st 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 (LWCP). 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

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[12], 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
Rural	
Roadways with < 400 ADT	Shoulders preferred, with minimum of 3 ft.

[12] 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

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.
Rural / Suburban	
Roadways with ADT > 2,000 and less than 1 dwelling unit (d.u.) / acre	Off-street facility preferred (sidewalks or side paths[1]). Minimum of 6-ft shoulders required. Paved shoulders are preferred to unpaved shoulders to provide an all-weather surface.
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.	
Roadways with 1 to 4 d.u. / acre	Sidewalks on both sides required unless side path provided.
Suburban / Urban Residential	
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.
Urban Commercial	
All Commercial Urban Streets	Sidewalks on both sides required.
Industrial	
All Streets in Industrial Areas	Sidewalks on both sides preferred. Minimum of 5-ft shoulders required.

[1] 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.

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

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/. 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%[1]
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*

Accessible Elements of a Curb Ramp

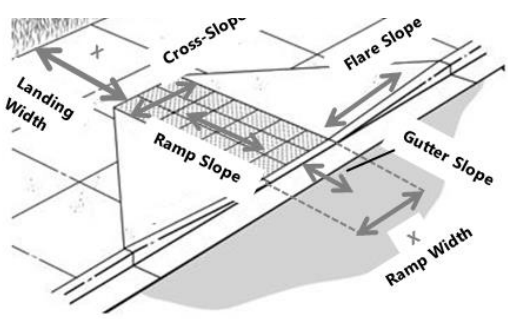


Image Source: https://www.ada.gov/pcatoolkit/app1curbramps.htm; Annotations: Fehr & Peers 2016

Accessible Elements of a Sidewalk

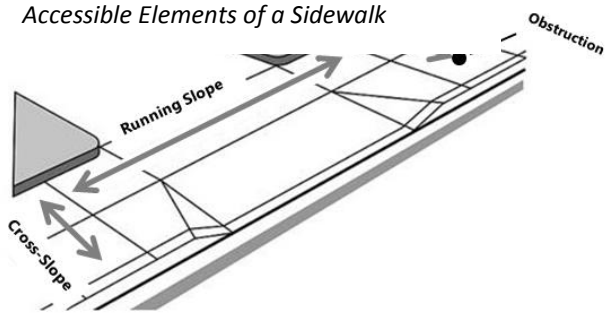
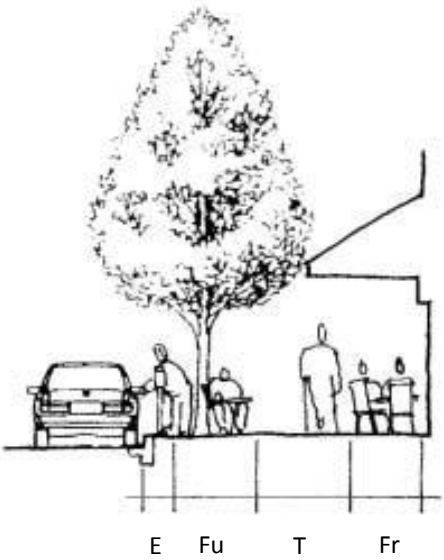


Image Source: http://www.ite.org/css/online/DWUT08.html; Annotations: Fehr & Peers 2016

Additional Treatment Guidelines

Table D-4: Sidewalk Zones and Corners

Description
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.
Design Example
 E = Edge Fu = Furnishings T = Throughway Fr = Frontage
Design Summary
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. 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.

- 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
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.
Design Example
Wayfinding (Napa and Yountville examples)
Design Summary
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.

Image Source: lajollalight.com (left); Fehr & Peers (right)

Table D-6: Pedestrian-Scale Lighting

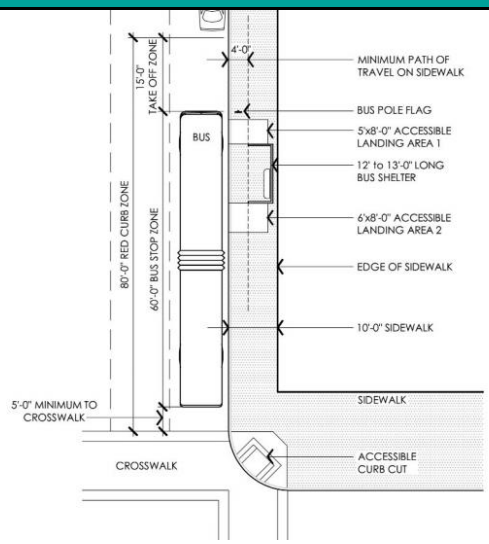
Description
Pedestrian-scale lighting improves pedestrian visibility and the perception of safety and comfort while walking. Well-lit pedestrian facilities are more inviting, and function well for pedestrians after sunset.
Design Example
Pedestrian-scale Lighting (South San Francisco and Calistoga)
Design Example
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.

Image Source: Fehr & Peers and Seattle.gov

Table D-7: High-Quality Street Furniture

Description
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.
Design Example
Design Summary
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.

Table D-8: Bus Stop Accessibility

Description
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.
Design Example
 *Bus shelter with bench at back of sidewalk, leaving adequate ADA compliant clearance at curb.* *Image Source: www.actransit.org, napavalleyregister.com*
Design Summary
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. 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. 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.

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
The Institute of Transportation Engineers (ITE) has drafted a new recommended practice: *Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges*. 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: • Provide pedestrian facilities to safely and efficiently accommodate pedestrians. • Design ramp geometries in ways that encourage slower vehicle speeds until past the pedestrian crosswalk (as illustrated in the design example below). • 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). • 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. • 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).

Design Example

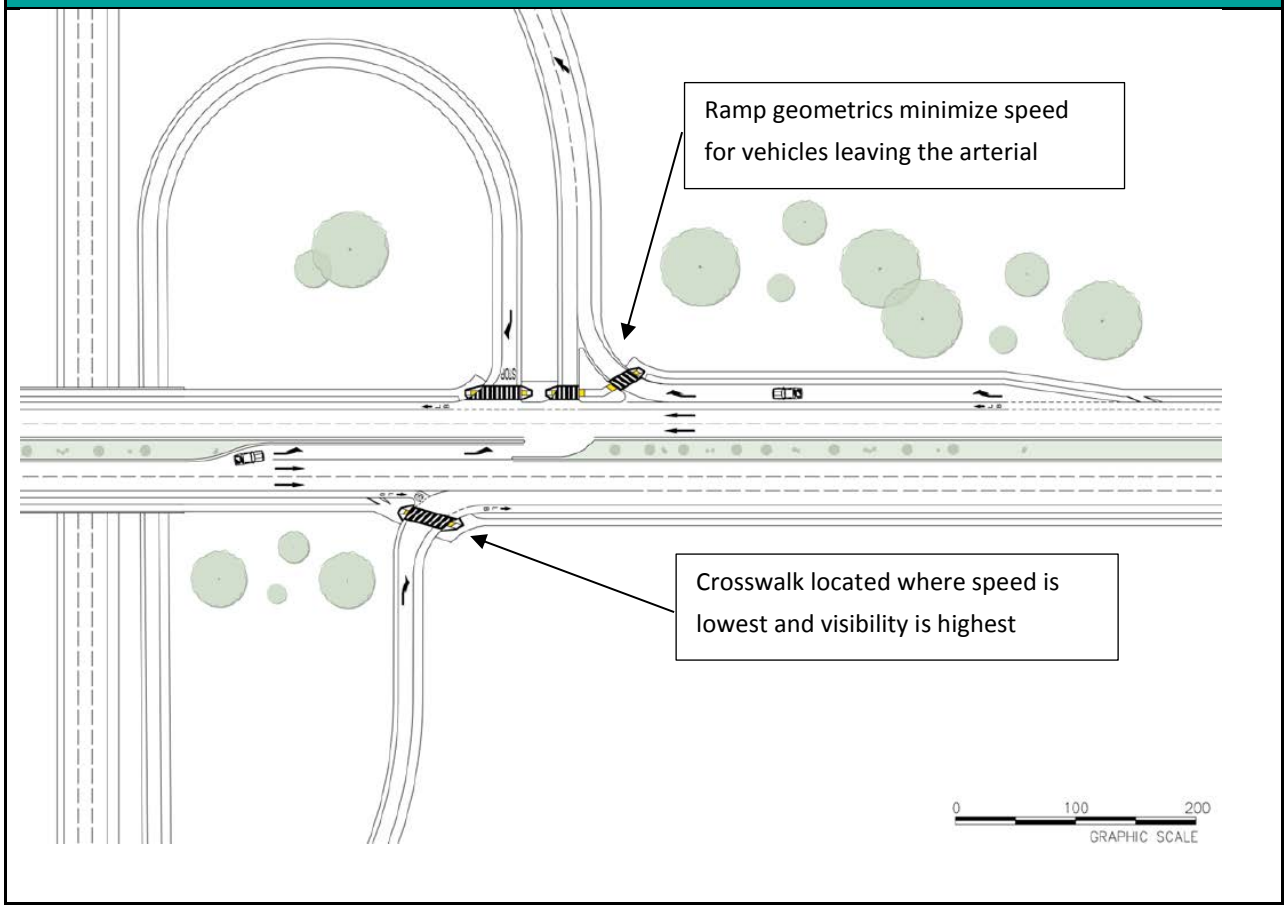
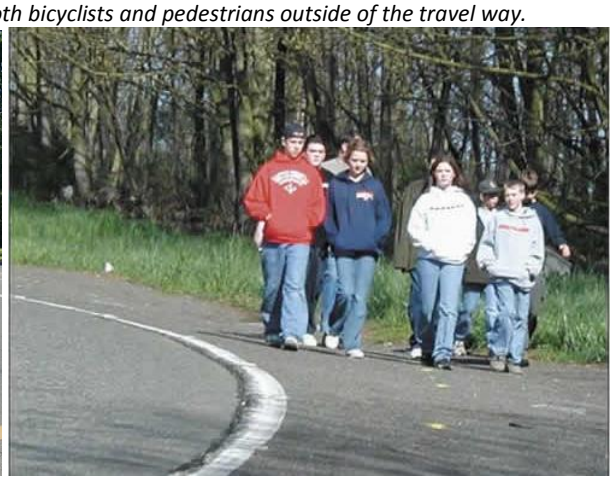


Image Source: ITE Recommended Practice: Design Guidelines to Accommodate Pedestrians and Bicyclists at Interchanges.

Table D-10: Multi-Use Shoulders (Paved or Unpaved)

Description
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.
Design Example
Wide shoulders *Eight to ten foot paved shoulders can provide space for both bicyclists and pedestrians outside of the travel way.* 

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

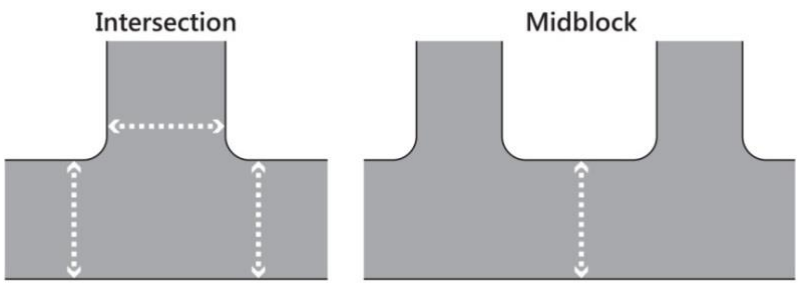
Crosswalks are primarily classified by three characteristics:

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 statues 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.

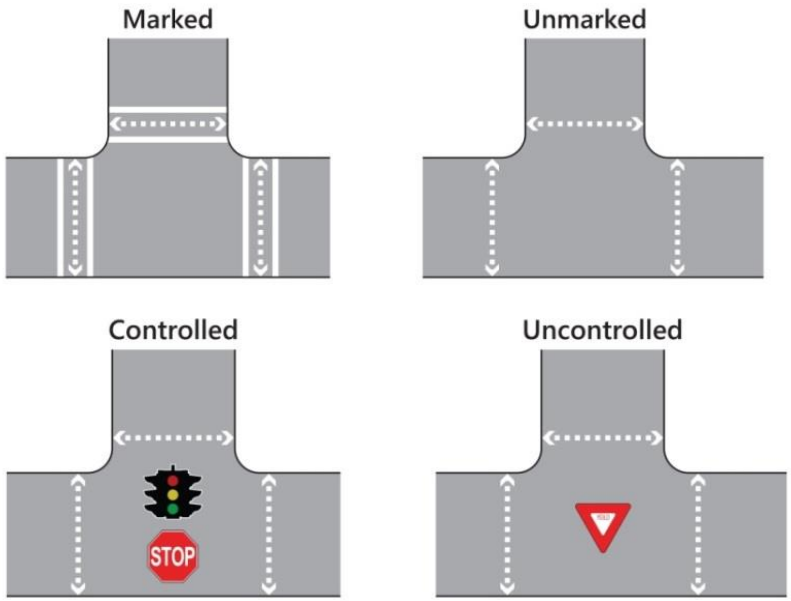
- Section 21950 describes right-of-way at a crosswalk:
  - The driver of a marked vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection.
- Section 21955 describes where pedestrians may *not* cross a street:
  - 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

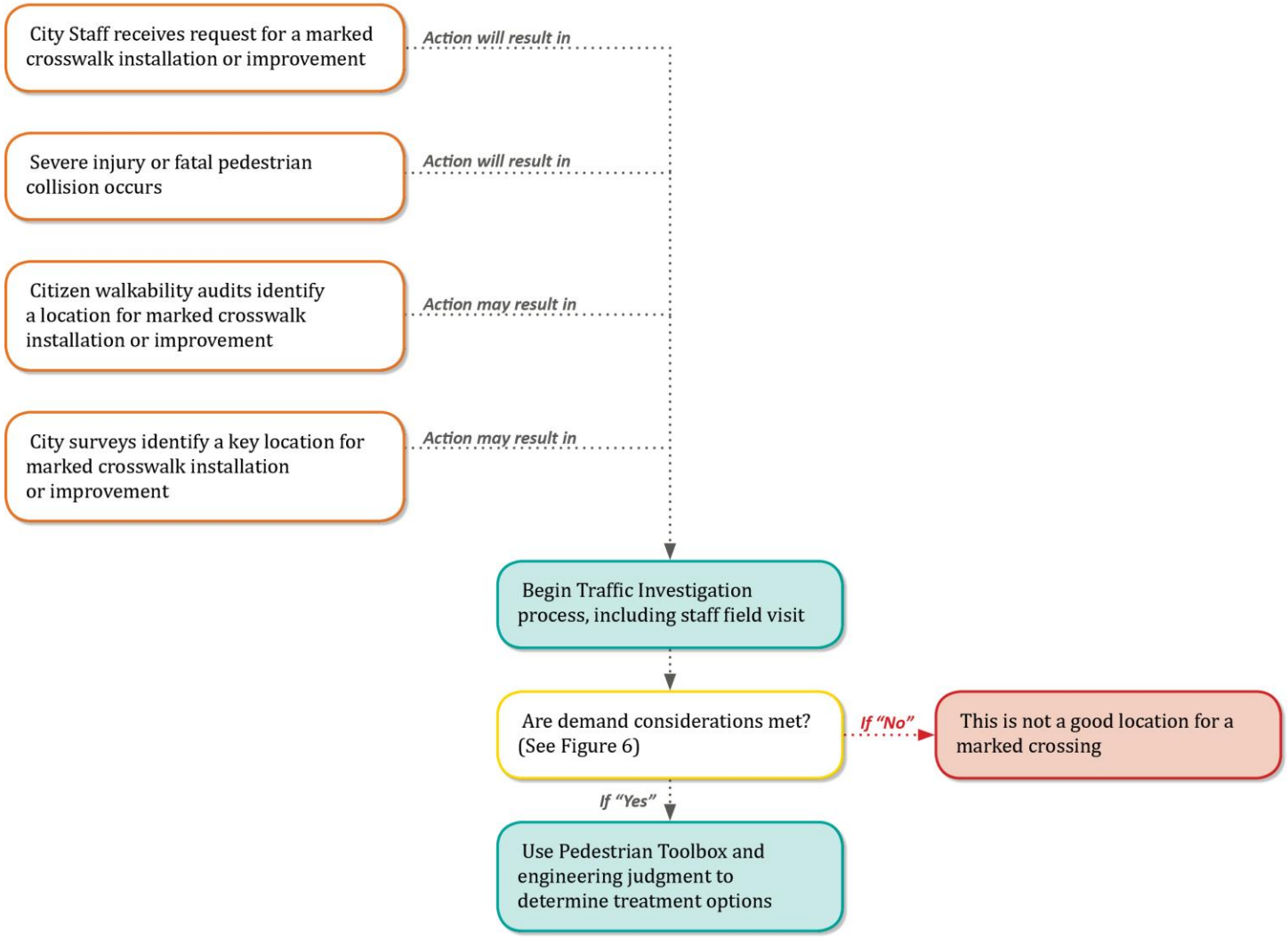
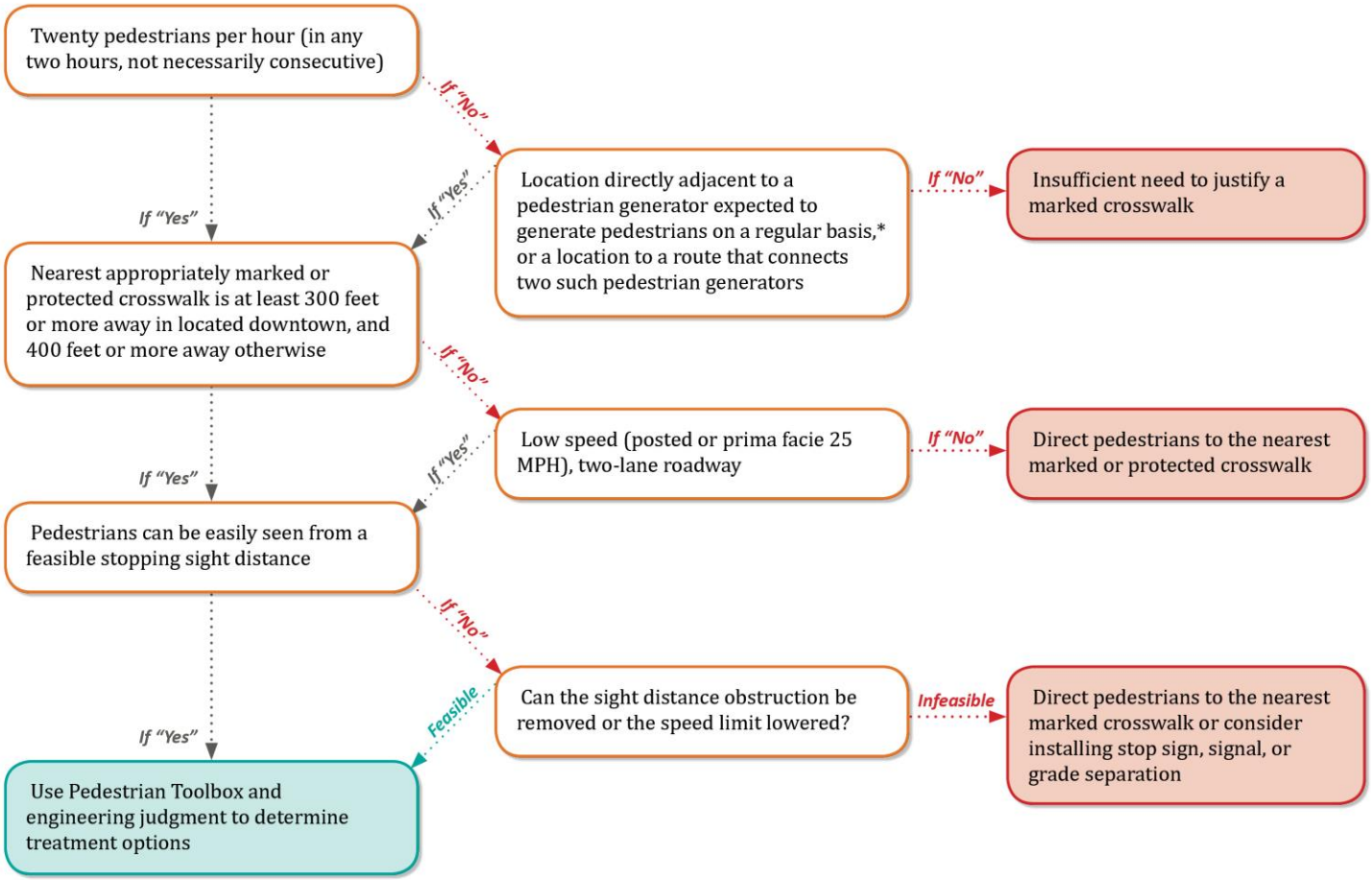


Figure A-2: Feasibility Analysis for Treatments at Uncontrolled Locations



* ***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[13] 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 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

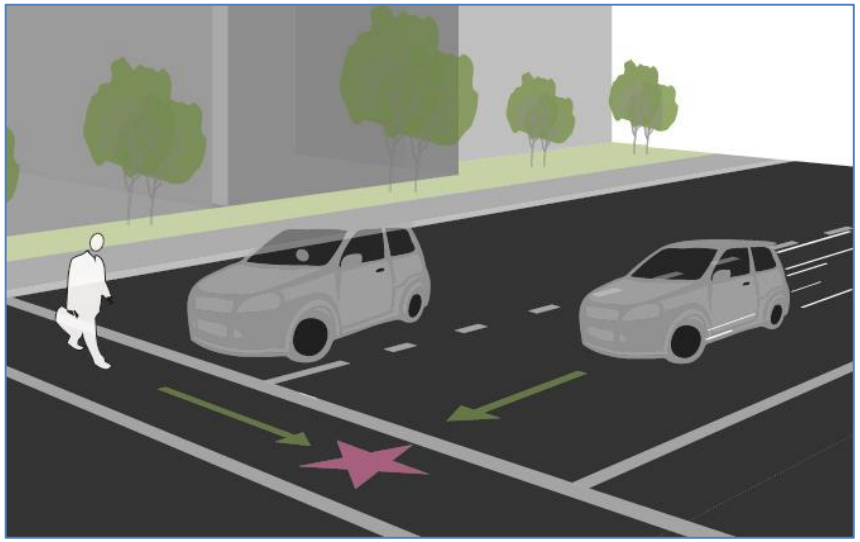
Mid-Block Crossings

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.

[13] 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.

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: 85th 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[14]:

- 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).

[14] 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)	***LEVEL 3*** 2 lane road: In-pavement flashers, overhead flashing beacons Multi-lane road: RRFB *Plus LEVELS 1 and 2*	***LEVEL 2*** Curb Extensions, Bus Bulb, Reduced Curb Radii, Staggered Pedestrian Refuge *Plus LEVEL 1*	***LEVEL 1*** High Visibility Crosswalk Markings, Advanced Yield Lines, Advance Signage
LOS E-F (average delay greater than 30 seconds)	***LEVEL 4*** Pedestrian Hybrid Beacon, RRFB, or Direct Pedestrians to Nearest Safe Crossing *Plus LEVELS 1 and 2*	***LEVEL 3*** 2 lane road: In-pavement flashers, overhead flashing beacons Multi-lane road: RRFB *Plus LEVELS 1 and 2*	***LEVEL 2*** Curb Extensions, Reduced Curb Radii, Staggered Pedestrian Refuge *Plus LEVEL 1*

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**
2-1. Fewer Travel Lanes ("Road Diet") *Image Source: Fehr & Peers*	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.	**Level 1**	$20/LF (Includes removal of existing pavement markings and repainting. Assumes existing curbs remain as is)

TABLE D-12: UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
2-2. Removal of Sight-Distance Obstructions *Image Source: Fehr & Peers*	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.	**Level 1**	$150/EA (Item removed is anticipated to be no larger than a sign and post)

TABLE D-12: UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
2-3. Pedestrian Refuge Island *Image Source: Fehr & Peers*	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.	**Level 1**	$130/LF (New curb and new concrete barrier. Assumes 6 foot median)

TABLE D-12: UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
2-4. Curb Extensions *Image Source: Fehr & Peers*	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. The 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.	**Level 1**	$140/LF (Curb, sidewalk, removal of existing curb, new bollards, does not include curb ramps)

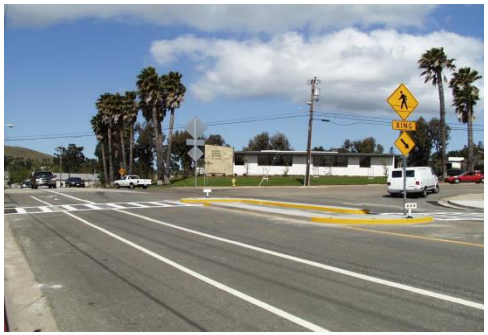
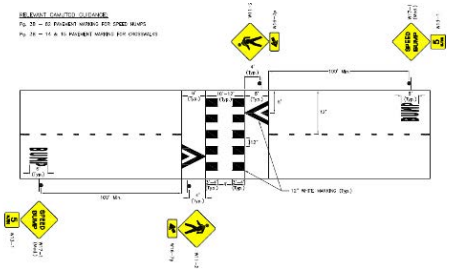
TABLE D-12: UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
2-5. Split Pedestrian Crossover (SPXO)  *Image Source: Fehr & Peers*	This measure is similar to traditional median refuge islands; the difference is that the crosswalks in the roadway are 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.	**Level 1** Note: see Table 11 for a Pedestrian Signal	$130/LF (Same materials as 6-3)
2-6. Raised Crosswalk  *Image Source: Fehr & Peers*	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.	**Level 2**	$18,000/EA

TABLE D-12: UNCONTROLLED CROSSINGS: GEOMETRIC TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
2-7. Pedestrian Overpass/Underpass *Image Source: Fehr & Peers*	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.	**Level 3**	$300/SF

Source: Fehr & Peers, 2014.

TABLE D-13: UNCONTROLLED CROSSINGS: STRIPING AND SIGNAGE			
Treatment	**Description**	**Level**	**Estimated Cost**
3-1. High Visibility Markings *Image Source: Fehr & Peers*	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 bicyclist s and pedestrians should be considered.	**Level 1**	$6/Foot

TABLE D-13: UNCONTROLLED CROSSINGS: STRIPING AND SIGNAGE			
Treatment	**Description**	**Level**	**Estimated Cost**
3-2. Advanced Yield Line *Image Source: Fehr & Peers*	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.	**Level 1**	$100/EA

TABLE D-13: UNCONTROLLED CROSSINGS: STRIPING AND SIGNAGE			
Treatment	**Description**	**Level**	**Estimated Cost**
3-3. Advanced Warning Signs *Image Source: Fehr & Peers*	High-visibility yellow or fluorescent-yellow-green (FYG) signs are posted at crossings to increase the visibility of a pedestrian crossing.	**Level 1**	$1,000/EA

TABLE D-13: UNCONTROLLED CROSSINGS: STRIPING AND SIGNAGE			
Treatment	**Description**	**Level**	**Estimated Cost**
3-4. In-Street Pedestrian Crossing Sign *Image Source: FHWA*	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.	**Level 1**	$400/EA

Source: Fehr & Peers, 2014.

TABLE D-14: UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
4-1. Pedestrian-Scale Lighting *Image source: www.ci.mil.wi.us*	Pedestrian-scale lighting improves visibility along a pedestrian's path and across driveways. It also improves visibility at pedestrian/vehicle conflict points in crosswalks.	**Level 1**	$10,000 per light assuming light every 100 feet

TABLE D-14: UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
4-2. Flashing Beacon *Image Source: Fehr & Peers*	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.	**Level 2**	$20,000/EA

TABLE D-14: UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
4-3. Rectangular Rapid Flashing Beacon (RRFB) *Image Source: Fehr & Peers*	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.	**Level 2**	$20,000/EA

TABLE D-14: UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
4-4. Pedestrian Hybrid Beacon (PHB) *Image Source: FHWA*	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.	**Level 3**	$80,000/EA

TABLE D-14: UNCONTROLLED CROSSINGS: BEACON, LIGHTING, AND SIGNAL TREATMENTS			
Treatment	**Description**	**Level**	**Estimated Cost**
4-5. Pedestrian Signal *Image Source: Fehr & Peers*	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.	**Level 4**	$250,000/EA

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:[15]

- 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

[15] 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.

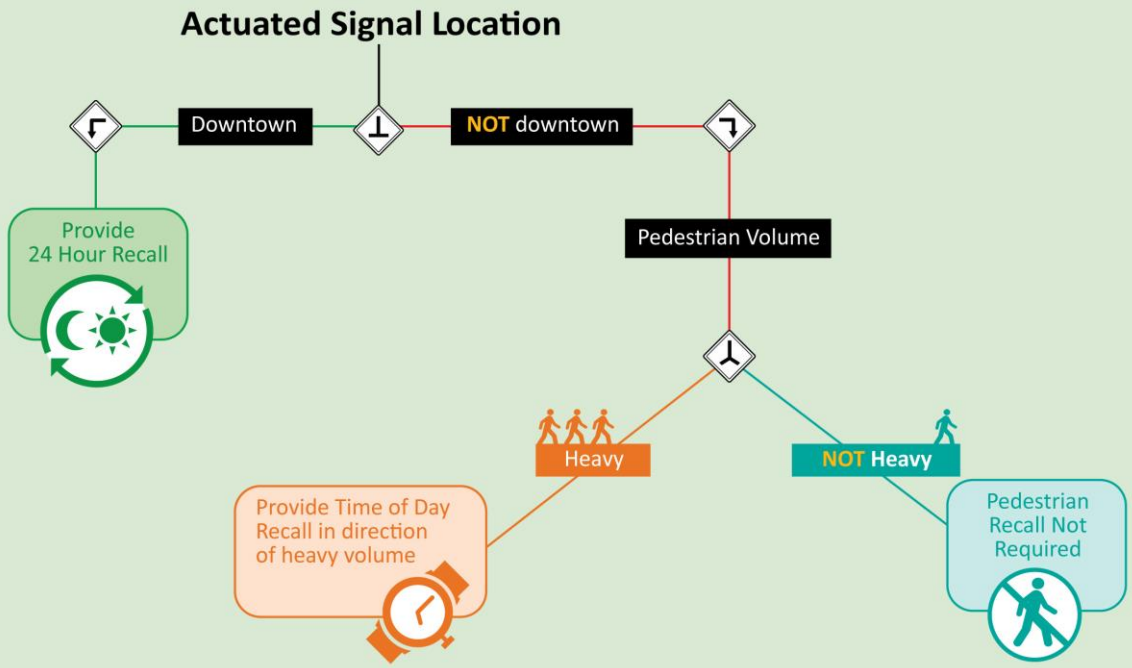
Intersection type and pedestrian conflict characteristics form the basis for completing Charts A, B, and C, and the applicable charts are then completed using existing and/or proposed intersection characteristics such as lane configurations, location along transit priority corridor, pedestrian and vehicle 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



*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.

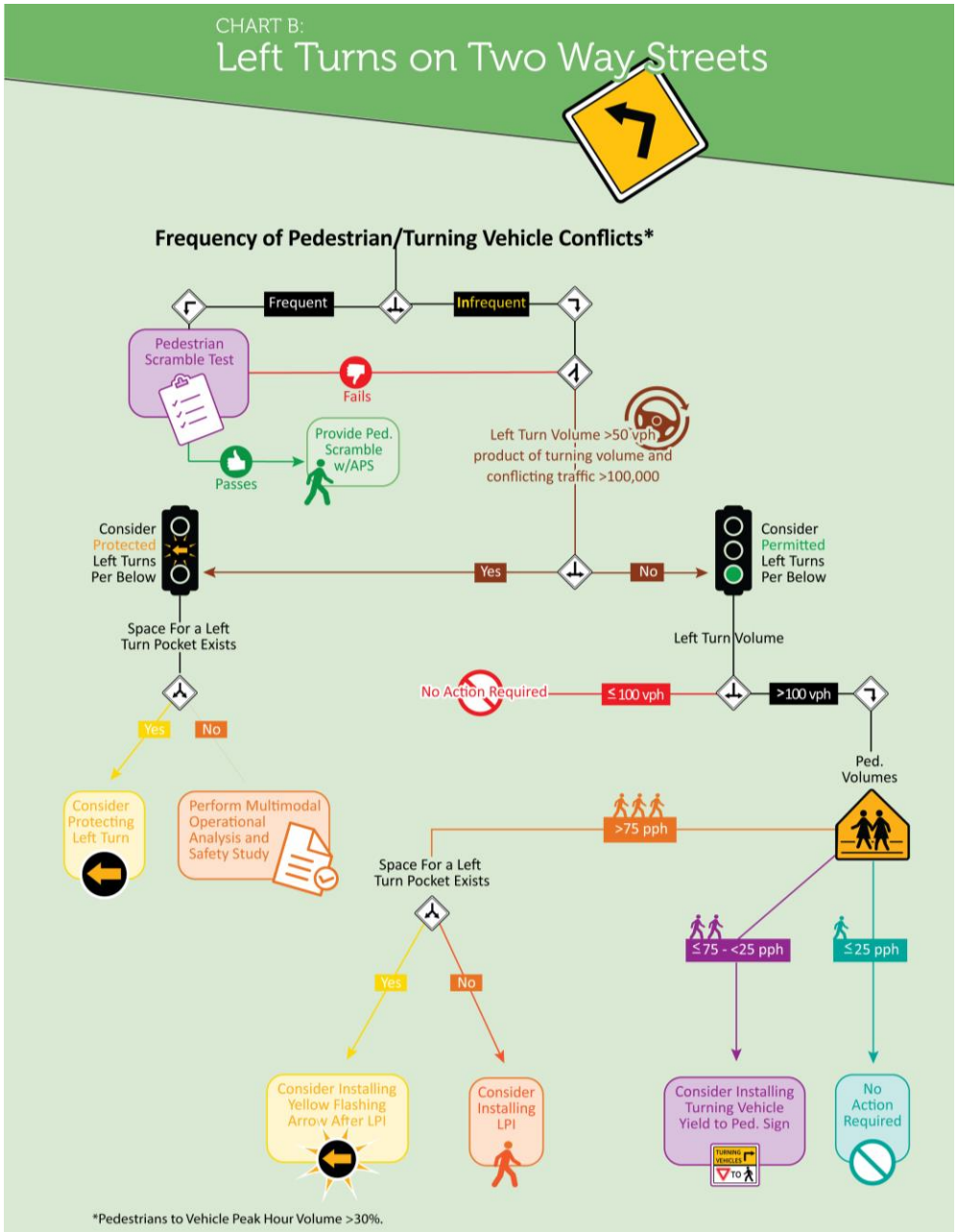


CHART B:
Left Turns on Two Way Streets
Frequency of Pedestrian/Turning Vehicle Conflicts*
Frequent
Infrequent
Pedestrian Scramble Test
Fails
Passes
Provide Ped. Scramble w/APS
Left Turn Volume >50 vph product of turning volume and conflicting traffic >100,000
Consider Protected Left Turns Per Below
Yes
No
Consider Permitted Left Turns Per Below
Space For a Left Turn Pocket Exists
Left Turn Volume
No Action Required
≤100 vph
>100 vph
Yes
No
Consider Protecting Left Turn
Perform Multimodal Operational Analysis and Safety Study
Ped. Volumes
>75 pph
Space For a Left Turn Pocket Exists
≤75 - <25 pph
≤25 pph
Yes
No
Consider Installing Yellow Flashing Arrow After LPI
Consider Installing LPI
Consider Installing Turning Vehicle Yield to Ped. Sign
No Action Required
*Pedestrians to Vehicle Peak Hour Volume >30%.

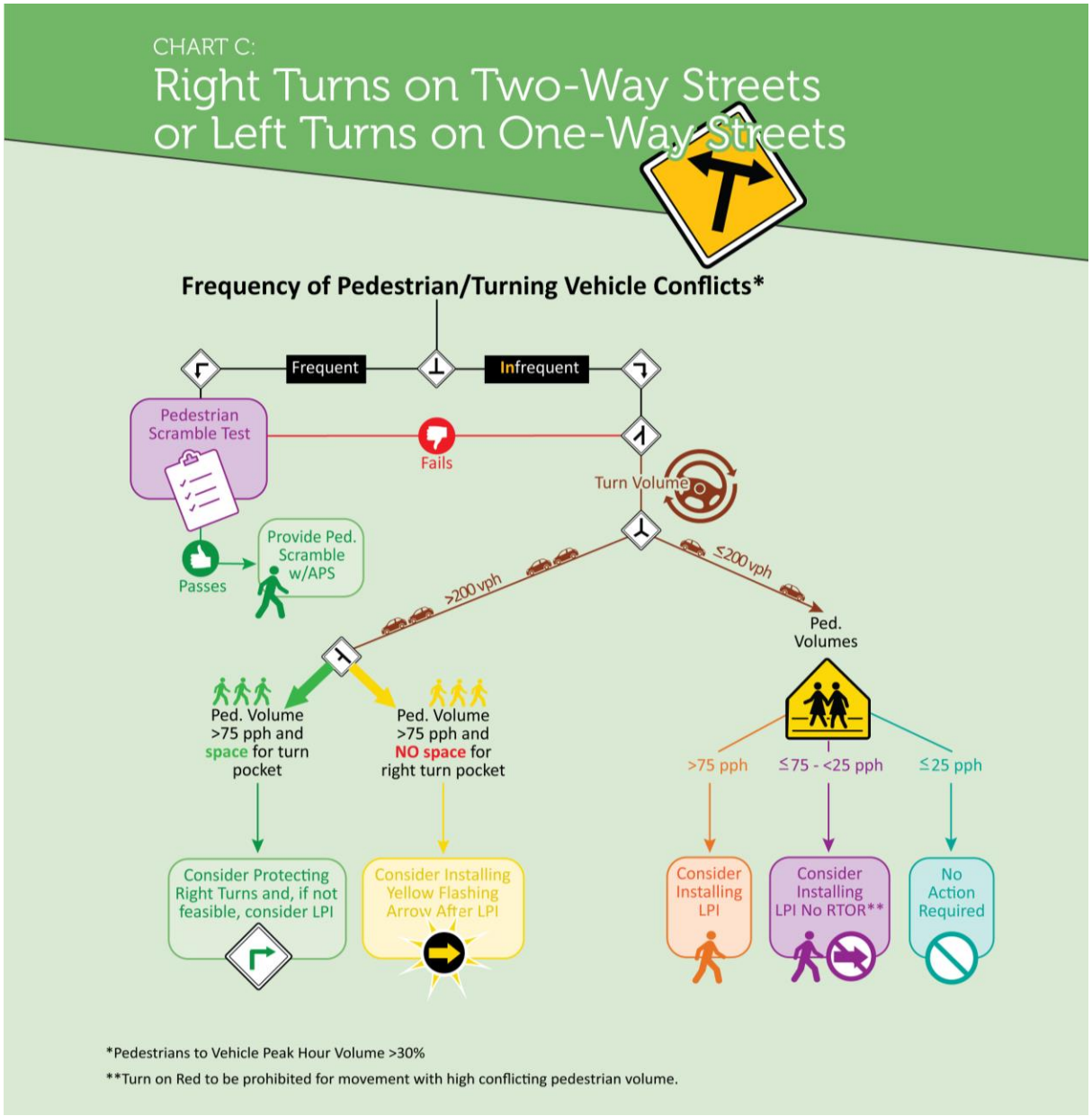


CHART C:
Right Turns on Two-Way Streets
or Left Turns on One-Way Streets
Frequency of Pedestrian/Turning Vehicle Conflicts*
Frequent
Infrequent
Pedestrian Scramble Test
Fails
Passes
Provide Ped. Scramble w/APS
Turn Volume
>200 vph
≤200 vph
Ped. Volume >75 pph and space for turn pocket
Ped. Volume >75 pph and NO space for right turn pocket
Ped. Volumes
>75 pph
≤75 - <25 pph
≤25 pph
Consider Protecting Right Turns and, if not feasible, consider LPI
Consider Installing Yellow Flashing Arrow After LPI
Consider Installing LPI
Consider Installing LPI No RTOR**
No Action Required
*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
No
Is the intersection located along a major transit corridor?
Yes
No
Can the diagonal crossing distance be less than 100 feet?
No
Yes
Can the cycle length be less than 100 seconds?
No
Yes
Perform multimodal operations analysis to consider a pedestrian scramble for all pedestrian phases.
Do NOT
Install Scramble

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 p eak hours when pedestrian volumes are higher.

2. Pedestrian Scramble with Accessible Pedestrian Signals (APS)
   - In three cities surveyed, used at intersections with complex geom etry 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) a nd 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. Re quires 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**
5-1. Fewer Travel Lanes ("Road Diet") *Image Source: Fehr & Peers*	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.

TABLE D-15: CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS	
Treatment	**Description**
5-2. Pedestrian Refuge Island with "Thumbnail" *Image Source: Fehr & Peers*	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.

TABLE D-15: CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS	
Treatment	**Description**
5-3. Removal of Sight-Distance Obstructions *Image Source: Fehr & Peers*	If objects impede sight-distance, an unsafe condition may arise where motorists and pedestrians are unable to see each other. Items such as parked cards, signage, landscaping, fencing, and street furniture should be placed in a location that will not obstruct sight-distance.

TABLE D-15: CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS	
Treatment	**Description**
5-4. Directional Curb Ramps with Truncated Domes *Image Source: Fehr & Peers*	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.

TABLE D-15: CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS	
Treatment	**Description**
5-5. Right-Turn Lane Design *Image Source: Fehr & Peers*	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 signalizing the crossing (especially if it is multi-lane) and designing the “pork-chop” for slower speeds and better visibility of pedestrians.

TABLE D-15: CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS	
Treatment	**Description**
5-6. Far-Side Bus Stops *Image Source: Fehr & Peers*	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.

TABLE D-15: CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS	
Treatment	**Description**
5-7. Curb Extensions *Image Source: Fehr & Peers*	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. The 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.

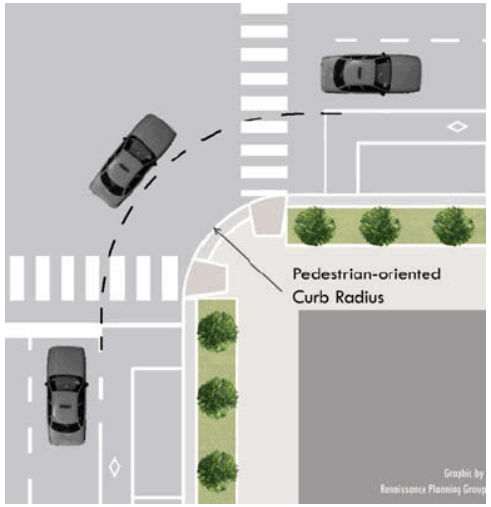
TABLE D-15: CONTROLLED INTERSECTIONS: GEOMETRIC TREATMENTS	
Treatment	**Description**
5-8. Reduced Turn Radius  *Image Source: AARP*	Vehicles travel faster through turns with a large radius. Reducing the radius of a corner is an effective way of reducing vehicle speeds. In suburban environments, turn 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.

TABLE D-16: CONTROLLED INTERSECTIONS: STRIPING AND SIGNAGE	
Treatment	**Description**
6-1. Marked Crosswalks *Image Source: Google Maps*	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. 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.

TABLE D-16: CONTROLLED INTERSECTIONS: STRIPING AND SIGNAGE	
Treatment	**Description**
6-2. Advanced Stop Bar *Image Source: Fehr & Peers*	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.

TABLE D-16: CONTROLLED INTERSECTIONS: STRIPING AND SIGNAGE	
Treatment	**Description**
6-3. High Visibility Markings *Image Source: Fehr & Peers*	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).

TABLE D-16: CONTROLLED INTERSECTIONS: STRIPING AND SIGNAGE	
Treatment	**Description**
6-4. Textured Pavement or Colored Crosswalks *Image Source: Fehr & Peers*	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.

TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-1. Adequate Crossing Times *Image Source: Fehr & Peers*	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.

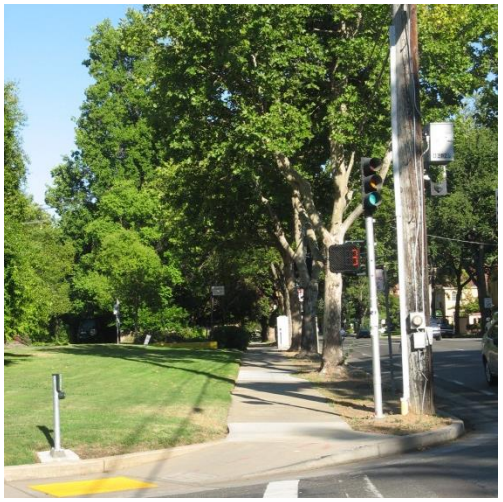
TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-2. Pedestrian Countdown Signal  *Image Source: Fehr & Peers*	Pedestrian countdown signals give pedestrians "Walk" and "Don't Walk" signals with a second-by-second countdown for each phase. Research 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.

TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-3. Pedestrian Signals and Push Buttons *Image Source: Fehr & Peers*	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 (≥60 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).

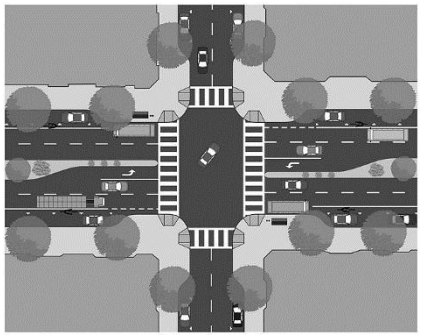
TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-4. Short Cycle Lengths  *Image Source: Institute of Transportation Engineers*	Long cycle lengths at signalized intersections result in long pedestrian wait times to cross a street. By shortening an intersection's cycle length, pedestrians do not have to wait as long to cross after pushing the button to request a "Walk" signal.

TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-5. Protected Left-Turns *Image Source: Fehr & Peers*	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.

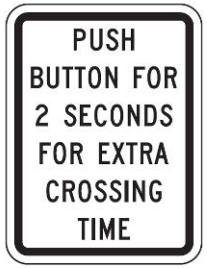
TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-6. Accessible Pedestrian Signals *Image Source: Fehr & Peers*	Accessible pedestrian signals (APS) and detectors provide information, such as "Walk" indications and direction of crossing, in non-visual 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 *Public Rights of Way Accessibility Guidelines* (PROWAG) is finalized.

TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-7. Pedestrian Recall *Image Source: Fehr & Peers*	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).
7-8. No Right Turn on Red *Image Source: FHWA*	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.

TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-9. Blank-Out Turn Restriction LED Sign *Image Source: Fehr & Peers*	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.

TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-10. Animated Eyes *Image Source: Fehr & Peers*	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.

TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-11. Leading Pedestrian Interval (LPI) *Image Source: Fehr & Peers*	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.

TABLE D-17: CONTROLLED INTERSECTIONS: SIGNAL HARDWARE AND OPERATIONAL MEASURES	
Treatment	**Description**
7-12. Push Button for Extended Crossing Time  *Image Source: FHWA*	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.

Source: Fehr & Peers, 2014.