Live Oak
Bicycle, Pedestrian & Trails Plan

Draft Plan
May 2016
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1. Introduction

The City of Live Oak has embraced a vision of the community where bicycling and walking serve the transportation needs of residents and visitors.

This Bicycle, Pedestrian, & Trails Plan carries this vision forward, outlining a strategy to develop a safer, more comfortable walking and bicycling network with support facilities, and foster a thriving active transportation culture through programs and events.

This Plan envisions a network that supports walking and bicycling for both transportation and recreation where residents of all ages and abilities can choose to walk or bike. It focuses on improving access to schools and parks in the community, and to connect and support vibrant commercial corridors along Broadway and Live Oak Boulevard. The Plan also identifies improvements for crossing and navigating the Union Pacific Railroad line and Highway 99, improving connections between the east and west sides of the community.

In addition to the network, this Plan helps to provide a level of comfort to people walking and biking through wayfinding signs and maps, as well as pedestrian amenities and secure places to park bicycles.

The bicycle and pedestrian networks are complemented by programs designed to educate and encourage all residents about walking, bicycling, and sharing the road safely, and enforcing good behavior for all road users. Evaluation programs will keep implementation on track by documenting progress towards this Plan's goals.

With this ambitious vision before us, the City will continue to cultivate a network of partners in the community and region dedicated to advancing bicycling, walking, and transit use. Citizen groups, private developers, funding agencies, and others must come together to transform Live Oak and create a legacy of active, healthy transportation options for generations to come.

Purpose of the Plan

This Bicycle, Pedestrian, & Trails plan provides a strategy for the development of a comprehensive bicycling and walking network throughout Live Oak, as well as a strategy for support facilities and education, encouragement, enforcement, and evaluation programs.

This Plan documents what walking and bicycling is like now in Live Oak, reasons for improvements, and a strategy to make the city safer and more comfortable to bicycle and walk for recreation and transportation for people of all ages and abilities.

Planning Process and Public Improvement

Live Oak encouraged residents to provide input at all stages of development for this Plan, to ensure it truly reflects the needs and priorities of the community. Two public workshops were held to gather input on community challenges, and to review the draft recommendations included in this Plan.

Active Transportation Program Compliance

This plan complies with the Active Transportation Program (ATP) guidelines, making Live Oak eligible to receive ATP funding upon approval of this Plan by a regional transportation planning agency. See Appendix E for a reference compliance table.

Plan Organization

This plan is organized as follows:

- Chapter 1: Introduction
- Chapter 2: Existing Conditions
- Chapter 3: Needs Analysis
- Chapter 4: Vision, Goals, and Policies
- Chapter 5: Project Recommendations
- Chapter 6: Program Recommendations
- Chapter 7: Implementation Plan

In addition, appendices provide background information or additional detail relevant to this plan. These include:

- Appendix A: Plan and Policy Review
- Appendix B: Design Guidelines
- Appendix C: Project List
- Appendix D: Funding Sources
- Appendix E: Active Transportation Program Compliance

2. Live Oak Now

The Live Oak Bicycle, Pedestrian & Trails Plan includes the City of Live Oak in addition to its sphere of influence as defined by the General Plan. Live Oak is a small city in northern Sutter County, however it is the second largest in the county after Yuba City. Live Oak lies on Highway 99 between the Sutter Buttes and the Feather River in the Sacramento Valley.

Land Use

Much of the developed area in the community is single-family residential uses, with intermittent civic uses and open space. The community is surrounded by agricultural land and rural residential uses. Retail and commercial uses are largely concentrated along Highway 99, called Live Oak Boulevard within the community, and Broadway. See **Figure 2-1** for a map of land uses in Live Oak.

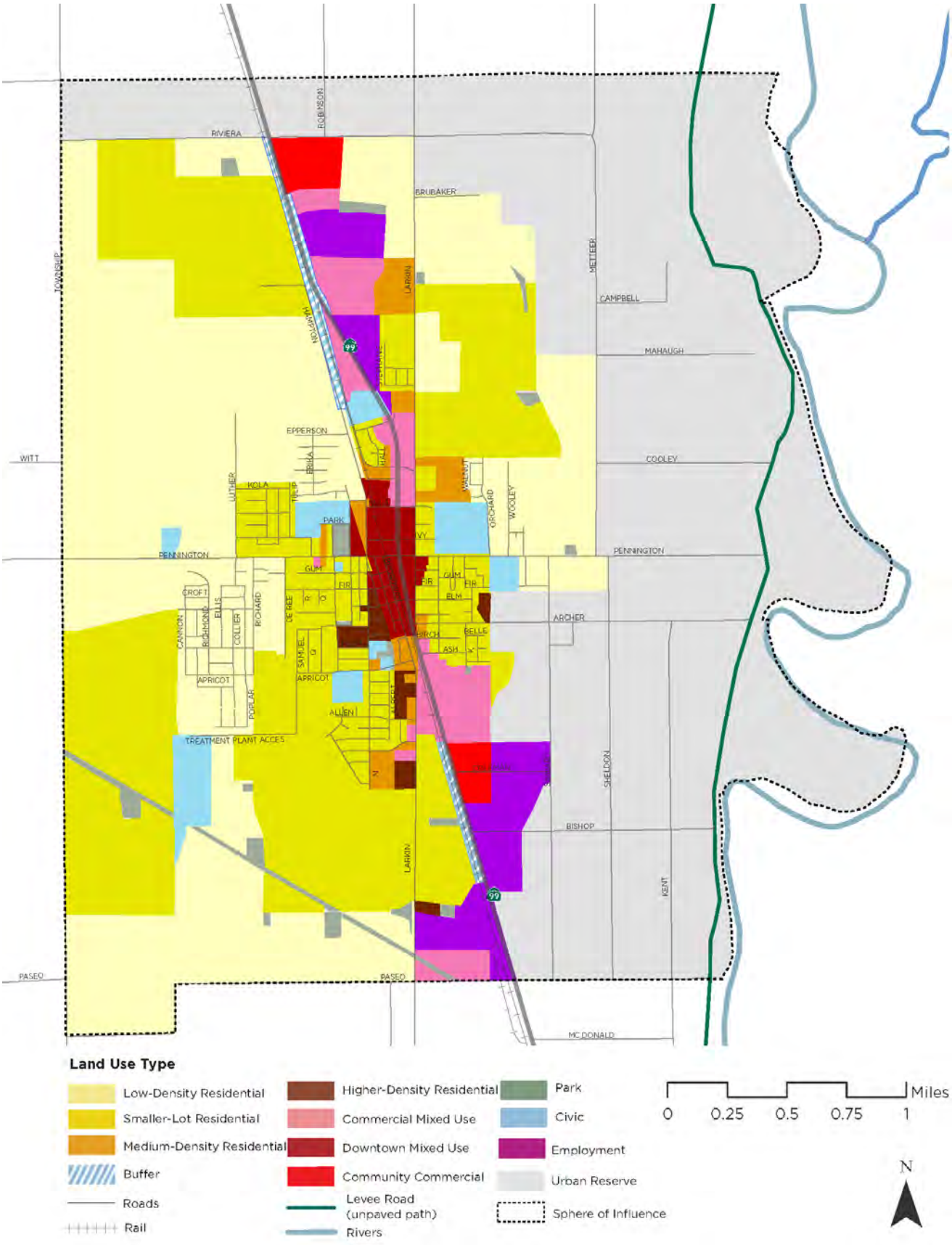


Figure 2-1: Land Use

Walking and Bicycling Attractors and Generators

Community destinations like schools, parks, and commercial centers can be popular destinations for bicyclists and pedestrians. These activity generators are mapped in **Figure 2-2.**

Schools

Live Oak is served by the Live Oak Unified School District, which includes four schools in the Live Oak planning area:

- Luther Elementary School (K-4)
- Live Oak Middle School (5-8)
- Live Oak High School (9-12)
- Live Oak Alternative Schools (K-12)

Live Oak Alternative Schools includes an independent study program and a continuation high school, which shares a campus with Live Oak High School.

Encinal School is also part of the Live Oak Unified School District, but lies outside the sphere of influence of this planning effort.

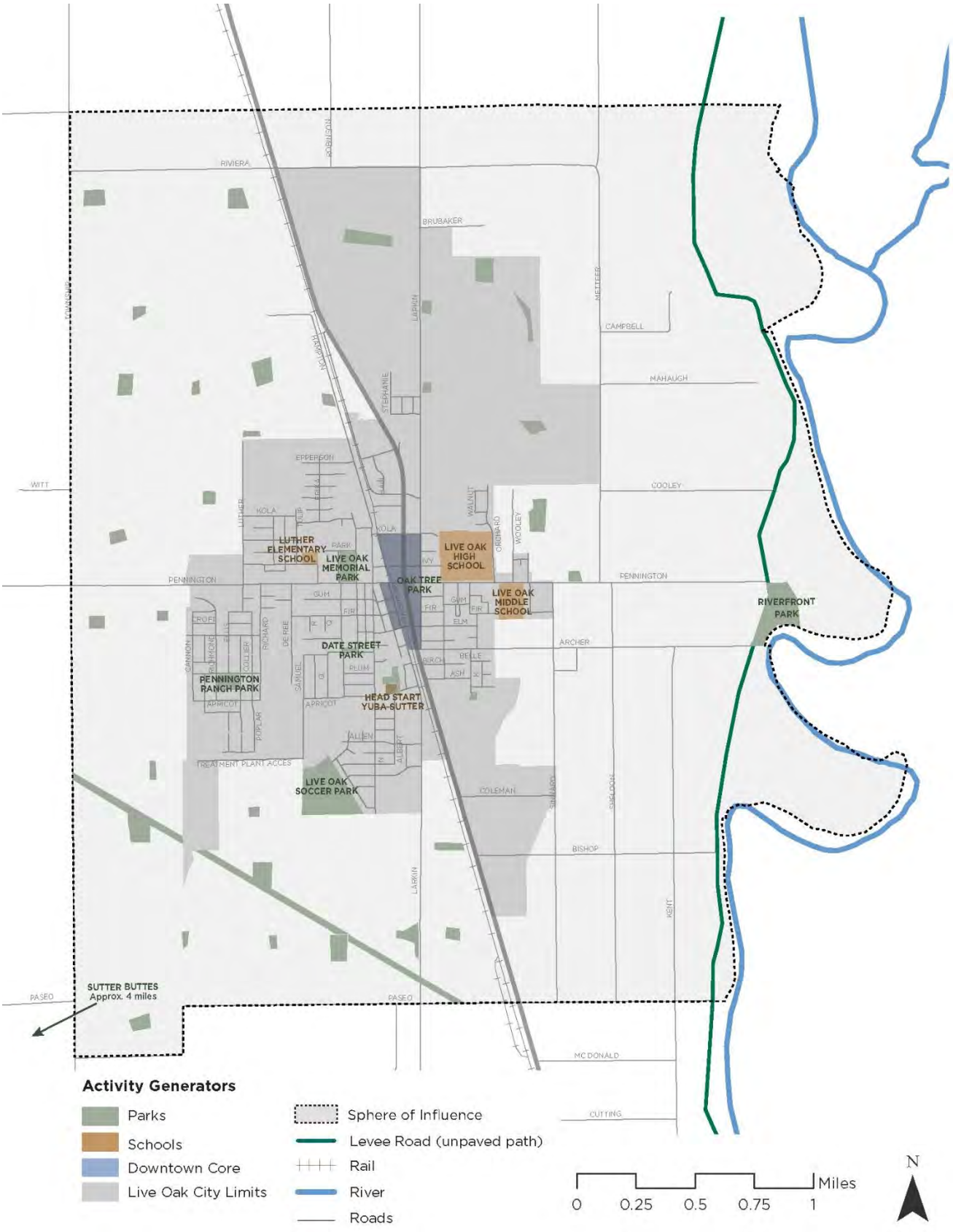


Figure 2-2: Activity Generators

Parks

Live Oak has five parks, which are popular destinations for people walking and bicycling:

- Date Street Park
- Live Oak Memorial Park
- Live Oak Soccer Park
- Oak Tree Park
- Pennington Ranch Park

A Live Oak Bike and Skate Park is also planned for the community.

Live Oak River Front Park, which lies west of the city on Pennington Road, may also be a destination for people on bicycles.

The Sutter Buttes to the west of Live Oak are a popular bicycling area, with many residents and visitors participating in annual "Bike Around the Buttes" events.

Retail and Commercial Centers

Live Oak's downtown core is located on Highway 99 and Broadway from Kola Street to Archer Avenue. The downtown historic district is west of the railroad line adjacent to Highway 99.

Demographics

Live Oak has a population of 8,488 according to the 2014 Census Population Estimate. The community has remained relatively steady over the past five years, as shown in **Figure 2-3**.

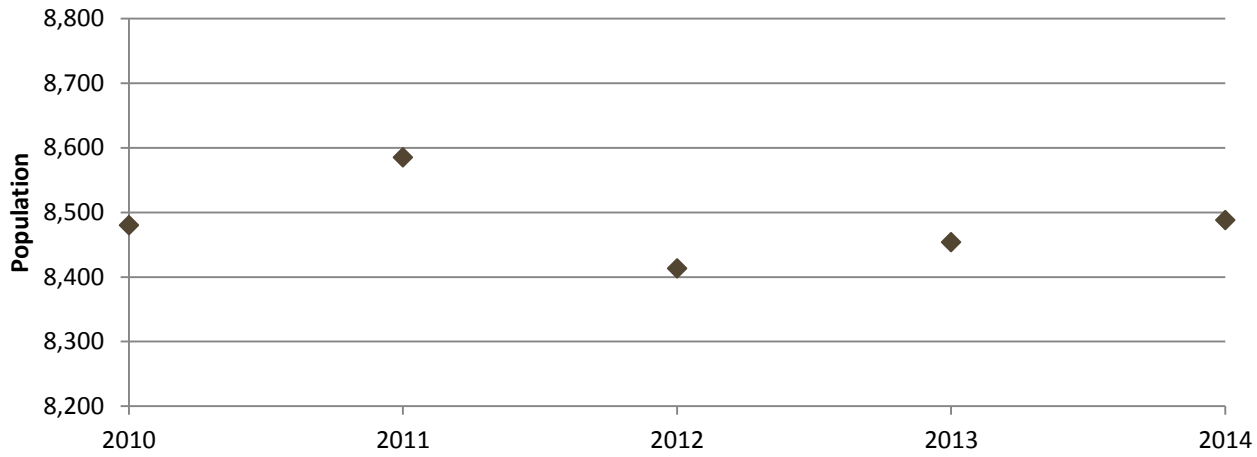


Figure 2-3: Population

Nearly 30 percent of Live Oak residents are under 18 years old. Population is distributed fairly evenly across remaining age groups, as shown in **Figure 2-4**.

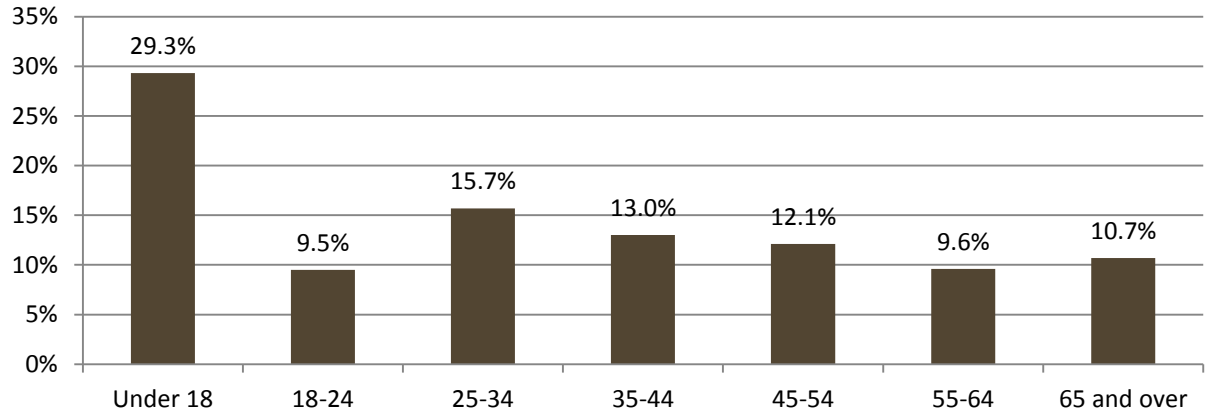


Figure 2-4: Age Distribution

Commute Patterns

Census data provides local information on the number and percent of workers commuting to work by bicycle and on foot, and can be used to compare trends and differences between jurisdictions.

According to American Community Survey 2013 5-year estimates, 1.1 percent of workers in Live Oak walk to work. No workers currently bicycle to work. Driving alone is the most popular mode of transportation for commuters at 73.1 percent, followed by carpooling at 22.2 percent. See **Figure 2-5**.

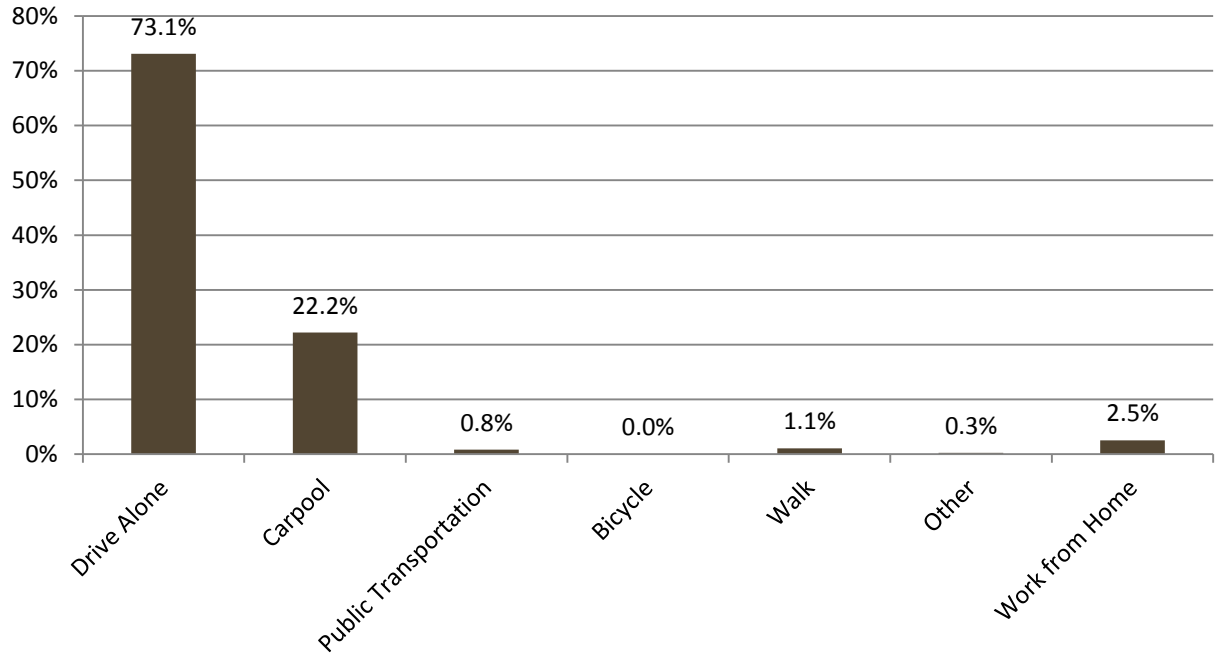


Figure 2-5: Mode of Transportation to Work

Transit

Yuba-Sutter Transit provides transit service in Live Oak, with one route that operates three times per day, five days per week between 7:00 a.m. and 7:00 p.m. In Live Oak, bus stops are located at:

- Ash Street & Highway 99
- Maple Park Neighborhood Center
- Pennington Road & O Street
- Richard Avenue & Presley Avenue
- Date Street & O Street
- Butte View Estates

On-demand pickup or dropoff are also available from any address in Live Oak. In addition to local stops, the route connects to Yuba College Sutter County Center, Alturas & Shasta terminal in Yuba City, and the Yuba County Government Center.

All Yuba-Sutter Transit buses are equipped with racks that accommodate two bicycles. Bicycles are not permitted inside most buses. Exceptions are made for the last bus of the day on fixed local routes, allowing bicycles on board if the rack is already full.

Walking and Bicycling Conditions

Live Oak has many qualities that make it ideal for walking and bicycling. It is a small community, with homes and destinations close enough to walk or bicycle. The terrain is flat, and the Mediterranean climate makes active transportation comfortable for much of the year. The walking and bicycling conditions in Live Oak are influenced by a semi-disconnected street network, and by Highway 99 and the Union Pacific Railroad line which run north-south through the center of the community.

Bikeways

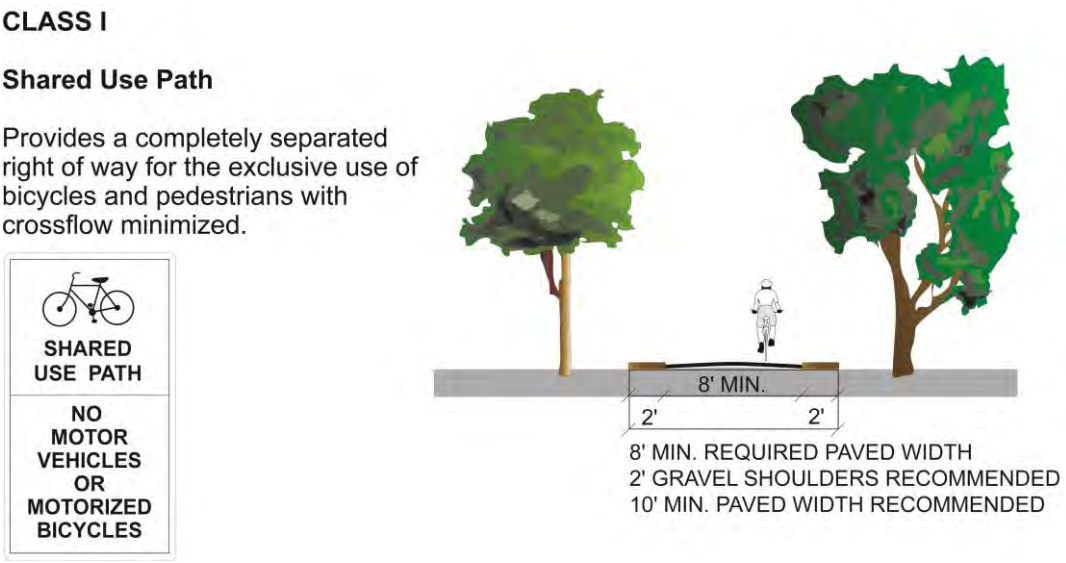
Caltrans designates three 'classes' of bikeways that vary in the level of separation from motor vehicles that they provide. Live Oak has a total of 1.7 miles of bikeways, as shown in **Table 2-1**.

Table 2-1: Summary of Existing Bikeway Miles

Bikeway Class	Total Miles
Class I	0.5
Class II	1.2
Class III	-
Total	***1.7***

A Class I Shared Use Path provides for bicycle and pedestrian travel on a paved right-of-way completely separated from streets or highways. Two Class I shared-use paths exist in Live Oak, along O Street from Kola Street to Pennington Road, and between N Street and Center Street from Elm Street to Apricot Street. Both segments are phases of the Live Oak Community Trail.

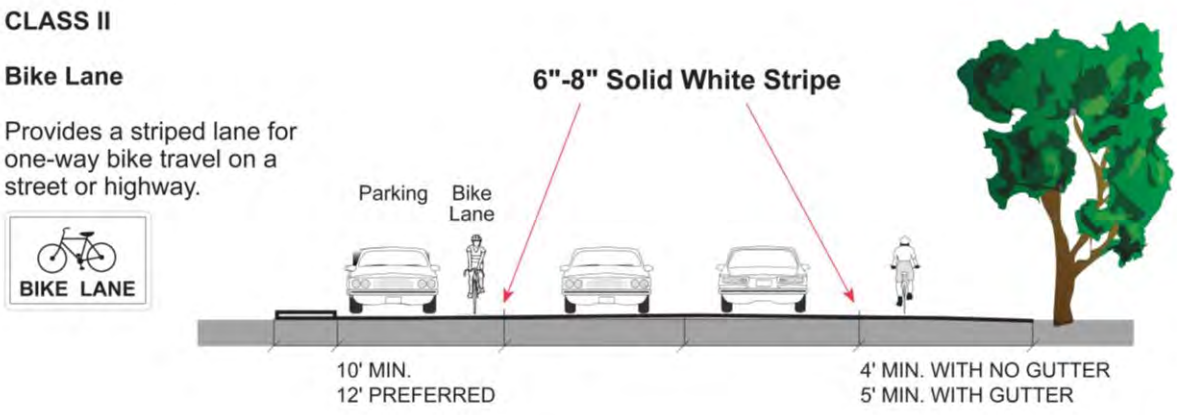
Short segments of Class I paths also provide bicycle and pedestrian connectivity between cul-de-sacs or otherwise disconnected streets in some Live Oak neighborhoods. These are identified on maps in this Plan as "Neighborhood Connectors."



Class I Shared Use Path

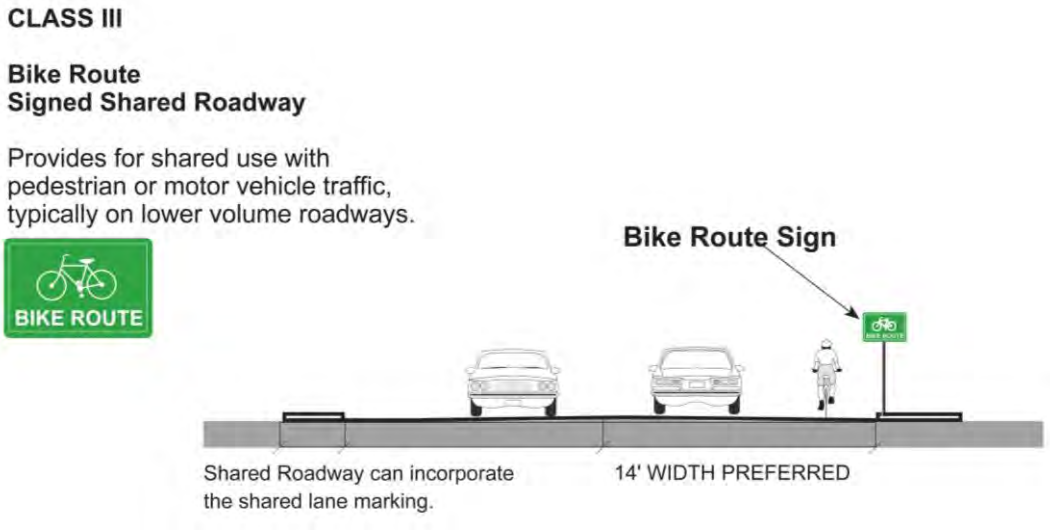
Class II Bike Lanes provide a signed, striped and stenciled lane for one-way travel on both sides of a roadway. Bicycle lanes are often recommended on roadways where traffic volumes and speeds are too high for comfortably sharing the travel lane. There are four segments of Class II bicycle lanes in Live Oak:

- Pennington Road from Connecticut Avenue to Broadway
- Larkin Road from Pennington Road to Elm Street
- N Street from Allen Street to Ida Street
- P Street from Pennington Road to Apricot Street



Class II Bike Lane

Class III Bike Routes provide for shared travel lane use and are generally only identified with signs. Bike routes may have a wide travel lane or shoulder that allow for parallel travel with automobiles. They may also be appropriate on low volume, low speed streets. No Class III bike routes were identified in Live Oak.



Class III Bike Route

An unpaved maintenance road along the top of the levee east of Live Oak is currently used as a walking and bicycling path by community members.

For a map of existing bicycle facilities in Live Oak, see **Figure 2-6**.

Bike Support Facilities

Bicycle parking is available on campus at Luther Elementary School, Live Oak Middle School, and Live Oak High School. Bicycle racks are also located at Memorial Park, and the Live Oak Soccer Park. No public showers or locker facilities have been documented.

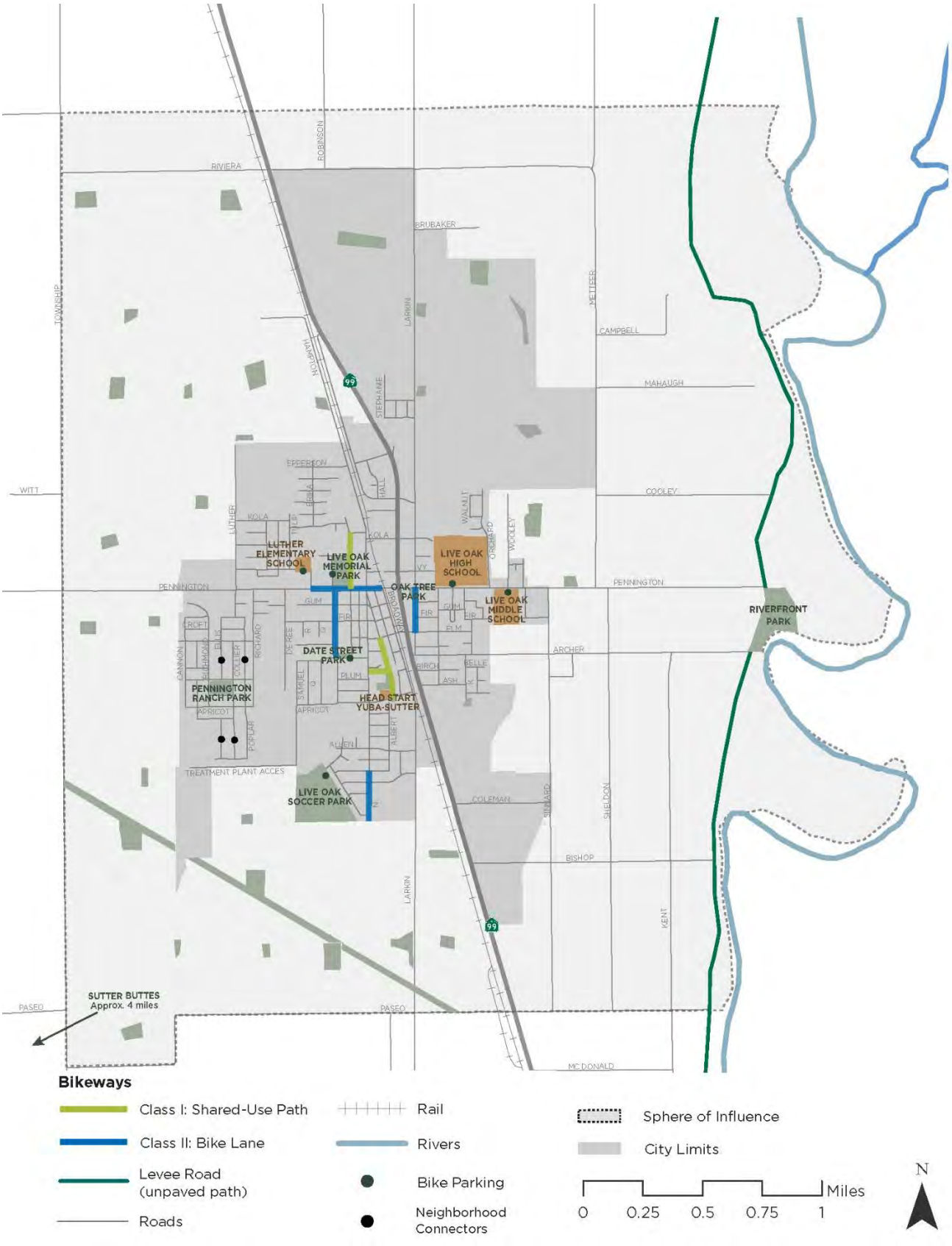
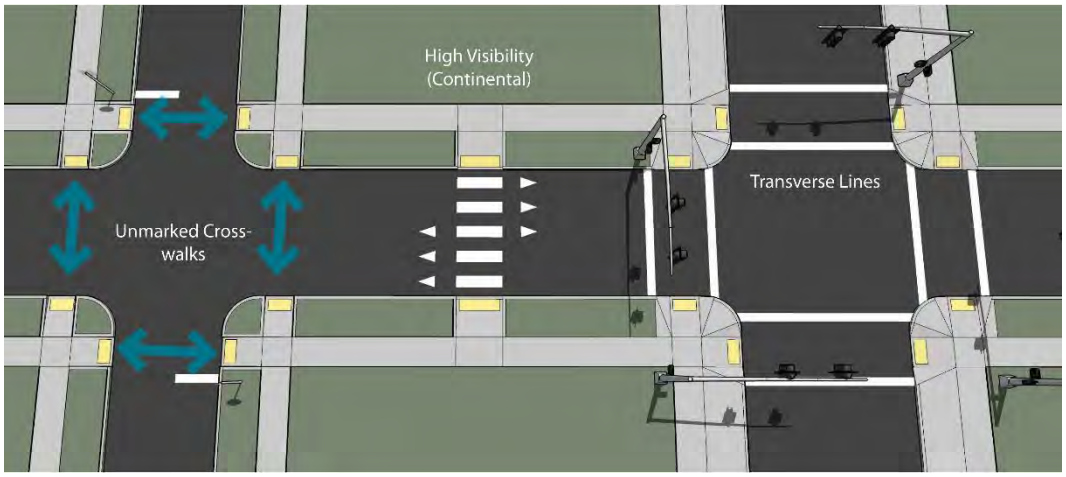


Figure 2-6: Existing Bicycle Facilities

Walking Facilities

Sidewalks in Live Oak are present on both sides of most major roads, but many gaps in the pedestrian network exist in residential neighborhoods. Highway 99 has intermittent sidewalks. Sidewalks are generally adjacent to the curb, although some properties have a landscaped buffer strip between pedestrians and the roadway. For a map of sidewalks, see **Figure 2-7**.

Marked crosswalks use transverse lines on minor crossings, and high-visibility continental markings on major roads. Crosswalk markings near schools are yellow.



Crosswalk Marking Types

Rolled curbs are common in residential areas, while most major roads have vertical curbs. Along Broadway, some curbs are taller than six inches, which may present difficulty for pedestrians with mobility impairments. It also requires particular attention to curb ramp design to accommodate a greater elevation change.

Rolled Curb vs Vertical Curb

Programs

Rail Safety Poster Contest
The City offers an annual poster contest in local schools, inviting students to submit artwork that reflects the importance of railroad safety. Winning artwork is displayed on a billboard near the community.

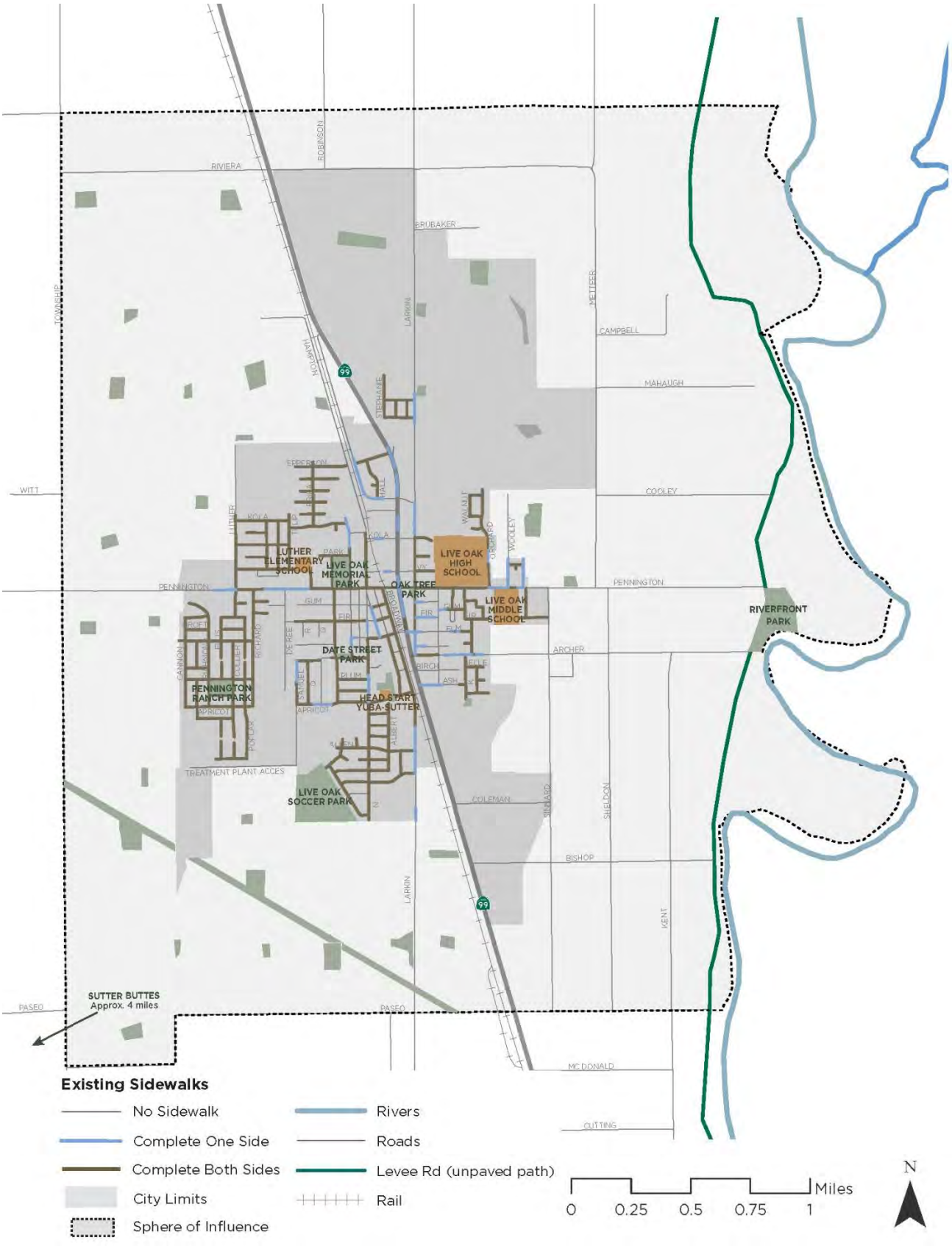


Figure 2-7: Sidewalk Inventory

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3. Needs Analysis

This chapter outlines a need for walking and bicycling related improvements in Live Oak through an analysis of collision data and community desires expressed in a public workshop.

Collision Analysis

This section reviews collision data from the Statewide Integrated Traffic Records System (SWITRS), a statewide repository of collision reports submitted by local enforcement agencies. While collision data are sometimes incomplete and do not capture 'near misses,' they do provide a general sense of the safety issues facing pedestrians and bicyclists in Live Oak. Five years of data were evaluated, from 2009 to 2013.

Bicycle-Involved Collisions

For a map of bicycle-involved collisions, see **Figure 3-1**.

Figure 3-1: Bicycle-Involved Collisions

Total Collisions

There were a total of nine bicycle-involved collisions in Live Oak during the study period, shown in **Figure 3-2**. While nine bicyclists were involved in these collisions, only four sustained injuries and were reported as victims.

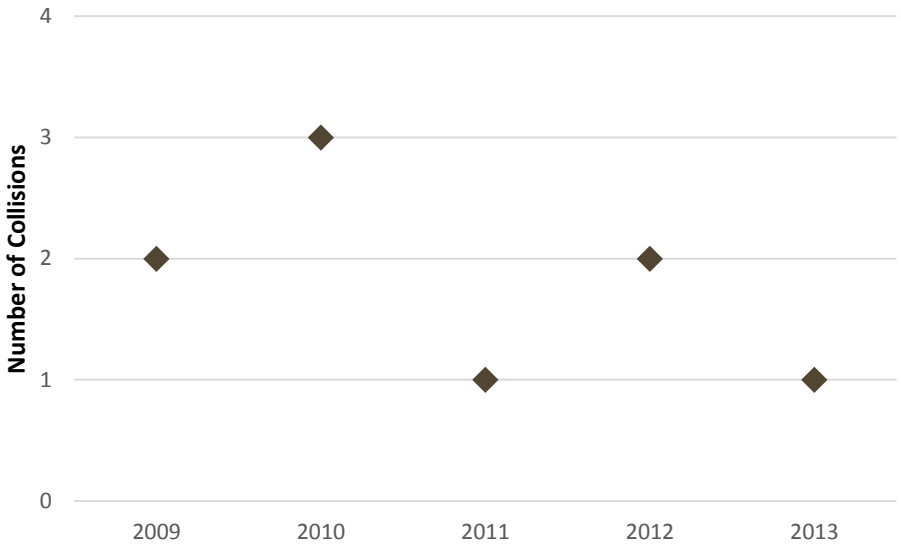

Figure 3-2: Annual Bicycle-Involved Collisions

Across the entire study period, bicycle-involved collisions accounted for three percent of all reported collisions in Live Oak, whereas five percent of all Live Oak collisions in 2010 involved bicyclists.

Top Collision Locations
Two corridors in Live Oak had relatively high numbers of bicycle-involved collisions reported during the study period. Pennington Road had five collisions, and four collisions occurred on Highway 99. Two collisions occurred at the intersection of the two corridors.

Age
The four injured bicyclists were 12, 16, 18, and 33 years old, respectively.

Injury Severity
Two of the bicyclists involved in collisions had some visible injury, and two had no visible injuries but complained of pain.

Fault and Contributing Factors
Bicyclists were determined to be at fault in two-thirds of the reported collisions, as shown in Figure 3-3.

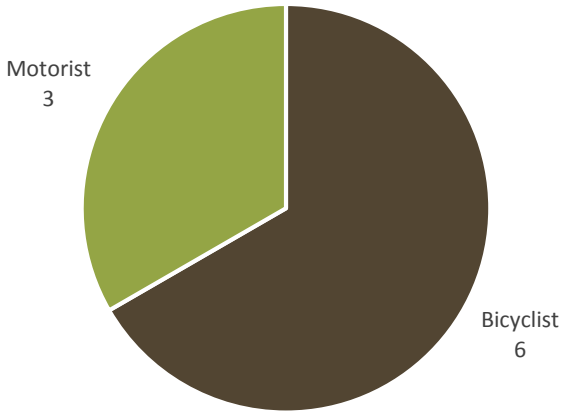

Figure 3-3: Determination of Fault in Bicycle-Involved Collisions

The most common violation that resulted in a collision was bicyclists riding on the wrong side of the road, as shown in **Table 3-1**. This behavior may indicate a lack of bicycle facilities along desired paths of travel, or a need for additional bicyclist education in the community.

Table 3-1: Violation Categories for Bicycle-Involved Collisions

Collision Factor	Party at Fault	
	Bicyclist	Motorist
Wrong side of road	3	1
Violated automobile right-of-way	1	1
Violated pedestrian right-of-way	1	
Driving or bicycling under the influence of drugs or alcohol	1	
Unsafe speed		1

Movement Preceding Collision

Bicyclists were most commonly proceeding straight when collisions occurred, while motorists were most commonly making right turns. Additional movements preceding collisions are listed in **Table 3-2**.

Table 3-2: Movement Preceding Bicycle-Involved Collisions

Movement	Bicyclist	Motorist
Proceeding straight	5	2
Making right turn		3
Making left turn	1	2
Stopped	1	2
Traveling wrong way	1	
Other/Not Stated	1	

Pedestrian-Involved Collisions

For a map of pedestrian-involved collisions, see **Figure 3-5**.

Total Collisions

There were a total of 13 pedestrian-involved collisions in Live Oak during the study period. Twice as many collisions occurred in 2011 than in any other year during the study period, as shown in **Figure 3-4**. While 15 pedestrians were involved in the collisions, only 13 sustained injuries and were classified as victims.

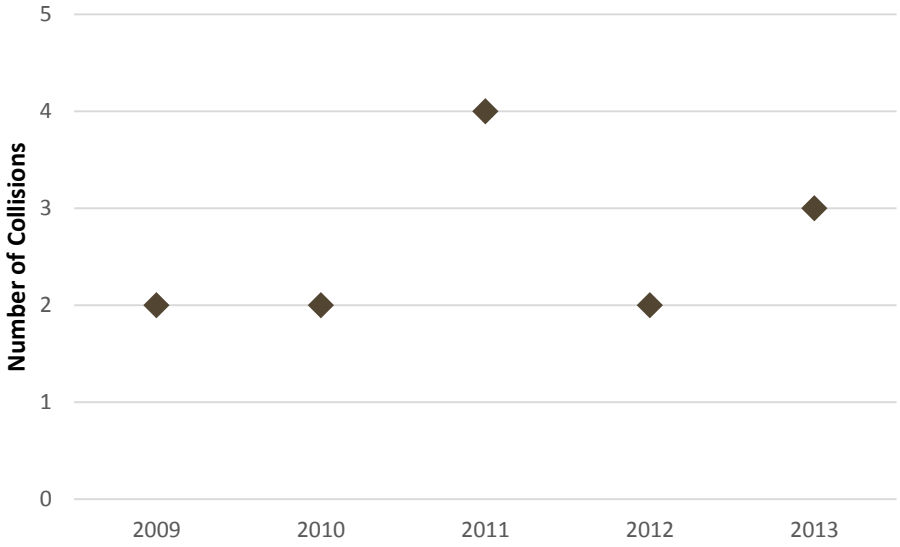

Figure 3-4: Annual Pedestrian-Involved Collisions

Across the entire study period, pedestrian-involved collisions accounted for four percent of all reported collisions in Live Oak, whereas seven percent of all Live Oak collisions in 2011 involved pedestrians.

Figure 3-5: Pedestrian-Involved Collisions

Top Collision Locations

Three corridors in Live Oak had relatively high numbers of pedestrian-involved collisions during the study period, including many collisions at the intersections of these corridors, as shown in **Table 3-3**.

Table 3-3: Top Pedestrian-Involved Collision Corridors

Street or Intersection	Collisions
Elm Street and Highway 99	4
Pennington Road and Highway 99	2
Elm Street (elsewhere)	1
Pennington Road (elsewhere)	5

Pennington Road had the highest number of pedestrian-involved collisions overall, with seven collisions occurring during the study period. Six collisions occurred along Highway 99, and five occurred along Elm Street. The intersection of Elm Street and Highway 99 had the highest number of collisions of any intersection during the study period, with four collisions.

Age

Six of the 13 injured pedestrians are under 16 years old, and two were over 70 years old. This may indicate a need for pedestrian facilities that support walking at all ages, especially for young and old pedestrians who may walk more slowly or have difficulty judging speed of oncoming traffic.

Injury Severity

Two pedestrians were severely injured in collisions during the study period. The remaining eleven pedestrians suffered minor injuries, as shown in **Figure 3-6**.

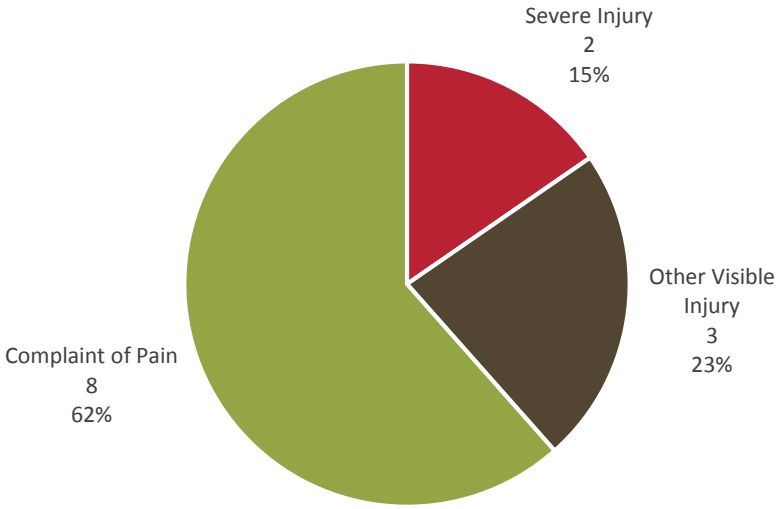

Figure 3-6: Pedestrian Injury Severity

Fault and Contributing Factors

Pedestrians were found to be at fault for only two of 13 collisions, as shown in **Table 3-4**. The most common violation that resulted in a collision was a motorist failing to yield to a pedestrian appropriately.

Table 3-4: Violation Categories in Pedestrian-Involved Collisions

Collision Factor	Party at Fault		
	Pedestrian	Motorist	Not Stated
Violated pedestrian right-of-way		6	1
Pedestrian violation	2		
Unsafe speed			1
Unsafe starting or backing		1	
Other/Not Stated			2

Movement Preceding Collision

Both motorists and pedestrians were most commonly proceeding straight when collisions occurred, as shown in **Table 3-5**.

Table 3-5: Movement Preceding Pedestrian-Involved Collisions

Movement	Pedestrian	Motorist
Proceeding straight	8	7
Making right turn		3
Making left turn		3
Other/Not Stated	7	

Pedestrians were most commonly crossing in crosswalks at intersections when collisions occurred, as shown in **Table 3-6**.

Table 3-6: Pedestrian Action

Pedestrian Action	Number
Crossing in crosswalk at intersection	8
Crossing not in crosswalk	4
In road, including shoulder	1

Community-Identified Needs

Community input on walking and bicycling challenges in Live Oak was collected at a public workshop held September 24, 2015. The workshop was attended by members of the community, including high school students and elected officials. Key themes identified during the workshop include:

- Need for education and encouragement programs at local schools
- Need for walking and bicycling connections to community destinations including the city pool and soccer park
- Lack of safe, comfortable crossings of Highway 99 and the Union Pacific Railroad line, specifically at:
    - Elm Street
    - Pennington Road
    - Ramsdell Drive/Epperson Way
- Need for walking and bicycling improvements along Broadway in the downtown area
- Opportunity to create bicycle path connection to Yuba City by utilizing the levee road

See **Figure 3-7** for a map of community-identified challenge areas.

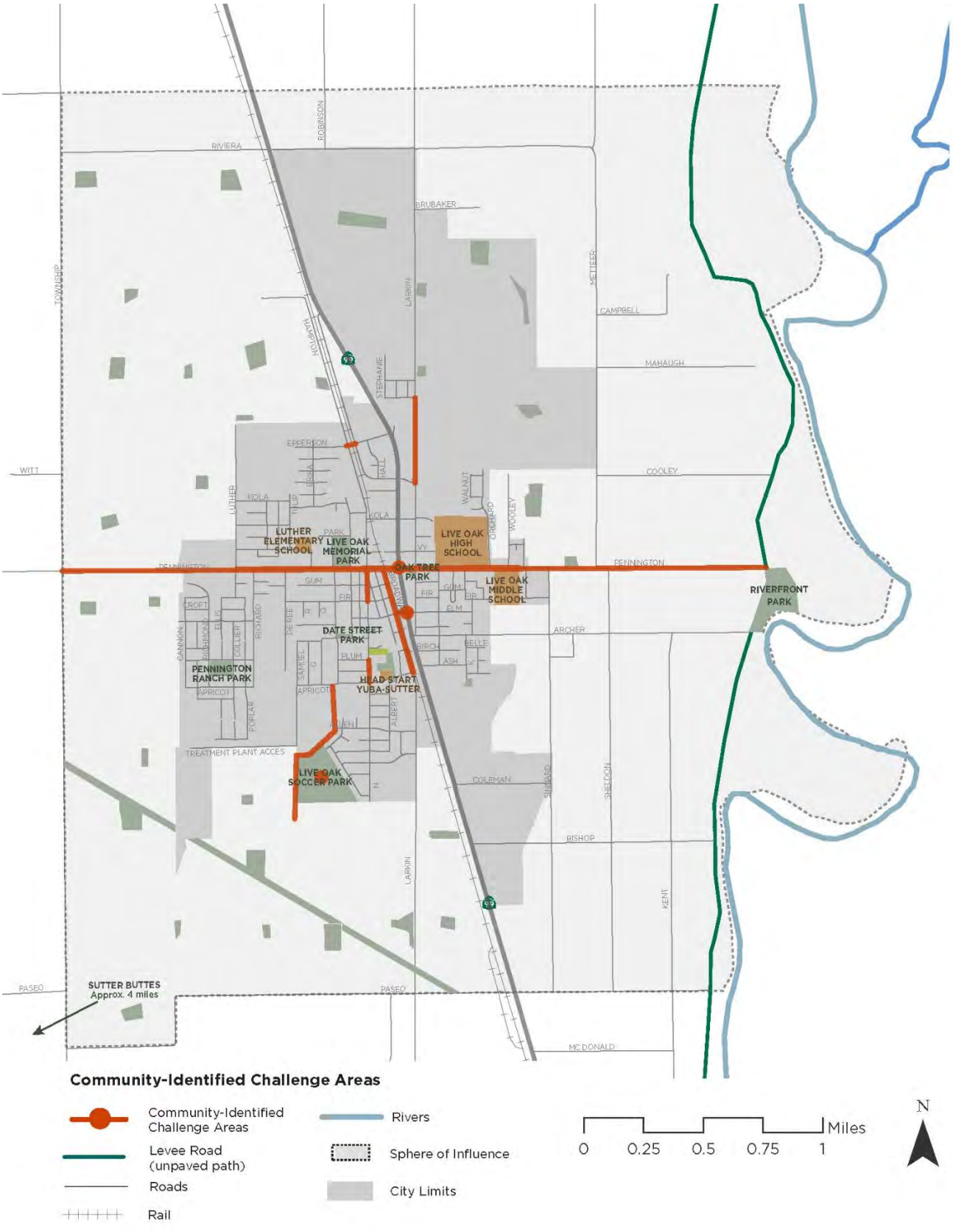

Figure 3-7: Community-Identified Challenge Areas

Summary of Needs

Based on crash analysis and community input, the following key community needs were identified for Live Oak:

Create an Accessible Pedestrian Network

While Live Oak has sidewalks through much of the city, closing the gaps that exist and updating accommodations for pedestrians with mobility impairments will benefit pedestrians and support walking as an affordable transportation option.

Create a Bikeable Street Network

Many of the safety challenges and community concerns related to an incomplete bicycle network, leading to bicyclists riding the wrong way, motorists being unsure where to expect bicyclists, and some residents choosing another transportation mode because of their concerns.

Improve Connections Across Highway and Railroad

Highway 99 and the railroad create barriers for bicycle and pedestrian travel today. Improving existing crossings or creating new crossings will require coordinating with other agencies, but may result in significant increases in people walking and bicycling.

Improve Access to the Levee Path

The levee path could become an important regional and community destination, but there are no walking or bicycling facilities connecting residents to it and there is currently no public access along the route.

Provide Education for Bicyclists, Pedestrians, and Drivers

Education programs teach bicyclists and pedestrians how to walk and bike safely, and can share information about available routes or resources. They also seek to educate motorists about the rights of bicyclists and pedestrians, and how to share the road safely.

Opportunities and Constraints

Based on analysis of historic collision data, field review of existing conditions, and community input received at a public workshop, the following constraints and opportunities to improve walking and bicycling in Live Oak were identified:

Opportunities

- Live Oak is a walking community, with high levels of walking already
- Providing access to schools
- Levee road creates opportunity for walking and bicycling trail to Yuba City
- Pennington Road is a key east-west corridor for both local and regional destinations
- Compact community form places destinations within walking distance of home, school, or work

Constraints

- Limited right-of-way on key arterial connections
- Highway 99 and the rail line create challenges for east-west travel
- Lack of bicycle and pedestrian education programs
- History of safety challenges on Pennington Road, Highway 99/Live Oak Boulevard, and Elm Street

4. Vision & Goals

The Live Oak Bicycle, Pedestrian & Trails Plan will guide the development and implementation of walking and bicycling improvements for years to come. The foundation for recommendations and improvement strategies are directly informed by this Plan's Vision, Goals, Objectives, and Policies.

A ***vision*** is a broad inspirational statement for the desired future state.

Goals are general statements of what the City and residents hope to achieve over time.

Objectives are more specific statements that mark progress towards the goal.

Policies are actions that guide the City to achieve the objectives and goals.

Vision

> *The City of Live Oak envisions a walking and bicycling environment that supports active living, provides for safe and healthy transportation, and enables people of all ages and abilities to access jobs, school, recreation, shopping, and transit on foot or by bicycle as a part of daily life.*

Goals, Objectives, and Policies

This Plan uses local input, as well as best practices from cities across California, to establish goals, objectives, and policies for Live Oak as it moves to advance walking and bicycling. Specific goals and objectives are listed on the following pages.

Goal 1: Safety

Improve pedestrian and bicyclist safety through the design and maintenance of roadway improvements.

Objective 1.A: Reduce the number and severity of pedestrian and bicycle related collisions, injuries, and fatalities.

Policy 1.A.1: *Annually review the number, locations, and contributing factors of bicycle and pedestrian related collisions to identify and implement ongoing improvements at key locations throughout the transportation network.*

Policy 1.A.2: *Identify opportunities to reduce bicyclist and pedestrian exposure by reducing crossing distances or providing dedicated facilities that increase separation from motor vehicles.*

Goal 2: Mobility

Increase and improve bicycle and pedestrian access to community destinations across the City of Live Oak for all ages and abilities.

Objective 2.A: Plan, design, construct, and manage a Complete Streets network that accommodates the transportation needs of all mobility types, users, and ability levels.

Policy 2.A.1: *Integrate bicycle and pedestrian facilities as part of the design and construction of new roadways and, where there is available right-of-way, upgrades or resurfacing of existing roadways.*

Policy 2.A.2: *Provide safe, comfortable, and convenient bicycle and pedestrian access to existing and future transit facilities and stops.*

Objective 2.B: Work to eliminate barriers to bicycle and pedestrian travel.

Policy 2.B.1: *Prioritize projects that close gaps in the existing bicycle or pedestrian networks.*

Policy 2.B.2: *Identify opportunities to improve or add pedestrian and bicycle crossings of Live Oak Boulevard/Highway 99, Pennington Road, and the Union Pacific Railroad corridor.*

Policy 2.B.3: *Work with youth, elderly, and mobility-impaired community members to identify and address barriers to walking and bicycling.*

Policy 2.B.4: *Provide support facilities such as bicycle parking and wayfinding at appropriate locations, including employment centers, schools, and retail areas.*

Goal 3: Vibrancy

Develop a walking and bicycling environment that supports a vibrant community.

Objective 3.A: Create vibrant public spaces that encourage walking and bicycling in commercial and retail areas.

Policy 3.A.1: Prioritize bicycle and pedestrian improvements near commercial and retail nodes.

Policy 3.A.2: Support businesses that encourage and promote walking and bicycling.

Objective 3.B: Incorporate active transportation into promotion of tourism and economic development.

Policy 3.B.1: Partner with tourism and economic development agencies to promote Live Oak as a destination for active recreation and active lifestyles.

Policy 3.B.2: Collaborate with county and regional partners to create bikeway connections to the Sutter Buttes, Feather River, and other tourism generators, and to promote active recreation in the region.

Policy 3.B.3: Collaborate with county and regional partners to develop a walking and bicycling trail along the levee to Yuba City.

Goal 4: Programs

Increase awareness and value of walking and bicycling through encouragement, education, enforcement, and evaluation programs.

Objective 4.A: Identify and support educational opportunities for those who drive, bicycle, and walk about their rights and responsibilities, and to encourage walking and bicycling.

Policy 4.A.1: Support Live Oak Unified School District to implement a Safe Routes to School program.

Policy 4.A.2: Incorporate messaging in all City media that promotes the benefits of active lifestyles and raises awareness of walking and bicycling facilities in the community.

Objective 4.B: Identify and support enforcement to support improved safety.

Policy 4.B.1: Work with Sutter County Sheriff's Department to review collision locations and 'close-call' reports and identify locations for increased enforcement of motorist, bicyclist, and pedestrian behavior.

Policy 4.B.2: Coordinate with Sutter County Sheriff's Department and Live Oak School District to encourage good behavior at local schools by motorists, bicyclists, and pedestrians.

Objective 4.C: Identify and support evaluation programs that measure how well Live Oak is progressing to meet this Plan's goals.

Policy 4.C.1: Review the Bicycle, Pedestrian & Trails Plan recommendations at regular intervals to review progress and update priorities as necessary.

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5. Infrastructure Projects

The following chapter presents recommended bicycle and pedestrian infrastructure projects, along with citywide projects to support and promote walking and bicycling in Live Oak.

The recommendations in this chapter set the foundation for improving safety for those who currently walk or bicycle and to encourage more trips by walking or bicycling within Live Oak and connecting to regional destinations. This chapter includes:

- Citywide Projects
- Bikeway Projects
- Pedestrian Projects
- Spot Improvements
- Projects for Coordination with Other Agencies
- Future Studies

Citywide Projects

Economic Development Plan

An Economic Development Plan will identify strategies to grow the economy in Downtown Live Oak, with a focus on businesses that meet the needs of residents and visitors as well as creating a walkable and bikeable downtown.

The City prepares an annual Community and Economic Development Action Plan, which in 2015 included a downtown core reinvestment effort.

Recommendation

This Plan recommends the City continue to plan and implement improvements to reinvest in downtown, and expand these efforts to incorporate bicycle and pedestrian improvements.

Bicycle Wayfinding Program

A good bicycling environment not only includes bicycle facilities, but also includes an easily navigable network. Bicycle wayfinding assists bicyclist residents, tourists and visitors in finding key community destinations. Signs may also include "distance to" information, which displays mileage to community destinations.

Recommendation

This Plan recommends the development of a bicycle wayfinding program that offers guidance to destinations including schools, parks, the Live Oak Community Trail, downtown Live Oak, and civic buildings.

Wayfinding Signs

Bicycle Parking

Bicycle parking can range from a simple bicycle rack to storage in a bicycle locker or cage that protects against weather, vandalism and theft. Existing bicycle parking is provided on school campuses, at Memorial Park and the community pool, and at a handful of local businesses. Many of these existing facilities do not meet current bicycle rack standards.

Across the city, bicyclists visiting downtown, parks, schools and places of employment do not have available bicycle parking and instead may lock their bikes to street fixtures such as trees, telephone poles, and sign poles.

Bicycle parking is an essential element of any bikeway network and this section presents recommended types of bicycle parking and general requirements for bicycle parking.

Recommended Types of Bicycle Parking

Bicycle parking can be categorized into short-term and long-term parking. Bicycle racks are the preferred device for short-term bike parking. These racks serve people who leave their bicycles for relatively short periods of time, typically for shopping or errands, eating or recreation. Bicycle racks provide a high level of convenience and moderate level of security.

Long-term bike parking includes bike lockers and bike rooms and serve people who intend to leave their bicycles for longer periods of time and are typically found in multifamily residential buildings and commercial buildings. These facilities provide a higher level of security but are less convenient than bicycle racks.

Recommendation

This Plan recommends the City revise its existing bicycle parking code and require all new major development to provide bicycle parking consistent with Association of Pedestrian and Bicycle Professionals (APBP) guidelines.

Key revisions to existing code include:

Location: Require bicycle parking to be located near the main public entrance to the building or land use it is intended to serve, in a well-lit area.

Bicycle Facility Standards: This Plan also recommends the City and private developers only install bicycle parking that meets the following criteria. The racks shown below are the recommended standard rack types. Each of these racks provides parking for two bicycles.

Long-term bike parking should provide some weather protection and greater security than bicycle racks. Long-term parking should be a secure room or locker.

More information:
http://www.apbp.org/?page=publications

Types of Bicycle Racks

Bikeway Projects

The recommendations on following pages include a number of treatments which are described below in greater detail.

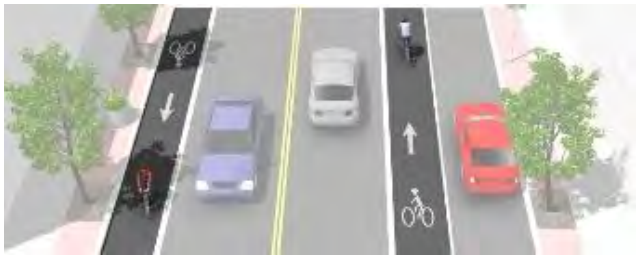
Class I Shared Use Paths

A Class I Bicycle or Shared Use Path provides for bicycle and pedestrian travel on a paved right-of-way completely separated from streets or highways. These recommended facilities can be popular for recreational bicycling as well as for commuting.

Class I Shared Use Paths

Class II Bike Lanes

Class II Bike lanes provide a signed, striped and stenciled lane on a roadway. Bicycle lanes are often recommended on roadways where traffic volumes or speeds are too high for comfortably sharing the travel lane.



Class II Bike Lanes

Class III Bike Routes

Class III Bike Routes provide for shared travel lane use and are generally only identified with signs. Bike Routes are appropriate on low volume, low speed streets. In some cases, they may be enhanced with shared lane markings or "sharrows" that alert motorists to the presence of bicyclists and indicate the desired lane position for bicyclists.

Class III Bike Routes

Class IV Protected Bikeways

Class IV protected bikeways are a new class of bicycle facility, and Caltrans is currently developing design guidance for communities. Generally, Class IV bikeways are on-street bicycle facilities that are separated from vehicle traffic by some kind of physical protection—including a curb, on-street parking, flexible bollards, or concrete planters. There are no Class IV Bikeways proposed in this Plan.

Class IV Protected Bikeways

Recommended bikeway projects are summarized by bikeway class in **Table 5-1**. The complete list of bikeway projects is provided in **Table 5-2**, and a map of the recommended improvements is shown in **Figure 5-1**.

Table 5-1: Summary of Bikeways by Class

Bikeway Class	Proposed Miles
Class I	5.64
Class II	3.35
Class III	1.17
TOTAL	**10.16**

Table 5-2: Recommended Bikeways

Type	Location	Start	End	Notes	Length (mi)
Class II	Allen St	N St	Linda St		0.11
Class II	Apricot St	Broadway	Samuel St	Existing curb extensions at trail crossing	0.49
Class I	California St	N St	Elm St	Live Oak Community Trail 2	0.18
Class III	Connecticut Ave	Jasmine Dr	Pennington Rd	With Shared Lane Marking	0.08
Class I	Existing Path	Date St	Deree Rd		0.05
Class III	Jasmine Dr	Connecticut Ave	Luther Rd	End at Luther school parking lot	0.31
Class III	Kola St	O St	Tulip St		0.24
Class III	L St	Pennington Rd	Archer Ave		0.28
Class II	Larkin Rd	Apricot St	Kristen St		0.34
Class I	Levee Rd	Sphere of Influence	Sphere of Influence	Collaborate w/regional partners to create regional trail system	4.05
Class II	Linda St	Allen St	South Terminus of Linda St	End at Live Oak Soccer Park	0.11
Class I	Live Oak Community Trail	Near Epperson Way	Kola St	Live Oak Community Trail 4	0.27
Class III	Luther Rd	Jasmine Dr	Pennington Rd		0.09
Class I	N St	Pennington Rd	California St	Live Oak Community Trail 2	0.03
Class II	N St	Elm St	Deanne St		0.77
Class II	P St	Date St	Apricot St		0.19
Class II	Pennington Rd	J St	Broadway		0.59
Class I	Pennington Rd	N St	O St	Live Oak Community Trail 2	0.06
Class II	Pennington Rd	Connecticut Ave	N Township Rd	With roadway improvement project, there is not enough pavement now	0.64
Class II	Pennington Rd	P St	Connecticut Ave	Move bike lane left of right-turn lane heading west on approach to Connecticut Ave	0.10
Class I	Pennington Rd	Levee Road	J Street	North Side	1.01
Class III	Tulip St	Kola St	Jasmine Dr		0.17

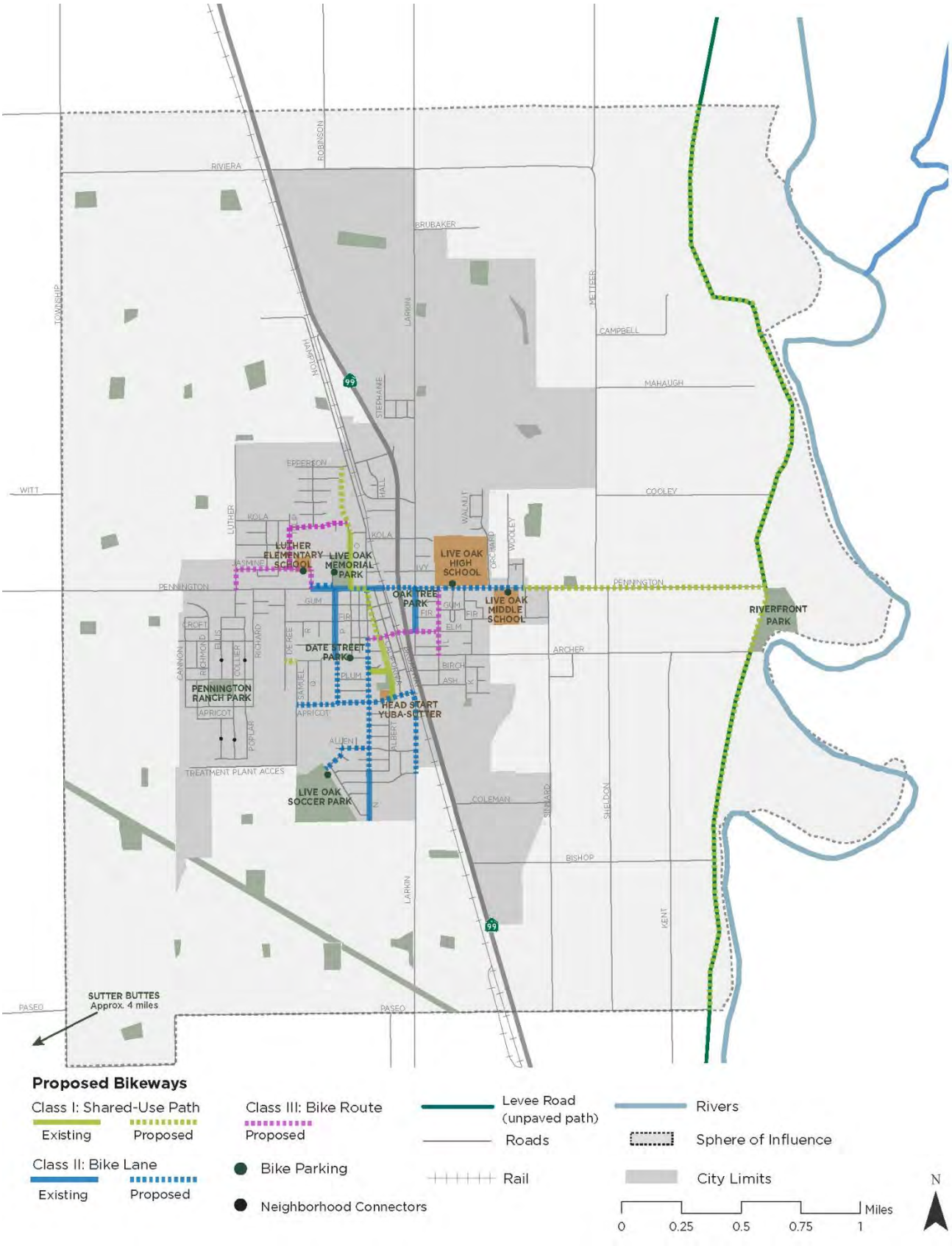


Figure 5-1: Recommended Bikeways

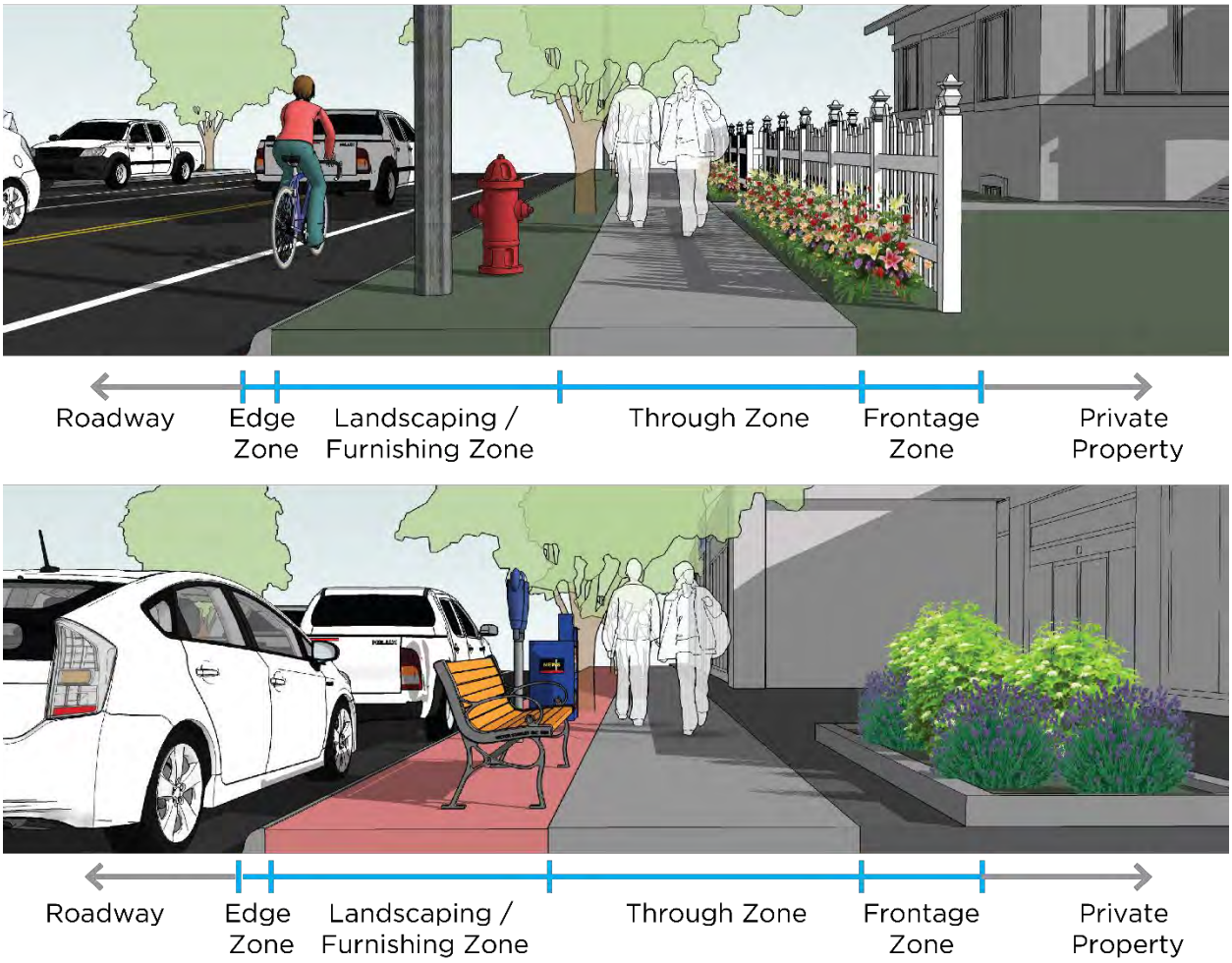
Pedestrian Projects

Sidewalks

Sidewalks form the backbone of the pedestrian transportation network. Good street and sidewalk design can foster healthier communities by improving public safety, enhancing mobility, reducing environmental impacts, and building community character.

Sidewalks consist of one or several zones. The zones are named for the primary activity that occurs in the zone. The frontage zone in retail and commercial areas may feature seating for cafés and restaurants, or extensions of other retail establishments, like florists shops. The furnishings zone may feature seating, as well as newspaper racks, water fountains, utility boxes, lampposts, street trees and other landscaping. The medium to high-density pedestrian zone should provide an interesting and inviting environment for walking as well as window shopping.

Recommended sidewalk improvements are shown in **Figure 5-2** and listed in **Table 5-3**.



Sidewalk Zones

Table 5-3: Recommended Sidewalks

Location	Start	End	Side	Notes	Length (ft)
Apricot St	116 ft W of P St	150 ft W of Q St	N		593
Archer St	469 ft E of K St	77 ft E of K St	N		392
Archer St	91 ft E of L St	L St	S		91
Archer St	K St	L St	N		682
Archer St	111 ft W of K St	187 ft W of K St	S		76
Archer St	407 ft E of K St	357 ft E of K St	S		50
Archer St	574 ft E of K St	497 ft E of K St	S		77
Ash St	L St	Hwy 99	N		373
Ash St	107 ft E of K St	L St	N		438
Ash St	117 ft E of K St	68 ft E of L St	S		387
Birch St	L St	Hwy 99	S		457
Birch St	L St	Hwy 99	N		466
Birch St	E end of Birch St	L St	N		438
Birch St	E end of Birch St	L St	S		446
Broadway	Elm St	Apricot St	E		1,291
Broadway	Pennington Rd	Elm St	E		964
Broadway	150 ft N of Center Way	Center Way	W		151
California St	Pennington Rd	Elm St	E		1,049
California St	N St	Fir St	W		451
Date St	70 ft W of P St	Q St	N		301
Date St	82 ft W of P St	Q St	S		217
Date St	L St	Larkin Rd	S		440
Date St	E end of Date St	L St	S		229
Date St	L St	Larkin Rd	N		472
Date St	E end of Date St	L St	N		226
Deree St	Pennington Rd	S end of Deree Ave	W		2,251
Deree St	Pennington Rd	S end of Deree Ave	E		2,195
Elm St	N St	O St	N		285
Elm St	N St	O St	S		288
Elm St	Larkin Rd	Hwy 99	S	Reconfigure parking (coordinate with property owner)	94
Elm St	P St	W end of Elm St	S		821
Elm St	P St	W end of Elm St	N		814
Elm St	80 ft E of Larkin Rd	Larkin Rd	S		80
Elm St	L St	107 ft W of L St	N		107
Elm St	252 ft E of L St	L St	N		253
Elm St	304 ft E of L St	L St	S		304
Elm St	257 ft W of K St	301 ft W of K St	N		44
Fir St	L St	154 ft E of Larkin Rd	N		309

Location	Start	End	Side	Notes	Length (ft)
Fir St	201 ft E of Larkin Rd	39 ft E of Larkin Rd	S		165
Fir St	California St	N St	N		114
Fir St	L St	49 ft W of L St	S		49
Fir St	191 ft E of Deree Ave	Deree Ave	N		191
Fir St	191 ft E of Deree Ave	Deree Ave	S		214
Gum St	L St	Larkin Rd	N		425
Gum St	L St	304 ft E of Larkin Rd	S		304
Gum St	N St	DeVilbiss Way	N		154
Gum St	DeVilbiss Way	O St	N		162
Gum St	DeVilbiss Way	O St	S		162
Gum St	N St	DeVilbiss Way	S		148
Gum St	452 ft W of P St	W end of Gum St	S		376
Gum St	P St	W end of Gum St	N		805
Gum St	P St	382 ft W of P St	S		382
Gum St	O St	P St	N	Reconfigure parking (coordinate with property owner)	272
Gum St	135 ft E of L St	L St	S		135
Gum St	O St	P St	S		298
Hwy 99	Riviera Rd	Paseo Ave	W	Caltrans Coordination; 6-ft sidewalk w/ variable landscaped buffer or bioswale. Reconfigure some parking (coordinate with property owners).	944
Ivy St	Larkin Rd	Hwy 99	S		291
Ivy St	Hwy 99	120ft W of Hwy 99	S		120
Ivy St	Hwy 99	Railroad	N		227
Ivy St	Larkin Rd	Hwy 99	N		281
Kola St	Larkin Rd	Hwy 99	S		291
Kola St	N St	O St	S		263
Kola St	N St	O St	N		310
Kola St	59 ft E of Hwy 99	Hwy 99	N		59
Kola St	Hwy 99	286 ft W of Hwy 99	N		286
Kola St	Hwy 99	Railroad	S	Reconfigure parking (coordinate with property owner)	466
L St	Gum St	Fir St	W		311
L St	Pennington Rd	Gum St	E		428
L St	Pennington Rd	Gum St	W		228
L St	Gum St	Elm St	E		444
L St	Archer	Birch St	W		297

Location	Start	End	Side	Notes	Length (ft)
L St	Date St	Archer Ave	W		146
L St	Pennington Rd	Date St	W		285
L St	Archer Ave	Birch St	E		298
L St	Date St	Archer Ave	E		152
L St	Elm St	Date St	E		286
L St	Blrch St	Ash St	W		282
L St	Fir St	Elm St	W		280
L St	Birch St	Ash St	E		285
Larkin Rd	275 ft N of Nevada St	72 ft N of Kola Ct	E		956
Larkin Rd	110 ft S of Jennifer Dr	Nevada St	W		1,714
Larkin Rd	Elm St	Archer Ave	W	Reconfigure parking (coordinate with property owner)	457
Larkin Rd	Allen St	760 ft S of Kristen St	W		1,212
Myrtle St	Hwy 99	Railroad	N		613
Myrtle St	Hwy 99	Railroad	S		616
N St	Pennington Rd	Gum St	W		1,002
N St	Gum St	Fir St	E		286
N St	Fir St	Elm St	W		1002
N St	Gum St	Fir St	W		1002
N St	98 ft N of Plum St	Apricot St	E		550
N St	Epperson Way	Kola St	W		1,489
Nevada St	Ramsdell Dr	Hwy 99	S		1,433
Nevada St	Hwy 99	Hall Dr	N	Reconfigure parking (coordinate with property owner)	274
Nevada St	Larkin Rd	Hwy 99	S	Reconfigure parking (coordinate with property owner)	296
Nevada St	Larkin Rd	Hwy 99	N		324
O St	Fir St	60 ft N of Date St	W		1,079
O St	152 ft N of Date St	104 ft N of Date St	E		146
O St	Gum St	Fir St	E	Reconfigure parking (coordinate with property owner)	691
O St	Kola St	280 ft S of Kola St	W		280
O St	200 ft S of Pennington Rd	Gum St	W		107
O St	Pennington Rd	Gum St	E		298
O St	Fir St	Elm St	E		691
O St	Gum St	Fir St	W		1,079
Orchard Way	551 ft N of Pennington Rd	800 ft N of Pennington Rd	E		248

Location	Start	End	Side	Notes	Length (ft)
Pennington Rd	Connecticut Ave	Deree Ave	S		508
Pennington Rd	Deree Ave	233 ft E of Richard Ave	S		381
Pennington Rd	Sinnard Ave	138 ft W of J St	S		643
Pennington Rd	Wooley Rd	Orchard Way	N		347
Q St	Date St	Apricot St	E		958
Q St	Date St	Apricot St	W		918
Q St	Fir St	S end of Q St	W		281
Q St	Fir St	S end of Q St	E		281
R St	Fir St	247 ft S of Fir St	E		247
R St	Fir St	S end of R St	W		290
Samuel St	Date St	465 ft S of Date St	W		466
Samuel St	50 ft N of Apricot St	32 ft S of Apricot St	W		83

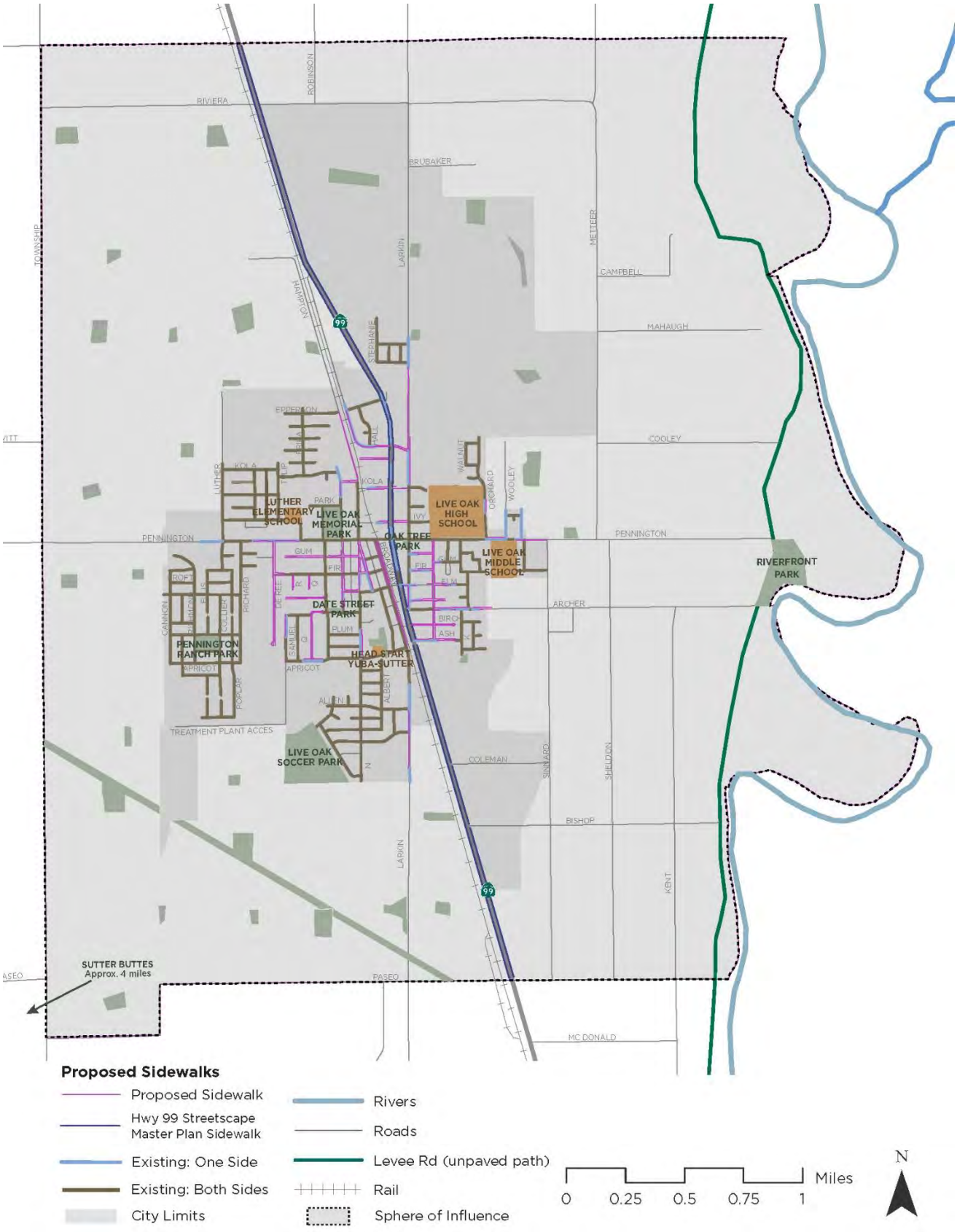


Figure 5-2: Recommended Sidewalks

Spot Improvements, Projects for Coordination with Other Agencies, and Studies

Recommended spot improvements, projects that will require coordination with Caltrans or Union Pacific Railroad, and projects for future study are shown on **Figure 5-3**.

Spot Improvements

Spot improvements include crosswalk markings and other location-specific improvements. These are designed to address specific locations where there are specific walking or biking challenges identified through the planning process. The recommended spot improvements are listed in **Table 5-4**.

Crosswalks

Crosswalk markings guide pedestrians across roadways by defining and delineating the path of travel. Crosswalk markings also alert motorists and bicyclists of a pedestrian crossing point across roadways not controlled by highway traffic signals or STOP signs.

There are several types of crosswalk markings, including standard (or transverse) markings and high visibility or "continental" markings. Crosswalks may be placed at intersections and at mid-block locations. Careful consideration must be made when considering crosswalk locations, including: traffic control, distance between controlled locations, average daily traffic, traffic speeds, and other factors.

Curb Extensions

Curb extensions can improve pedestrian safety by reducing crossing distances, in addition to calming traffic. Where they are recommended, curb extensions should be provided at both ends of the marked crosswalk, and should extend the full width of the parking aisle (generally 7 to 8 feet) but no further.

Rectangular Rapid Flashing Beacons

Rectangular rapid flashing beacons (RRFBs) are used to increase visibility of pedestrians at marked crosswalks where stop signs or traffic signals are not warranted. They include pedestrian crossing signs with bright rectangular lights that flash in an alternated pattern when a button is pressed. Many are solar powered, and can be installed without costly wiring work.

Projects for Coordination with Other Agencies

Live Oak is unique because it has both a state highway and a railroad within city limits. These corridors are important for local and regional mobility but also create a challenge for walking and bicycling. The projects described in **Table 5-5** are intended to address community identified needs.

These projects will require collaboration with Caltrans or Union Pacific Railroad.

Studies

A number of improvements intended to address walking and bicycling mobility will require further study. These projects are listed in **Table 5-6**.

Table 5-4: Spot Improvements

Location	Cross St	Improvement	Notes	Legs
Broadway	Elm St	Relocate sign	Relocate "Cross Traffic Does Not Stop" sign to existing Stop signpost; remove second post	
Broadway	Fir St	Crosswalk	Uncontrolled crossing - connection to linear park along RR, connection from parking to retail.	W, S
Broadway	Gum St	Crosswalk	Uncontrolled crossing - connection to linear park along RR, connection from parking to retail.	W, S
Hwy 99	Nevada St	Gateway monument		
Larkin Rd	Kristen St	Gateway monument		
O St	375 ft N of Pennington Rd	Curb ramp	Provide curb ramp at west end of new crosswalk	
O St	375 ft N of Pennington Rd	High visibility crosswalk	Midblock trail crossing to sports field	
Pennington Rd	Connecticut Ave	Yellow high visibility crosswalk	Stop controlled	E
Pennington Rd	90 ft W of J St	Curb extensions		W
Pennington Rd	280 ft E of J St	Speed feedback sign	Relocate existing speed feedback sign at J St to help reduce speeds in advance of the crossing	
Pennington Rd	K St	Remove crosswalk	Remove existing faded crosswalk	E
Pennington Rd	E of K St	Curb extensions	Midblock, east of eastern loading loop driveway	E
Pennington Rd	E of K St	RRFB	Midblock, east of eastern loading loop driveway	E
Pennington Rd	E of K St	Yellow high visibility crosswalk	Midblock, east of eastern loading loop driveway	
Pennington Rd	L St	Speed feedback sign	On eastbound approach	
Pennington Rd	L St	Curb extensions		W
Pennington Rd	L St	Yellow high visibility crosswalk	Existing faded transverse crossing	W
Pennington Rd	Levee Road	Bollards	Replace gates with bike-friendly bollards	
Pennington Rd	Maple Park	Yellow crosswalk		S
Pennington Rd	Orchard Way	Curb extensions		E
Pennington Rd	Orchard Way	Yellow high visibility crosswalk	Existing faded transverse crossing	E, N
Pennington Rd	Richard Ave	High visibility crosswalk	Stop controlled	S
Pennington Rd	315 ft E of Sinnard Rd	Gateway monument		
Pennington Rd	Wooley Rd	Yellow high visibility crosswalk	Student desire line from informal loading zone on N side of street.	E, N
Pennington Rd	205 ft E of Wooley Rd	Remove crosswalk	Remove crosswalk	

Table 5-5: Projects for Coordination with Other Agencies

Location	Cross St	Project	Notes
Connecticut Ave	Jasmine Dr	Gate	School District Coordination. Provide gate to access bicycle parking
Elm St	Railroad	Pedestrian Grade Crossing	UPRR and CPUC Coordination. Provide sidewalks across railroad ROW
Epperson Way/ Ramsdell Dr	Railroad	Study: Road Connection	UPRR and CPUC Coordination. Study new road connection across rail line, or bicycle/ pedestrian crossing
Hwy 99	Ash St	Study: Gateway and Traffic Calming	Caltrans Coordination
Hwy 99	Pennington Rd	Study: Lead Pedestrian Interval	Caltrans Coordination. Consider LPI during school arrival and dismissal Crash data shows pedestrians are hit while in crosswalks.
Kola St	Railroad	Pedestrian Grade Crossing	UPRR and CPUC Coordination. Provide sidewalks across railroad ROW
Larkin Rd	Railroad	Pedestrian Grade Crossing	UPRR and CPUC Coordination. Provide sidewalks across railroad ROW
Pennington Rd	Railroad	Pedestrian Grade Crossing	UPRR and CPUC Coordination. Provide sidewalks across railroad ROW

Table 5-6: Future Studies

Location	Cross St	Notes
Broadway	Apricot St	Stop warrant, with crosswalks on 3 legs
Broadway	Elm St	Improvements to address pedestrian crossing and vehicle queuing
California St	Gum St to N St fork	Close California St between Gum St and fork of N St; create neighborhood park
P St	Date St	Stop warrant with high visibility crosswalk
Pennington Rd	N St	Pedestrian hybrid beacon; trail crossing, with high visibility crosswalk
Pennington Rd	W City Limit to E City Limit	Study corridor for potential roundabout locations to address pedestrian crossings and vehicle queuing

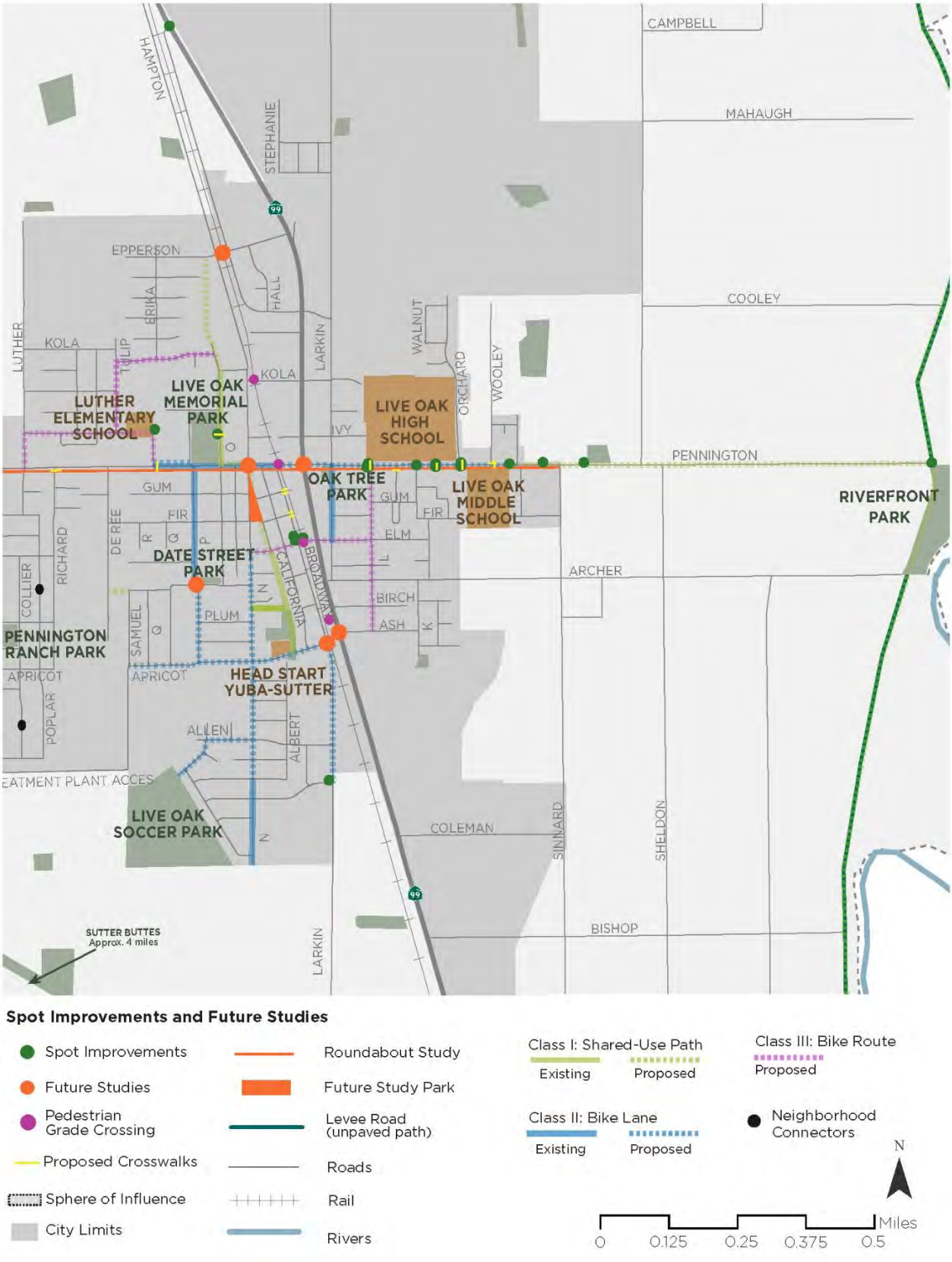


Figure 5-3: Spot Improvements, Projects for Coordination with Other Agencies, and Future Studies

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6. Recommended Programs

The following chapter presents recommended bicycle and pedestrian related program recommendations. The recommendations are organized in four E's:

- Education programs are designed to improve safety and awareness. They can include programs that teach students how to safely cross the street or teach drivers to expect pedestrians. They may also include brochures, posters, or other information that targets pedestrians or drivers.
- Encouragement programs provide incentives and support to help people leave their car at home and try walking instead.
- Enforcement programs enforce legal and respectful walking, bicycling, and driving. They include a variety of tactics, ranging from police enforcement to neighborhood signage campaigns.
- Evaluation programs are an important component of any investment. They help measure success at meeting the goals of this Plan and to identify adjustments that may be necessary.

Education

Education programs are important for teaching safety rules and laws as well as increasing awareness regarding walking and bicycling opportunities and existing facilities. Education programs may need to be designed to reach groups at varying levels of knowledge and there may be many different audiences: pre-school age children, elementary school students, teenage and college students, workers and commuters, families, retirees, the elderly, new immigrants and non-English speakers.

Student Bicycle and Pedestrian Traffic Safety Education

Student education programs are an essential component of bicycle and pedestrian education. Students are taught traffic safety skills, basic traffic laws, and safety rules.

Example pedestrian education curriculum elements include traffic sign identification and how to use a crosswalk. Bicycle education curriculum typically includes two parts: knowledge and skills. Knowledge lessons are typically in-class, while skills are practiced on a bicycle. Lessons can include helmet and bicycle fit, hand signals, and riding safely with traffic.

Benefits

Student bicycle and pedestrian traffic safety education can benefit the Live Oak community by:

- Improving safety by teaching children about lifelong safety skills
- Create awareness with students and parents
- Encourage families to consider walking or bicycling to school on a more frequent basis

Recommendation

This Plan recommends the City coordinate with the School District to implement pedestrian and bicycle safety education for students.

Rail Safety Education

Live Oak has a rail line through the City and residents could benefit from education on rail safety. Rail safety education and messaging can address these challenges.

The City currently administers an annual Rail Safety poster contest, with the winning poster displayed on a billboard near the community. Further rail safety education could build on this contest, and outreach materials could incorporate artwork from contest submissions.

The Federal Railroad Administration has partnered with Operation Lifesaver on a national program designed to end collisions, deaths and injuries related to rail crossings. Information can be found at: http://oli.org/

Recommendation

This Plan recommends the City seek funding to develop and implement rail safety education, building on the current rail safety poster contest.

Operation Lifesaver offers education tools

Encouragement

Everyone from young children to elderly residents can be encouraged to increase their rates of walking and bicycling or to try walking or bicycling instead of driving for short trips.

Back-to-School Encouragement Marketing

Families set transportation habits during the first few weeks of the school year and are often not aware of transportation options and routes available to them. Because of this, many families develop the habit of driving to school using the same congested route as everyone else.

A back-to-school encouragement marketing can promote bus, carpool, walking and bicycling to school. The marketing campaign can include suggested route maps, safety education materials, volunteer opportunities, event calendars, and traffic safety enforcement notices. It can also include an illustrative guide with Suggested Walking and Biking to School maps.

Recommendation

This Plan recommends the City coordinate with the School District to encourage walking and bicycling to school as part of back-to-school activities each year.

Walk to School Day

International Walk to School Day is typically held in early October. Students and families are encouraged to walk to school. The event celebrates the many students who already walk to school, and encourages additional families to try walking to school.

Schools can leverage the enthusiasm by holding other contests and events during the week or on the day of the event.

Participation in Walk to School Day can benefit Live Oak residents by building community, saving families money on gas, and reducing traffic congestion around schools.

Recommendation

This Plan recommends the district work with schools to participate in Walk to School Day.

Bike to School Day

Bike to School Day is typically held in mid-May. Students and families are encouraged to bike to school. Similar to Walk to School Day events, this program celebrates students who already bike to school and encourages additional families to try bicycling to school.

Schools can leverage the enthusiasm by holding other contests and events during the week or on the day of the event.

Participation in Bike to School Day can benefit Live Oak residents by building community, saving families money on gas, and reducing traffic congestion near schools.

Recommendation

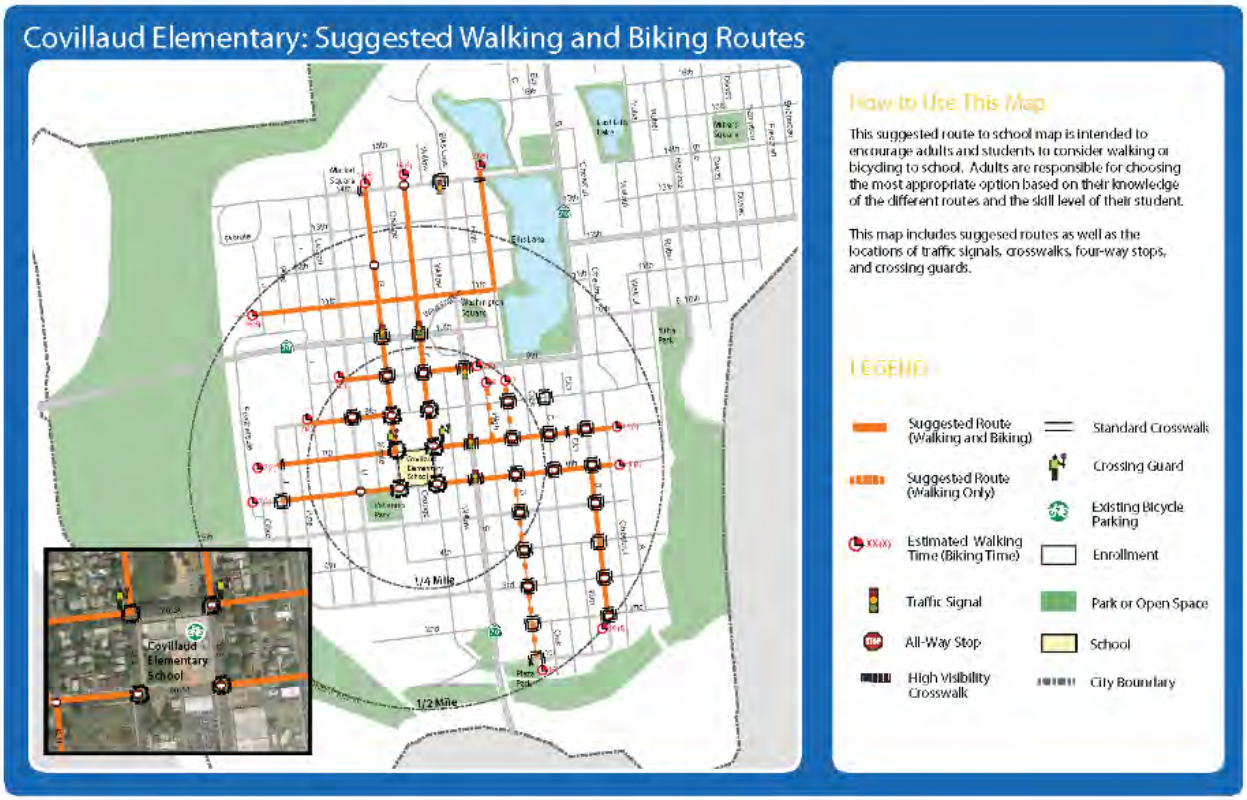
This Plan recommends the district work with schools to participate in Bike to School Day

Suggested Walking and Biking Routes to School Maps

Suggested Walking and Biking Routes to School Maps can help parents overcome fears related to traffic and/or lack of knowledge of family friendly routes to school. These types of maps show stop signs, traffic signals, crosswalks, paths, overcrossings, crossing guard locations and similar elements that can help parents make decisions about choosing the route that best fits their family's walking or biking needs.

Recommendations

This Plan recommends the City develop Suggested Routes to School maps for Luther Elementary School, Live Oak Middle School, and Live Oak High School. This Plan also recommends these maps be reviewed and updated every four years to reflect improvements as they are implemented in the community.



Suggested Route to School Map from the City of Marysville

Enforcement Programs

Enforcement programs enforce legal and respectful use of the transportation network. These programs will help educate motorists, bicyclists, and pedestrians about the rules and responsibilities of the road.

Crosswalk Stings/Enforcement Campaigns

In a crosswalk sting operation, the Police Department targets drivers who fail to yield to pedestrians in a school crosswalk. A plain-clothes decoy police officer ventures into a crosswalk and motorists who do not yield are given a citation by a second officer stationed nearby.

The Police Department or School District may alert the media to the crosswalk stings to increase public awareness of the crosswalk safety issue. Other common enforcement campaigns include targeting driver violations including speeding or talking/texting on cellphones.

Recommendation

This Report recommends the City and School District work with the Sutter County Sheriff's Department to conduct crosswalk stings and enforcement campaigns along Highway 99 and near schools and other key destinations for bicyclists and pedestrians.

Evaluation Programs

Evaluation programs help the City measure how well it is meeting the goals of this Plan and the General Plan, and evaluation is a key component of any engineering or programmatic investment. It is also a useful way to communicate success with elected officials as well as local residents.

Annual Collision Data Review

Reviewing bicycle and pedestrian related collisions and near-misses on an annual basis can help the City identify challenging intersections or corridors. This review should include an assessment of the existing infrastructure to determine whether improvements can be made to reduce the number of collisions in the community.

Recommendation

This Plan recommends the City and Sheriff's Department review bicycle and pedestrian related collision data on an annual basis to identify needed improvements.

Student Walking and Biking Counts

Student hand tallies are one way to count the number of students who walk, bicycle, take transit or carpool to school. The National Center for Safe Routes to School provides the standard tally form.

Recommendation

This Plan recommends the Live Oak Unified School District conduct student tallies on an annual basis.

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7. Implementation

This chapter presents a prioritized list of the individual infrastructure improvements, including the evaluation criteria and scoring method used followed by a discussion of maintenance.

Projects were evaluated based on the criteria described in **Table 7-1**, and then organized into short-, mid-, and long-term tiers based on natural breaks in the scores and complexities of implementation. Score ranges in each tier are:

- **Tier 1** projects (100-55 points) are priority projects intended for short-term implementation
- **Tier 2** projects (54-40 points) are intended for mid-term implementation
- **Tier 3** projects (39 or fewer points) are intended for long-term implementation

The result is a prioritized list of projects to be implemented. As projects are implemented over time, lower ranked projects move up the list.

Table 7-1: Project Evaluation Criteria

Criteria	Description	Max Score
Potential Users	The project is on a corridor where higher pedestrian and bicycle demand is anticipated, including the Live Oak Community Trail, Pennington Road, N Street, L Street, Larkin Road, or Elm Street. *Score or No Score*	25
Connectivity	The project provides a direct connection across Highway 99 or the Union Pacific Railroad, or provides a direct connection to a school or park. *Score or No Score*	25
Economic Development	The project connects to a retail district or other economic activity generator. *Score or No Score*	20
Safety	The project addresses a location with a history of bicycle- and pedestrian-involved collisions. *Score or No Score*	15
Project Readiness	The project could feasibly be implemented within a five year timeframe, taking into consideration the difficulty of acquiring additional right-of-way and construction costs. *Score or No Score*	15
	Total Possible Score	**100**

The project list and individual projects included in this Plan are flexible concepts that serve as a guideline. The high-priority project list may change over time as a result of changing walking and bicycling patterns, land use patterns, implementation constraints and opportunities, and the development of other transportation improvements. As projects are implemented, the City of Live Oak should report progress to the community and Council on an annual basis.

Recommended programs received a qualitative evaluation regarding how well they meet this Plan's vision and goals.

Cost Estimate Assumptions

Table 7-2 presents the planning level cost assumptions used to determine project cost estimates. Unit costs are typical or average costs informed by Alta Planning + Design's experience working with California communities. While they reflect typical costs, unit costs do not consider project specific factors such as intensive grading, landscaping, or other location-specific factors that may increase actual costs. For some segments, project costs may be significantly greater.

Table 7-2: Unit Cost Assumptions

Item	Unit	Cost Assumption
Bollards	EA	$800
Class I Shared-Use Path	MI	$590,000
Class II Bike Lanes	MI	$44,000
Class III Bicycle Route	MI	$9,000
Class III Bicycle Route with Shared Lane Markings	MI	$16,000
Crosswalk – Standard Transverse	EA	$1,500
Crosswalk – High Visibility	EA	$2,800
Crosswalk Removal	EA	$1,200
Curb Extension	EA	$30,000
Curb Ramp	EA	$4,000
Gateway Monument	EA	$8,000
Rectangular Rapid-Flashing Beacon (Two Units)	EA	$25,000
Sidewalk, Curb, Gutter	LF	$170
Sign	EA	$300
Sign Relocation with Pole Removal	EA	$1,200
Speed Feedback Sign	EA	$16,000
Studies	EA	Varies

Priority Project Summary

Table 7-3 presents a cost summary by tier and project type. A list of Tier 1 projects is provided in **Table 7-4**. For a complete list of all recommended projects, see **Appendix C**.

Table 7-3: Estimated Cost Summary by Tier and Project Type

Project	Estimated Cost
Tier 1	
Bikeways	$186,400
Class I Shared Use Paths	$153,600
Class II Bike Lanes	$30,300
Class III Bike Routes	$2,500
Sidewalks	$7,892,600
Highway 99 Streetscape Master Plan	$6,412,200
Local Streets	$1,305,400
Widen Sidewalk	$175,000
Spot Improvements	$207,300
Bollards	$800
Crosswalks	$6,000
Crosswalks – Yellow	$1,500
Crosswalks – Yellow High Visibility	$16,800
Crosswalks Removal	$2,400
Curb Extensions	$120,000
Rectangular Rapid Flashing Beacons	$27,800
Speed Feedback Signs	$32,000
Studies	$230,000
Complete Streets	$100,000
Crossings	$20,000
Intersection Improvements	$10,000
Street Closures	$20,000
Traffic Calming	$80,000
UPRR Coordination: Pedestrian Crossings	$40,000
Total for Tier 1	**$8,556,300**
Tier 2	
Bikeways	$244,600
Class I Shared Use Paths	$159,900
Class II Bike Lanes	$81,900
Class III Bike Routes	$2,800
Sidewalk: Local Streets	$2,291,400
Spot Improvements	$41,600
Access Gates	$4,000

Project	Estimated Cost
Crosswalks – High Visibility	$5,600
Curb Ramps	$6,800
Gateway Monuments	$24,000
Sign Relocation	$1,200
Studies	$40,000
Control Warrants	$20,000
Intersection Improvements	$20,000
UPRR Coordination: Pedestrian Crossing	$20,000
Total for Tier 2	**$2,637,600**
Tier 3	
Bikeways	$3,053,900
Class I Shared Use Paths	$3,013,000
Class II Bike Lanes	$35,100
Class III Bike Routes	$5,800
Sidewalk: Local Streets	$5,332,200
Study: Crossings	$40,000
UPRR Coordination: Pedestrian Crossings	$20,000
Total for Tier 3	**$8,446,100**
Total for all projects	**$19,640,000**

Table 7-4: Tier 1 Priority Projects

Project	Location	Start	End	Side	Notes	Total Score	Cost	Length (ft or mi)
Widen Sidewalk	Broadway	67 ft S of Pennington Rd	Elm St	W	Widen Sidewalk	75	$175,000	916 ft
Sidewalk	Broadway	Elm St	Apricot St	E		60	$219,400	1,291 ft
Crosswalk	Broadway	Fir St		N, S	Uncontrolled crossing - connection to linear park along RR, connection from parking to retail.	60	$3,000	
Crosswalk	Broadway	Gum St		N, S	Uncontrolled crossing - connection to linear park along RR, connection from parking to retail.	60	$3,000	
Sidewalk	Broadway	Pennington Rd	Elm St	E		60	$164,000	964 ft
Study: Street Closure	California St	Gum St	N St fork			60	$20,000	0.18 mi
Class I Shared Use Path	California St	N St	Elm St		Live Oak Community Trail 2	60	$103,900	0.18 mi
Sidewalk	Elm St	Larkin Rd	Hwy 99	S	Reconfigure parking (coordinate with property owner)	60	$16,000	94 ft
Sidewalk	Elm St	N St	O St	N		65	$48,500	285 ft
Sidewalk	Elm St	N St	O St	S		65	$48,900	288 ft
Pedestrian Crossing	Elm St	Railroad			UPRR and CPUC Coordination	85	$20,000	
Hwy 99 Streetscape Master Plan Sidewalk	Hwy 99	Riviera Rd	Paseo Ave	E, W	Caltrans Coordination; 6 foot sidewalk w/ variable landscaped buffer or bioswale. Reconfigure some parking (coordinate with property owners).	85	$6,412,200	37,719 ft
Study: Traffic Calming	Hwy 99	Ash St			Gateway and Traffic Calming	65	$80,000	
Class III Bike Route	L St	Pennington Rd	Archer Ave			55	$2,500	0.28 mi
Sidewalk	Larkin Rd	275 ft N of Nevada St	72 ft N of Kola Ct	E		65	$162,500	956 ft

Project	Location	Start	End	Side	Notes	Total Score	Cost	Length (ft or mi)
Sidewalk	N St	Fir St	Elm St	W		65	$170,400	1,002 ft
Sidewalk	N St	Gum St	Fir St	E		65	$48,600	286 ft
Sidewalk	N St	Gum St	Fir St	W		65	$170,400	1,002 ft
Class I Shared Use Path	N St	Pennington Rd	California St		Live Oak Community Trail 2	65	$15,500	0.03 mi
Sidewalk	N St	Pennington Rd	Gum St	W		65	$170,400	1,002 ft
Remove Crosswalk	Pennington Rd	205 ft E of Wooley Rd			Existing faded transverse crossing; remove crosswalk	65	$1,200	
Speed Feedback Sign	Pennington Rd	280 ft E of J St		S	Existing Speed Feeback Sign at crosswalk, move here to slow drivers down before school crosswalk	65	$16,000	
Curb Extensions	Pennington Rd	90 ft W of J St		W	Curb extensions	65	$30,000	
Sidewalk	Pennington Rd	Connecticut Ave	Deree Ave	S		70	$86,300	508 ft
Yellow High Visibility Crosswalk	Pennington Rd	Connecticut Ave		E	Stop controlled crossing	55	$2,800	
Study: Intersection Improvement	Pennington Rd	Hwy 99			Lead pedestrian interval; during school arrival and dismissal. Crash data shows pedestrians are hit while in crosswalks	100	$10,000	
Class II Bike Lanes	Pennington Rd	J St	Broadway			65	$26,000	0.59 mi
Curb Extensions	Pennington Rd	E of K St			Midblock, east of eastern loading loop driveway	65	$30,000	
Yellow High Visibility Crosswalk	Pennington Rd	E of K St			Midblock, east of eastern loading loop driveway	65	$2,800	
RRFB	Pennington Rd	E of K St			Midblock, east of eastern loading loop driveway	65	$27,800	
Remove Crosswalk	Pennington Rd	K St		E	Existing faded transverse crossing; remove crosswalk	65	$1,200	
Curb Extensions	Pennington Rd	L St		N	Curb extensions	65	$30,000	

Project	Location	Start	End	Side	Notes	Total Score	Cost	Length (ft or mi)
Speed Feedback Sign	Pennington Rd	L St		W	Speed feedback sign	65	$16,000	
Yellow High Visibility Crosswalk	Pennington Rd	L St		W	Existing faded transverse crossing	65	$2,800	
Bollards	Pennington Rd	Levee Rd		N	Replace gate with bicycle-friendly bollards	65	$800	
Yellow Crosswalk	Pennington Rd	Maple Park		S		65	$1,500	
Class I Shared Use Path	Pennington Rd	N St	O St		Live Oak Community Trail 2	85	$34,200	0.06 mi
Study: Crossing	Pennington Rd	N St			Pedestrian hybrid beacon; trail crossing, need controls, with high visibility crosswalk	80	$20,000	
Curb Extensions	Pennington Rd	Orchard Way		E	Curb extensions	65	$30,000	
Class II Bike Lanes	Pennington Rd	P St	Connecticut Ave		Move bike lane left of right-turn lane heading west on approach to Connecticut Ave	65	$4,300	0.10 mi
Pedestrian Crossing	Pennington Rd	Railroad			UPRR and CPUC Coordination	85	$20,000	
Study: Complete Streets	Pennington Rd	W City Limit	E City Limit		Study corridor for potential roundabout locations to address pedestrian crossings and vehicle queuing	100	$100,000	1.55 mi

Maintenance

Maintaining the walking and bicycling environment once it has been implemented preserves the investment and helps support a high quality of life for Live Oak residents. Maintenance is recommended to include sweeping, restriping, occasional sign replacement, and litter removal as appropriate for each bikeway class. Estimated maintenance frequency and costs are described below in **Table 7-5**.

Table 7-5: Estimated Maintenance Frequencies and Costs

Facility	Recommended Frequency	Typical Cost Per
Class I Shared-Use Paths	Annual	$10,000
Class II Bike Lanes	Annual	$2,000
Class III Bike Routes	Annual	$1,200
Class III Bike Boulevards	Annual	$1,200
Crosswalk restriping	10-year Cycle	$2,800
Sidewalk and curb ramp repair	As needed	TBD
Sign repair	As needed	$300
Tree trimming	Annual	TBD

Future Trip Estimates

Build-out of the recommendations in this Plan will result in increased walking and bicycling activity compared to estimated current activity. Because there are many variables involved, future trips are estimated for a range of mode shares that may be achieved after implementation of the recommendations in this Plan.

Current bicycling trips are estimated at 9,000 trips annually, for a mode share of less than 0.1 percent. Following implementation of the recommendations in this Plan, bicycling trips are estimated to increase to between 43,000 and 106,000 trips annually, for a mode share between 0.50 and 1.25 percent.

Current walking trips are estimated at 220,000 trips annually, for a mode share of approximately 1.04 percent. Following implementation of the recommendations in this Plan, walking trips are estimated to increase to between 318,000 and 637,000 trips annually, for a mode share between 1.5 and 3.0 percent.

The projected increase in walking and bicycling trips will help Live Oak to maintain its air quality by reducing the number of vehicle miles traveled and in turn, reducing vehicle emissions.

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Appendix A. Plan and Policy Review

Local & Regional Plans and Policies

City of Live Oak 2030 General Plan (2011)

The Live Oak General Plan lays out a vision for a community where small-town character and charming neighborhoods attract residents, with neighborhood shops that emphasize walkability and streets that function as public spaces that are pleasant for people walking, bicycling, taking transit, driving, and transporting goods.

The General Plan also lists Key Issues identified by community members for each element of the plan. Issues related to walking and bicycling include:

- Live Oak is bisected by State Route (SR) 99 and the Union Pacific Railroad, making east-west-travel difficult.
- The lack of frequent railroad crossings and traffic along SR 99 cause congestion on local streets in the downtown area.
- Traffic congestion occurs around the City's schools when parents drop off and pick up schoolchildren.
- Older parts of the city have a traditional street grid pattern, which provides many connections and good access throughout neighborhoods. Newer parts of the city depart somewhat from the grid pattern, using street networks that provide relatively fewer access points and fewer direct connections between neighborhoods.
- Bicycle facilities are poorly marked or are lacking in much of the City.
- The older sections of town generally lack sidewalks.
- Many parts of the city lack safe and convenient pedestrian, bicycle, and vehicle access across the highway and railroad.
- Public transportation in Live Oak is currently limited to a single bus route operated by Yuba-Sutter Transit that makes three round trips to Yuba City and Marysville each week. There are only three transit stops in Live Oak.

Key goals, policies, and implementation programs relevant to the Live Oak Bicycle, Pedestrian & Trails Master Plan include:

Land Use Element

- Goal LU-4: Revitalize downtown with a variety of options for residents and visitors to gather, shop, eat, work, live, obtain commercial and public services, and recreate.
    - Policy LU-4.1: The City will encourage mixed-use development in the downtown core area, with design elements intended to provide a comfortable and safe pedestrian environment.
    - Policy LU-4.6: The City will encourage affordable housing development around the downtown core area and in Centers, where people without a car can access services.

Circulation Element

The Circulation Element includes the following street standards for new streets, shown in **Table A-1**.

Table A-1 : Live Oak General Plan Street Standards

Functional Class	Driveway Access	Sidewalk Width	Planted Median	Bike Lane	Street Trees	Desired Speed (mph)	On-Street Parking	Preferred Lane Width	# of Travel Lanes
Arterial	Limited	4-7’	Optional	Yes	Yes	30-45	No	11-12’	2-4
Major Collector	Limited	4-10’	Optional	Yes	Yes	25-35	Optional	11’	2-4
Minor Collector	Yes	4-10’	No	Yes	Yes	≤30	Yes	10-11’	2
Local	Yes	4-6’	Optional	No	Yes	≤25	Yes	10-11’	2

- Goal CIRC-1: Develop a highly connected circulation system.
  - Policy CIRC-1.1: New development shall provide highly connected street and pedestrian/bicycle networks, with many connections between neighborhoods, between new neighborhoods and older neighborhoods, and between Neighborhood and Civic Centers and the surrounding neighborhood.
  - Policy CIRC-1.2: Block length should be limited in new residential and mixed-use development areas to accommodate pedestrians and bicyclists, with smaller block lengths in and around Neighborhood and Civic Centers. (See **Figure A-1** for a map of future commercial centers.)
  - Policy CIRC-1.3: Where cul-de-sacs are allowed, they must allow emergency and bicycle/pedestrian through access, where appropriate.
- Policy CIRC-1.5: No property subdivision may have more than 25 percent of the total public street length in cul-de-sacs unless an exception is granted by the Community Development Director based on findings related to such issues as the small size of the subdivision, the infill location, or the location of the subdivision next to the railroad or Highway 99.
- Policy CIRC-1.6: New development shall contribute on a fair-share basis toward construction of an overcrossing of the railroad and SR 99.
- Policy CIRC-1.7: The following local streets shall be extended into proposed developments, as appropriate: Samuel Street to the south, Wooley Road to the north, and Jasmine Drive and Heather Drive to the west.

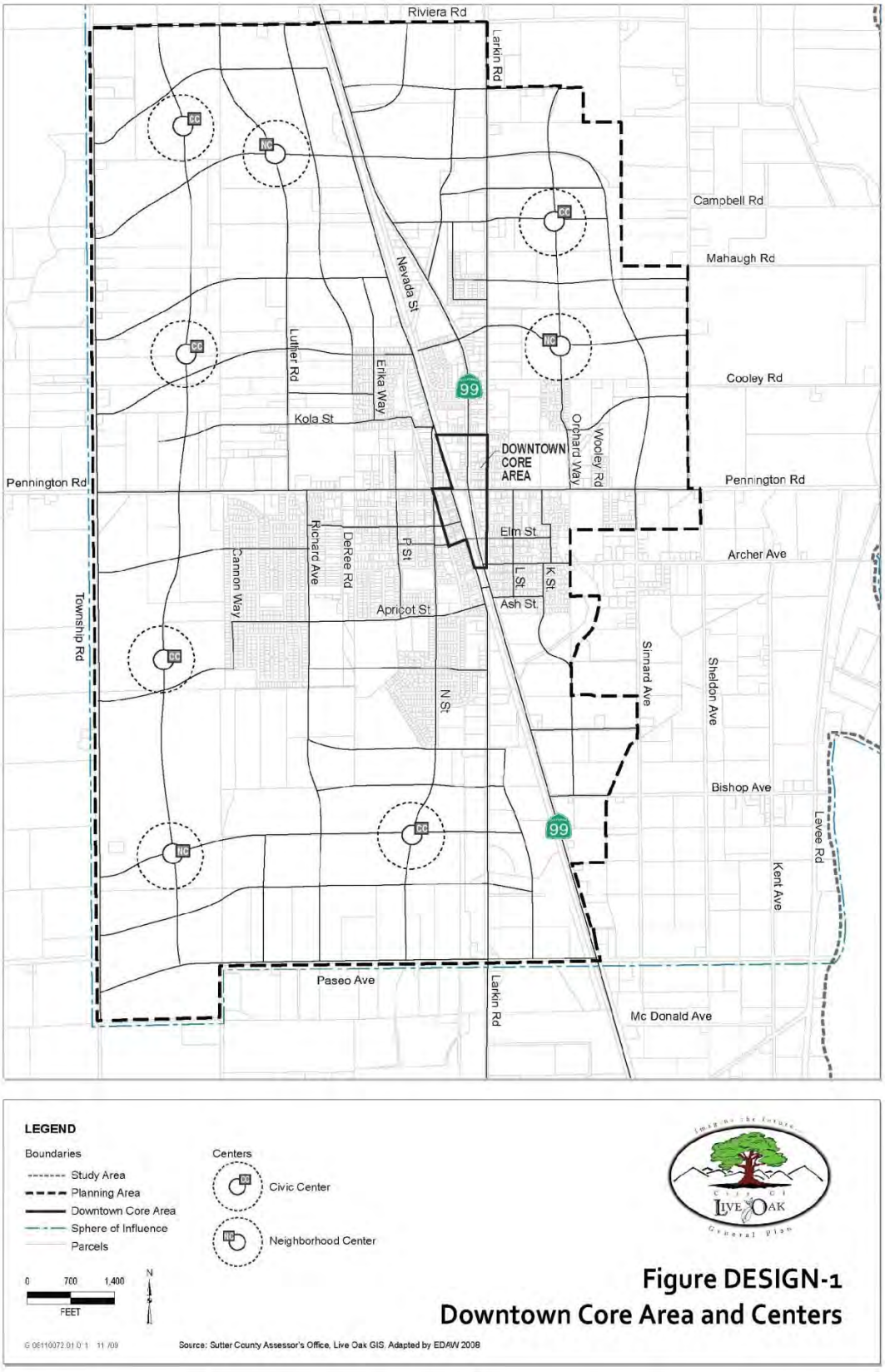

Figure A-1: Live Oak General Plan – Downtown Core Area and Centers

- Goal CIRC-2: Improve the convenience and safety for multi-modal travel in existing development.
  - Policy CIRC-2.1: The City will seek funding for, and include pedestrian and bicycle improvements in Capital Improvements Planning, as feasible. Such improvements will include, but are not limited to:
    - Construction of sidewalks where they do not currently exist,
    - Widening of sidewalks in high pedestrian traffic areas,
    - Installation of bike paths and lanes, and
    - Improved crossings of roads and the railroad for bicycles and pedestrians.
  - Policy CIRC-2.2: The City and Redevelopment Agency will prioritize transportation investments that better connect neighborhoods to major destinations, with safer and more convenient pedestrian, bicycle, and transit stops and routes.
  - Policy CIRC-2.3: The City will seek funding and consult with property owners to increase connectivity in existing neighborhoods by constructing new roads and/or bicycle/pedestrian paths at the end of dead-end streets and cul-de-sacs in the existing developed areas.
  - Policy CIRC-2.4: The City will seek funding for and, as feasible, install traffic-calming measures, such as planted medians, landscaped planter strips, landscaped traffic circles, and other designs in areas with excessive traffic, as appropriate.
  - Policy CIRC-2.5: The City and Redevelopment Agency will explore opportunities to construct new, or improve the safety of existing east-west crossings, or may require such improvements as a condition of new development, as appropriate.
  - Policy CIRC-2.6: The City will consider its own operations and maximize opportunities to use, and encourage employees' use of pedestrian, bicycle, and transit facilities.
- Goal CIRC-3: Ensure safe and convenient daily travel for pedestrians, bicyclists, transit users, and drivers as Live Oak grows.
  - Policy CIRC-3.1: New development shall construct and dedicate streets that accommodate the full range of locally available travel modes.
  - Policy CIRC-3.2: New development shall construct and dedicate and/or contribute to a connected bicycle/pedestrian network that is designed to promote travel to all schools, parks, and other major destinations.
  - Policy CIRC-3.3: New development shall contribute on a fair-share basis to construct streets and bicycle/pedestrian paths in new growth areas that serve area-wide or citywide travel needs.
  - Policy CIRC-3.4: New development shall contribute on a fair-share basis to improve streets in existing developed areas affected by new development traffic.
  - Policy CIRC-3.5: In areas with high pedestrian activity, streets should be relatively narrow and curb radii should be designed to promote pedestrian safety and convenience, while also ensuring adequate emergency access.
  - Policy CIRC-3.6: Bicycle parking should be provided as a part of all non-residential development.

- Goal CIRC-4: Provide parking in a way that balances the needs of motorists, pedestrians, bicyclists, transit users, and community aesthetics.
    - Policy CIRC-4.5: Shade trees shall be provided in any proposed surface parking to achieve a minimum of 50 percent canopy coverage at maturity. A ratio of at least one tree for every six parking spaces is recommended, although 50 percent canopy coverage will require more of some tree species and fewer of other species.
- Goal CIRC-5: Allow for efficient delivery of materials and shipment of products for Live Oak businesses without adversely affecting residents.
    - Policy CIRC-5.1: The City will work cooperatively with the California Department of Transportation (Caltrans), the Sacramento Area Council of Governments (SACOG), and property owners to plan and fund improved access to and from SR 99 for existing and future businesses, including:
        - Examine alternatives for improvements to Highway 99 (capacity and bicycle/pedestrian safety improvements) and identify preferred conceptual plans to provide certainty for existing and future property owners along Highway 99;
        - Enhance and add cross-town circulation connections that make crossings of SR 99 and the railroad easier and more convenient for Live Oak residents and commerce; and,
        - Work cooperatively with Caltrans, SACOG, and Sutter County to examine opportunities for a bypass around Live Oak in the Paseo Road/Township Road corridor.
- Goal CIRC-6: Provide convenient public transit service for Live Oak residents and businesses.
    - Policy CIRC-6.1: The City will consult with Yuba-Sutter Transit to maximize the availability of public transit options for Live Oak residents. This will include the development of local transit routes that provide frequent regular service to all areas of the city and transit connections to nearby communities of Gridley, Yuba City, and Marysville.
    - Policy CIRC-6.2: The City will consult with Yuba-Sutter Transit to develop convenient commuter routes from Live Oak to major employment areas, such as Yuba City, Marysville, and Sacramento, and provide transit commuter routes serving Live Oak Employment areas, as it becomes feasible.
    - Policy CIRC-6.3: The City will consult with Butte Regional Transit to develop a transit route that can stop in Live Oak on a regular basis and provide a connection to Butte County communities and employment centers.
    - Policy CIRC-6.4: New development shall provide transit stops and bus pull-out lanes, consistent with City direction, long-range transit plans, and policies of local transit providers.
    - Policy CIRC-6.5: Transit stops will be focused in Neighborhood Centers, Civic Centers, near schools, employment centers, retail establishments, parks, retirement communities, and in the downtown core area.
    - Policy CIRC-6.6: Existing and future transit stops should have benches, covered sitting areas, and other amenities that make public transit more comfortable and attractive as a travel choice.

- Policy CIRC-6.9: The City will provide incentives to local businesses that sponsor transit routes or create their own travel demand management programs. Incentives may include, but are not limited to, streamlined permitting, and reduction of parking requirements.

- Goal CIRC-7. Redesign SR 99 within Live Oak to better meet local needs.
  - Policy CIRC-7. 1: The City will consult with Caltrans, SACOG, and other relevant agencies to plan, fund, and implement context-sensitive design solutions along SR 99 that calm traffic, enhance aesthetics, and improve pedestrian safety and convenience, consistent with this General Plan.
  - Policy CIRC-7.2: The City will encourage and support narrower lanes for SR 99 between Kola Street and Archer Avenue, as one way to increase safety and encourage slower traffic.
  - Policy CIRC-7.3: As development occurs along SR 99, this should include construction of separated sidewalks with street trees along property frontages.
  - Policy CIRC-7.4: The City will limit new direct access points to SR 99 and will encourage new development along SR 99 to provide driveway access from local streets instead of the highway.
  - Policy CIRC-7.5: The City will improve the safety and convenience of pedestrian activity along SR 99 and crossings of SR 99 in and around the downtown core area, as funding is available.

- Goal CIRC-8. Ensure seamless and effective transportation throughout the Planning Area and the surrounding region.
  - Policy CIRC-8.2: The City will integrate local transportation planning with regional transportation planning and provide direction to the state and SACOG regarding community preferences for the design of regional transportation routes within Live Oak.
  - Policy CIRC-8.3: The City will consult with the California Public Utilities Commission, Amtrak, Union Pacific Railroad Company, and any other relevant agencies to encourage and accommodate any future opportunities for future regional bus transit and rail stops in Live Oak.

- Implementation Program CIRC-1: The City will assess transportation impact fees and plan transportation improvements based, in part, on LOS analysis and standards described in this Circulation Element. The City will also explicitly consider the impact of traffic improvements on pedestrian, bicycle, and public transit safety and convenience. The City will allow exceedance of vehicular LOS for future development projects, if necessary. Transportation investments will be implemented according to the following guidance:
  - Roadway or intersection widening is a less desirable type of mitigation for traffic impacts and generally should be considered after other options are exhausted.
  - The City will seek to improve roadway capacity by timing lights to optimize LOS at congested intersections.
  - The City will seek opportunities to decrease congested routes by providing more connectivity and route choice options.

  In areas where proposed development would result in exceeding the local LOS standards, the developer(s) shall redesign the project to increase connectivity, enhance

bicycle/pedestrian/transit access, or through other means to meet LOS standards. After all feasible site planning approaches are exhausted, if LOS is still exceeded, projects will contribute on a fair-share basis for street improvements required to bring the areas roadways to within the City's LOS standards. Improvements needed to accommodate new growth shall not be funded by existing city residents or businesses.

In general, traffic mitigation programs in Live Oak will be structured to provide incentives for projects to reduce their per-unit and per-employee trip generation rates. Traffic impact fees for new developments in Live Oak shall not be calculated simply on a per-unit basis, but will consider the number of bedrooms and type of home (townhome, apartment). It is important to take into account the substantial variations in actual trip generation of the full range of residential types. Commercial traffic impact fees shall not be calculated simply on a squarefootage basis, but will take into account whether the commercial project is designed to attract drivers or oriented toward pedestrians and neighborhoods. Projects that rely on highway traffic have higher traffic generation rates, and therefore relatively higher contribution toward roadway improvements. Retail and service establishments located and designed for pedestrian, transit, and bicycle access will have comparatively lower traffic impact fees. This approach applies to new development rather than redevelopment or the change of use or user in existing developments.

- Implementation Program CIRC-2: The City will consult with the Sacramento Area Council of Governments to revise the local approach to traffic impact analysis to take advantage of emerging, more sophisticated, land use, density- and design-sensitive modeling techniques. The City will promote the use of land use/transportation modeling that is sensitive to not only land use, but also pedestrian-oriented design. When calculating traffic impacts of development projects, the City will encourage the use of models that show reduced trip-generation rates for higher residential densities. Traffic modeling will be sensitive to the travel demand benefits of building homes and destinations near each other, projects that reduce parking and bring buildings to the street, and other proven land use planning and site design techniques. Modeling and impact assessment will show transportation benefits for projects that provide and promote convenient transit access. Other future methods to reduce Live Oak residents' need to drive will be included in City-approved traffic reports, as appropriate. Projects located and designed to manage travel demand in the City will enjoy correspondingly lower traffic impact fees.

- Implementation Program CIRC-4: Following adoption of the General Plan, the City will revise the Zoning Ordinance, Subdivision Ordinance, and Public Works Improvement Standards, as necessary, to ensure a highly connected transportation system. Revisions to these implementing documents will be consistent with Circulation Element, and will include such items as:

  - establish maximum block sizes in residential, mixed-use, and commercial areas;
  - require stubbing of streets to adjacent planned development areas;
  - establishment of a minimum connectivity index, particularly near Neighborhood Centers and Civic Centers, in order to ensure multiple route choices and emergency access; and,
  - specify exceptions to connectivity standards.

- Implementation Program CIRC-5: Following adoption of the General Plan, the City will revise the off-street parking requirements, as necessary, based on policy in this Circulation Element. Since different land uses have different peak demand periods, it is often cost-effective in the short- and long-term for property owners, land developers, end users, and the City alike to encourage joint- or shared-use parking, particularly in mixed use areas. Revisions in the off-street parking standards required to better optimize the amount of surface parking provided in different areas of the City will be considered. The following guidelines should be considered in revisions to implementing documents:
  - Off-street parking requirements may be reduced for projects located in Centers (e.g., Neighborhood Centers and Civic Centers) and in the downtown core area, as well as for affordable housing projects.
  - Consider opportunities to reduce residential off-street parking requirements for multifamily units and/or other medium and high density housing.
  - Consider reducing or eliminating off-street parking requirements for guest parking in locations where on-street parking is provided.
  - Parking for nonresidential development may be reduced if located in Centers, where onstreet parking is provided, or if parking can be shared with adjacent uses with different timing for parking needs.
  - Parking requirements should specify minimum parking, as with the current code, as well as parking *maximums*, in order to create a pedestrian-friendly environment. The City will retain the discretion to approve projects proposing parking above the maximum with conditions, such as providing parking lot shading beyond that required by City standards.

- Implementation Program CIRC-6: Following adoption of the General Plan, the City will analyze future mixed-use development potential in the downtown core area and the ability to accommodate new parking needs through provision of on-street parking. Both existing and future street connections will be considered for adding on-street parking. Wide streets might accommodate diagonal parking on one or both sides. Narrower streets might only accommodate parallel parking. The future amount of on-street parking will be compared with the parking demand of future mixed-use development, considering the different daily periods of peak demand for different land uses. The findings of this study should inform changes to the City's off-street parking requirements and Improvements Standards for downtown core area streets, as appropriate. The City may also choose to instead conduct the above parking analyses as a part of an overall downtown core area plan.

- Implementation Program CIRC-7: Following adoption of the General Plan, the City will revise the Street Design Criteria, as necessary, to implement policy of this Circulation Element. As a part of these revisions, the City will consider pedestrian-friendly street standards, especially for areas where high pedestrian activity is anticipated. The following guidelines should be considered in revisions to the City's Improvement Standards:
  - Driveways may be constructed using pervious surfaces (such as porous concrete, porous cement, pavers, turf-blocks), or other designs and materials that reduce stormwater runoff.
  - Shared driveways are encouraged in zero lot line, courtyard, and other compact single-family residential designs, as well as in multifamily housing.
  - Curb radii in new growth areas should be reduced. Consider 15–20 feet for local streets, 20–25 feet for minor collectors, and 25–30 feet for major collectors.

- Street intersections should follow a four-way grid or modified grid pattern.
- Roundabouts and traffic circles can be used to control traffic at intersections, particularly those without a perfect 90-degree orientation.

- Implementation Program CIRC-8: The City will seek funding to work collaboratively with Caltrans (and SACOG, as appropriate) to prepare a conceptual corridor plan for SR 99. The plan should include such design components as wide, separated sidewalks, street trees and other landscaping, street furniture, and other amenities, as appropriate. The plan will provide conceptual design guidance for SR 99 property frontage, as well as the SR 99 right-of-way. The plan will identify priorities for phasing and financing of these improvements. This conceptual corridor plan will identify local preferences for improvements to the highway itself, which would be pursued by Caltrans in coordination with the City later. The City will accommodate Caltrans design and engineering standards, but will not include preliminary engineering as a part of this corridor plan, which is meant instead to identify preferred conceptual approaches, consistent with the General Plan. With this conceptual corridor plan, the City will proactively seek funding to implement segments of corridor improvements over time. Aspects of this streetscape plan will be integrated into the City's Improvement Standards, as appropriate. The City and Redevelopment Agency may fund and/or implement sections of this streetscape plan in advance of development, with fair-share contribution of benefiting properties to reimburse the City or Redevelopment Agency when they develop. The City will consider ongoing reimbursement payments rather than a single up-front payment where necessary to encourage redevelopment of the SR 99 corridor.

- Implementation Program-CIRC-9: On an ongoing basis, the City will identify priority transportation improvements in the existing developed City consistent with the Circulation Element and include such improvements in grant applications, capital improvements planning, and through other funding mechanisms, as appropriate.

- Implementation Program-CIRC-12: Following General Plan adoption, the City will monitor the number of pedestrians crossing the railroad at Kola Street, Pennington Road, and Elm Street, Riviera Road, the new Road 11/Road 10/Coleman Avenue crossing (if constructed), and Paseo Avenue. As necessary, the City will pursue improvements and maintenance of adequate traffic and pedestrian controls at each location, including installation of fencing to limit access to the railroad, in order to ensure safety. The City will seek funding for safe pedestrian and bicycle crossings of the railroad and/or SR 99 at approximately Epperson Way, Road F, and Road 10/Bishop Avenue/Coleman Avenue, among other appropriate locations.

Community Character Element

- Goal DESIGN-1: Provide connected streets with features and amenities that accommodate many travel modes.
  - Policy DESIGN-1.2: Civic Centers and Neighborhood Centers; parks; civic landmarks; and schools shall be connected by streets, multi-use trails, and pedestrian paths, so that people may comfortably and conveniently reach these destinations by foot, bicycle, car, and bus.
  - Policy DESIGN-1.4: If cul-de-sacs are used, they should allow pedestrian and bicycle through connectivity to adjacent trails or streets.

  - Policy DESIGN-1.8: Street intersections in areas with high pedestrian traffic or high vehicle traffic should have distinctive crosswalks with different paving patterns, painting, landscaping, and other aesthetic/safety enhancements.
  - Policy DESIGN-1.9: The City encourages the use of traffic calming devices, such as bulb-outs, crosswalks, pedestrian refuges, planted medians, speed humps, traffic circles, and other passive speed control measures, where appropriate.
  - Policy DESIGN-1.10: As funding permits, the City will seek to install traffic calming and pedestrian and bicycle improvements in existing neighborhoods and commercial areas where high traffic speeds are a problem.
  - Policy DESIGN-1.11: The City will coordinate with Union Pacific and the Public Utilities Commission to install and improve safe and accessible railroad crossings.
- Goal DESIGN-2: Design streetscapes to create attractive and comfortable spaces for people.
  - Policy DESIGN-2.1: New streets shall provide comfortable travel areas for pedestrians, bicyclists, and drivers to facilitate multi-modal travel.
  - Policy DESIGN-2.2: Local and minor collector streets should have narrower travel areas for vehicles than arterial streets in order to provide safe and comfortable environment for pedestrians and bicyclists.
- Goal DESIGN-4: Neighborhoods that foster a sense of community and support pedestrian activity.
  - Policy DESIGN-4.4: Residences should be designed and configured to integrate with open spaces, such as parks or greenbelts, using design methods such as those described below.
    - Parks and open space in residential neighborhoods should provide convenient and safe pedestrian access.
- Goal DESIGN-8: Promote Downtown as a vital, people-oriented place.
  - Policy DESIGN-8.1: The City will maintain and enhance a strong pedestrian orientation downtown through the design of buildings, streets, and open spaces.
- Goal DESIGN-10: New and existing commercial centers accommodate multiple travel modes.
  - Policy DESIGN-10.1: The City will require a strong pedestrian orientation through the design of buildings, streets, and sidewalks in neighborhood centers and commercial and mixed-use projects.
  - Policy DESIGN-10.2: Site and building access for pedestrians and bicyclists should be provided as directly as possible from sidewalks and parking areas to building entrances, while minimizing conflicts with motor vehicle traffic.

- Implementation Program DESIGN-1: Following adoption of the 2030 General Plan, the City will adopt changes to Municipal Code and revisions to the Public Works Improvements Standards for consistency with the 2030 General Plan, including any changes needed to be consistent with the Community Character and Design Element. Such changes may include revising the maximum block size to encourage pedestrian and bicycle convenience, shorten vehicle trips, and ensuring adequate emergency access. Standards for cul-de-sacs may need to be revised to show pedestrian and bicycle through connections. The City will adopt standards for alleyway design that provides flexibility for creative project design. Landscaping standards will be revised to encourage the use of drought-tolerant, low-maintenance plants. Street tree standards may also be revised according to the direction in this Element.

  The Zoning Ordinance will be revised to provide flexibility in setbacks and other components of development standards in order to accommodate zero-lot line projects, z lots, zipper lots, and other creative site design approaches. The Zoning Ordinance will also be revised to implement new land use designations, such as Downtown Mixed Use and Neighborhood Commercial Mixed Use. Within these designations, the Zoning Ordinance will include development standards that encourage outdoor seating. The City will also establish more flexible setback requirements along Highway 99 to promote sidewalk activity and site retail uses facing and opening up onto sidewalks and plazas.

- Implementation Program DESIGN-3: Following adoption of the 2030 General Plan, the City will explore funding opportunities for a downtown strategic plan to implement the General Plan. This follow-on planning effort could have many different components, including but not limited to:
  - Analyze parking that could be provided in diagonal and parallel parking spaces on-street downtown and compare to anticipated future residential and nonresidential buildout to determine what, if any, surface parking may be needed to meet future demand (including an analysis of different peak demand periods for different land uses);
  - Implement downtown core area improvements, including street tree planting, landscaped planters, street furniture, Highway 99 re-design elements, sidewalks, enhancements to pedestrian crossings; downtown theme for signage and other streetscape amenities; and other improvements.

- Implementation Program DESIGN-4: Following adoption of the 2030 General Plan, the City will consider preparation of a plan for improvements along Highway 99. This plan will describe improvements, including landscaping, trees, accessible sidewalks, automobile and pedestrian-scaled lighting, bus shelters, trash receptacles, crosswalks, and other streetscape amenities. Where appropriate opportunities and sufficient right-of-way exists, the City will work with Caltrans to modify Live Oak Boulevard/Highway 99 with landscaped strips between the roadway and sidewalks to visually and functionally enhance streets for pedestrian use. The City will coordinate with Caltrans on this plan, as well as the business community and property owners along Highway 99. If appropriate, this improvement plan may become a part of the City's Public Works Improvements Standards and/or Capital Improvements Programming.
- Implementation Program DESIGN-6: The City will pursue streetscape improvements including sidewalks, street trees, and additional landscaping throughout the existing developed community.

- Implementation Program DESIGN-7: Following adoption of the 2030 General Plan update, the City will seek funding to prepare comprehensive streetscape plans for Pennington Road. Plans will include elements such as street trees, distinctive crosswalks and sidewalks, traffic calming elements, street lighting, benches, shelters, fountains, bike racks, trash receptacles, and public art. Existing plans for improvements to Pennington Road would be included in this comprehensive streetscape planning process.

Public Utilities, Services, and Facilities Element

- Goal PUBLIC-7: Support high-quality public schools to meet the needs of current and future Live Oak residents.
    - Policy PUBLIC-7.1: The City will coordinate with the Live Oak Unified School District to determine appropriate locations for new schools. If possible, schools should be located within Civic Centers and within walking or biking distance of all homes within their attendance boundaries.
    - Policy PUBLIC-7.5: The City will ensure that areas around planned school sites offer safe and convenient pedestrian and bicycle access from the surrounding neighborhood. New developments shall provide safe routes to and from school sites from surrounding planned neighborhoods.

Parks and Recreation Element

- Goal PARKS-1: Provide a variety of parkland in the existing developed City to meet park standards.
    - Policy PARKS-1.5: The City will seek opportunities to construct linear parks with pedestrian/bicycle pathways that connect homes and destinations and address existing deficiencies relative to the City's parkland acreage standards.
- Goal PARKS-4: Become a countywide or regional center for recreation.
    - Policy PARKS-4.1: The City will proactively coordinate with Sutter County and Yuba City to identify regional park and recreation needs, such as regional parks or trails, which could be planned, jointly funded, and developed in Live Oak.

City of Live Oak Municipal Code 17.25.090 Bicycle Parking (2015)

A. Spaces required:

1. Commercial, Industrial: 3 percent of required auto parking
2. Cultural, library, trade schools, business colleges and other commercial schools: 10 percent of required auto parking

B. Location

Bicycle facilities shall be located to be at least as convenient as the majority of vehicular parking areas.

C. Bicycle facility standards

Bicycle parking facilities shall include a stationary parking device to adequately support and safely secure the bicycle. This includes equipment to which the bicycle frame and wheels may be locked.

Collaborative Highway 99 Streetscape Master Plan (2011)

The streetscape master plan was developed by the City of Live Oak in collaboration with Caltrans and local stakeholders to establish conceptual guidance for improvements along Highway 99 within Live Oak to enhance aesthetics, safety, multi-modal accessibility, and quality of life for residents and visitors. Guidelines relevant to the Live Oak Bicycle, Pedestrian & Trails Plan include:

- Minimize driveway cuts directly from the highway.
- Connect land uses and Class I trails planned on either side of the highway. Promote use of pedestrian/bike overpass, underpass along Live Oak Slough, or at-grade crossings of Highway 99 to enhance pedestrian environment around the Plan Area.

Recommended improvements are organized into three corridor segments: North New Growth Area from Riviera Road to Nevada Street, Downtown Core Area from Nevada Street to Ash Street, and South New Growth Area from Ash Street to Paseo Avenue. Relevant constraints and opportunities for each segment are outlined below. Constraints and opportunities for the two New Growth Areas are discussed in the plan as a unit because of their similar contexts.

Downtown Core Area

Constraints:

- Highway crossings can be dangerous for pedestrians, especially in areas without formalized crossings and signals. This is a particular concern for school kids crossing from adjacent residential areas.
- Adequate streetlights are needed at crosswalks and near restaurants and businesses to promote pedestrian and bicyclist visibility during the night.
- Discontinuous sidewalks near the northern and southern ends of the downtown area.
- In the newer retail areas, sidewalks are directly adjacent to highway travel lanes.
- There is no street or pedestrian furniture.
- Buildings along the highway are set back from the travel lanes, which creates empty space and a vacuous feeling that is neither inviting nor pleasant for pedestrians and bicyclists.
- Most parking is in front of buildings with drive cuts from the properties to the highway, creating pedestrian and vehicular conflicts.

Opportunities:

- Three existing at-grade crossings at Kola Street, Pennington Road and Elm Street connecting the east and west sides of the community can be enhanced further with pedestrian and bicyclist improvements.
- Create a continuous sidewalk along the highway connecting the existing and new developments.
- Include bollards or other designed buffers on sidewalks directly adjacent to travel lanes to increase the perception of safety among pedestrians.
- Reduce travel speeds (below 35 mph within the downtown area) to allow a safer pedestrian environment.
- Identify transit stops in areas that will be accessible to and comfortable for pedestrians and bicyclists.
- Provide seating areas—for example, near renovated railway depot, park, and restaurants; with attention to the need for an appropriate noise environment.
- Provide adequate parking for existing and future uses to the side or back of the building and additional parking on the street on local streets to create a more pedestrian-friendly and inviting environment.
- Access parking on side and back via local streets, where possible, to reduce conflicts.

North and South New Growth Areas
Constraints:

- Existing travel speed is 45 mph to 55 mph, which is not conducive to pedestrian activity.
- Existing and planned destinations (such as school, library, and restaurants) are on both sides of the highway and safe crossing points are needed.
- Inadequate street lighting discourages pedestrian use at night.

Opportunities:

- Link planned off-street bike trails parallel to the highway (but not within the highway right-of-way) to pedestrian facilities provided along the highway.
- Plan for reduced vehicular ingress and egress conflicts in the New Growth Areas (compared with developed Highway 99 areas).
- Reduce speed moving into the Downtown Core Area with visual cues of bicycle and pedestrian activity, such as signage, sidewalks, crosswalks, buildings closer to the travel lanes, denser landscaping, or other design features.

Community and Economic Development Action Plan (2015)

The Live Oak City Council develops an annual action plan to meet key city goals, with a ten year planning horizon. Key themes and goals from the 2015 plan include:

- Improve the Highway 99 corridor to create a positive impression of the Live Oak community
- Increase the number and diversity of businesses in the community
- Help local businesses prosper
- Improve infrastructure in the community, including streets, sidewalks, lighting, signage, community facilities, and more
- Provide strong recreational and community event programming to celebrate Live Oak's diversity and bring the community together

The plan includes a number of objectives and action items organized under four 'building blocks.' Those relevant to the Live Oak Bicycle, Pedestrian & Trails Plan include:

Building Block 1: Establish Live Oak as a prosperous, livable community with its own unique character

1.1 Set Live Oak apart from other communities on the SR 99 corridor through quality design and development

- 1.1.1 Complete and adopt new Public Works Improvements Standards
- 1.1.2 Ensure appropriate application of Citywide Design Guidelines to all projects

1.2 Establish a connection between the community and the natural resource assets that surround it

- 1.2.1 Create a common design for directional signage within the community that makes a visual connection to the surrounding natural resources (e.g. Buttes, oak trees, river, waterfowl, fish)
- 1.2.2 Identify one or more locations along the SR 99 corridor (as recommended in SR 99 Corridor Streetscape Master Plan) for "Welcome to Live Oak" signage, and install signs
- 1.2.5 Complete a bike/pedestrian master plan including outreach to Sutter County and Yuba City on collaborating on a safe, scenic bicycle route linking all Sutter County incorporated and unincorporated communities. Special emphasis should be places on safe routes to the Feather River and Sutter Buttes

Building Block 2: Have available decent and affordable housing and neighborhoods for all income levels

2.4 Continue to invest in parks and open space within the community

- 2.4.2 Seek funding for Live Oak Recreation Trail phases 2 and 4

2.5 Complete road and infrastructure improvement projects supporting neighborhoods including:

- 2.5.1 Complete SACOG-funded Project Approval/Environmental Document (PA/ED) for Phase 1 of SR 99 corridor improvements (approximately Ash Street north to Ramsdell)
- 2.5.2 Complete Pennington Road Reconstruction (Broadway to Connecticut)
- 2.5.3 Pursue funding for Kola Street improvements

2.6 Improve street lighting within the Live Oak community

- 2.6.1 Identify areas within the community with inadequate street lighting
- 2.6.2 Develop strategy to prioritize and fund streetlight improvements

2.7 Identify candidate sites for new sidewalks

Sutter County Pedestrian & Bicycle Master Plan (2012)

The Sutter County Pedestrian & Bicycle Master Plan, adopted in 2012, includes the following findings, goals, and policies relevant to the Live Oak Bicycle, Pedestrian & Trails Master Plan effort:

- Survey respondents expressed a desire for improved bicycle access on levee access roads, roads around the Sutter Buttes, and connections from rural areas to Yuba City.
- Goal 1: Safe and Convenient Bike and Pedestrian Access
  - Coordinate bike lane and bike route improvements with road pavement overlay or widening projects wherever feasible.
  - Provide sidewalks in medium to high density residential areas and all employment development.
  - Develop a regular maintenance program to keep existing bike facilities clean and in good repair.
  - Improve bicycle and pedestrian access across major highways through signalization.
  - New subdivisions should be designed to permit access to bikeways from interior residential streets (IE access ways at the ends of cul-de-sacs).
  - Work with school districts to develop "Safe Routes to Schools" programs.
- Goal 4: Demonstrate County Commitment to Bike and Pedestrian Improvements
  - Coordinate a Bike Safety and Education program with Yuba City and Live Oak.
  - Identify and co-sponsor private bike related events (IE Bike Around the Buttes, May is Bike Month, etc.)
  - Prepare and distribute a yearly survey to solicit input regarding pedestrian routes, bike use, recommended improvements, etc.

Proposed bikeways in the Live Oak planning area include:

- Class II bike lanes on Pennington Road east of Live Oak
- Class III bike route on Pennington Road west of Live Oak
- Class III bike route on Larkin Road north of Live Oak
- Class III bike route on Larkin Road south of Live Oak
- Class III bike route on Township Road

All these projects are classified as "Tier A" improvements, to be prioritized for short-term implementation. See **Figure A-2** for a map of all bicycle projects in the county.

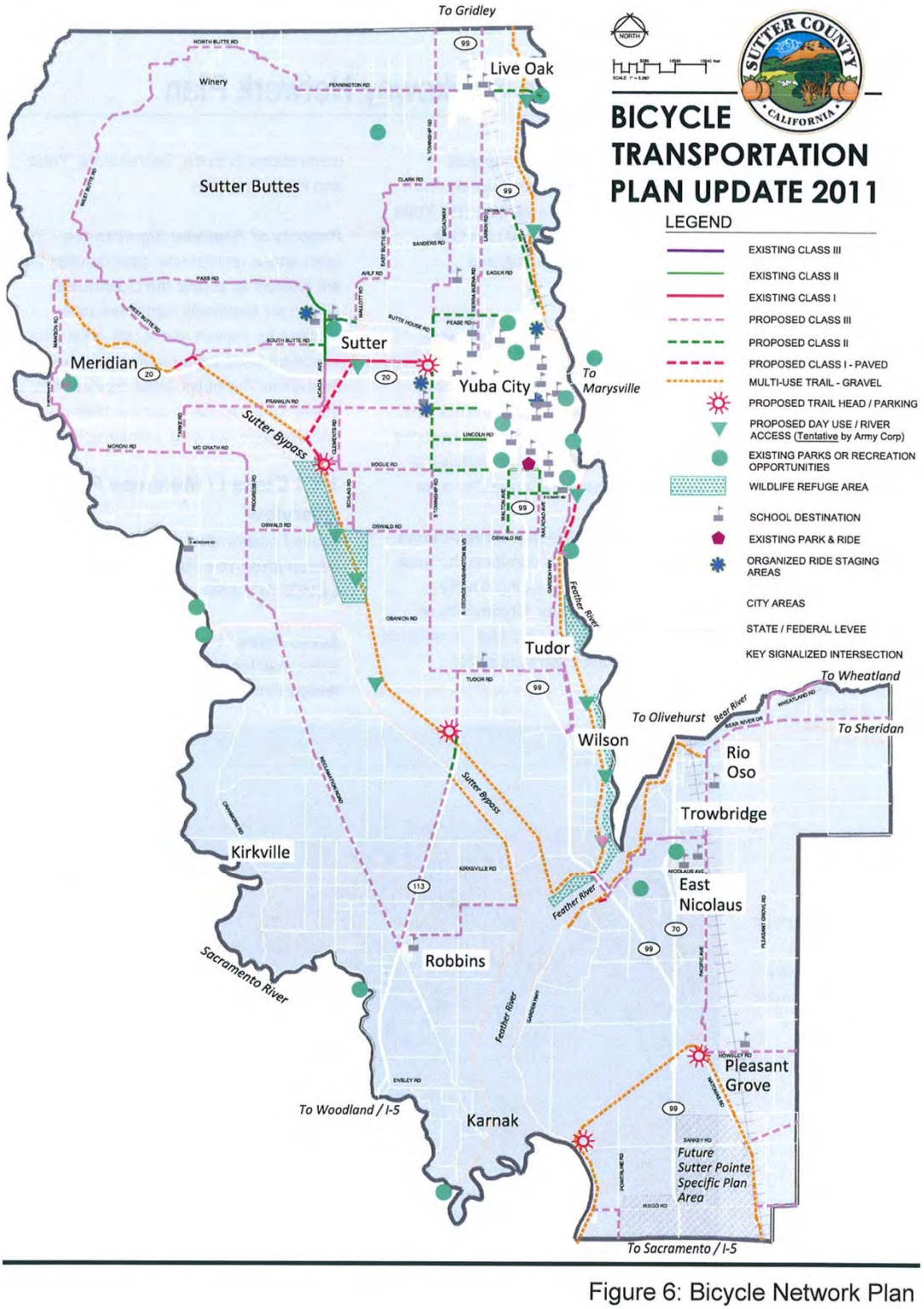

Figure A-2: Sutter County Bicycle Transportation Plan – Bicycle Network Map

Sacramento Area Council of Governments Regional Transportation Plan

The Sacramento Area Council of Governments (SACOG) Regional Bicycle, Pedestrian, and Trails Master Plan identifies a comprehensive list of projects throughout the Sacramento region; projects must be included in this list to be eligible for regional SACOG funding. The plan emphasizes transportation choices as one of its core principles, saying "the more people walk…the less they need to drive alone in their cars. Less driving alone means less congestion and less air pollution."

Goals that are relevant to this planning effort include:

Goal 1: Increase and improve bicycle and pedestrian access and mobility for residents and visitors of all ages and abilities.

Goal 2: Improve and maintain the quality and operation of bikeway and walkway networks.

Goal 3: Improve bicycle and pedestrian safety.

Goal 6: Increase education, encouragement, and awareness programs about bicycle and pedestrian travel.

Goal 7: Create a comprehensive regional bicycling and walking network within and between communities with strong current and future demand.

Goal 8: Increase collaboration among stakeholders throughout the region to seek funding and implement bicycle and pedestrian projects, programs, and related efforts.

No regional infrastructure projects were identified in the Live Oak area. SACOG is currently updating this plan.

Statewide Plans and Policies

AB 32 – Global Warming Solutions Act (2006) & SB 375 – Sustainable Communities and Climate Protection Act (2009)

The past five years have seen an expansion of legislative and planning efforts in California to reduce emissions of greenhouse gases (GHGs) in order to mitigate climate change. Assembly Bill 32, the California Global Warming Solutions Act of 2006, aims to reduce the state's GHG emissions to 1990 levels by 2020 and to 80 percent below 1990 levels by 2050. Meanwhile, Senate Bill 375, passed into law in 2008, is the first in the nation that will attempt to control GHG emissions by directly linking land use to transportation. The law required the state's Air Resources Board to develop regional targets for reductions in GHG emissions from passenger vehicles for 2020 and 2035 as a way of supporting the targets in AB32.

AB 1358 – Complete Streets Act (2008)

In future years, all jurisdictions will have to incorporate complete streets into their planning. Assembly Bill 1358 requires "that the legislative body of a city or county, upon any substantive revision of the circulation element of the general plan, modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users [including] motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation…." This provision of the law went into effect on January 1, 2011, and can be expected to result in a new generation of circulation elements and a surge in complete streets policies around the state as general plans are updated over time.

SB 99 – Active Transportation Program Act (2013)

The Active Transportation Program was established by this legislation in 2013, and serves as the mechanism for distributing federal funds for local and regional efforts to promote walking and bicycling. It specifies goals that the funding will be disbursed to help meet, including increasing the mode shares of biking and walking trips, increasing safety for non-motorized users, and providing support to disadvantaged communities to promote transportation equity.

Caltrans Complete Streets Policy (2001) and Deputy Directive 64 (2008)

In 2001, the California Department of Transportation (Caltrans) adopted Deputy Directive 64, "Accommodating Non-Motorized Travel," which contained a routine accommodation policy. The directive was updated in 2008 as "Complete Streets – Integrating the Transportation System." The new policy includes the following language:

> The Department 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.
>
> The Department 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 operations.

The directive establishes Caltrans' own responsibilities under this policy. The responsibilities Caltrans assigns to various staff positions under the policy include the following:

- 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 identifies during system and corridor planning, project initiation, scoping, and programming.
- Ensure incorporation of bicycle, pedestrian, and transit travel elements in all Department transportation plans and studies.
- Promote land uses that encourage bicycle, pedestrian, and transit travel.
- Research, develop, and implement multimodal performance measures.

In part to address these issues, Caltrans adopted the Complete Streets Implementation Action Plan in 2010. The plan sets forth actions under seven categories to be completed by various Caltrans districts and divisions within certain timelines to institutionalize complete streets concepts and considerations within the department. The action categories include updating departmental plans, policies, and manuals; raising awareness; increasing opportunities for training; conducting research projects; and actions related to funding and project selection. As one of its implementation activities, Caltrans updated the Highway Design Manual in large part to incorporate multi-modal design standards.

California Transportation Plan 2025 (2006)

The California Transportation Plan 2025 seeks to provide for mobility and accessibility of people, goods, services, and information throughout California. It encourages consideration of bicycle and pedestrian facilities in capacity improvement projects, and promotes integration of active transportation into modeling and projection efforts.

The Plan also speaks to the public health benefits of active transportation, urging better education of youth on personal health and air quality impacts of making trips by bicycle or on foot.

Federal Plans and Policies

US DOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations (2010)

The United States Department of Transportation (US DOT) issued this Policy Statement to support and encourage transportation agencies at all levels to establish well-connected walking and bicycling networks. The following Policy Statement and actions are relevant to the Live Oak Bicycle, Pedestrian and Trails Plan.

Policy Statement

The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide – including health, safety, environmental, transportation, and quality of life – transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

Recommended Actions

The DOT encourages States, local governments, professional associations, community organizations, public transportation agencies, and other government agencies, to adopt similar policy statements on bicycle and pedestrian accommodation as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. In support of this commitment, transportation agencies and local communities should go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks. Such actions should include:

- Considering walking and bicycling as equals with other transportation modes: The primary goal of a transportation system is to safely and efficiently move people and goods. Walking and bicycling are efficient transportation modes for most short trips and, where convenient intermodal systems exist, these nonmotorized trips can easily be linked with transit to significantly increase trip distance. Because of the benefits they provide, transportation agencies should give the same priority to walking and bicycling as is given to other transportation modes. Walking and bicycling should not be an afterthought in roadway design.
- Ensuring that there are transportation choices for people of all ages and abilities, especially children: Pedestrian and bicycle facilities should meet accessibility requirements and provide safe, convenient, and interconnected transportation networks. For example, children should have safe and convenient options for walking or bicycling to school and parks. People who cannot or prefer not to drive should have safe and efficient transportation choices.
- Going beyond minimum design standards: Transportation agencies are encouraged, when possible, to avoid designing walking and bicycling facilities to the minimum standards. For example, shared-use paths that have been designed to minimum width requirements will need retrofits as more people use them. It is more effective to plan for increased usage than to retrofit an older facility. Planning projects for the long-term should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements.

- Integrating bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges: DOT encourages bicycle and pedestrian accommodation on bridge projects including facilities on limited-access bridges with connections to streets or paths.
- Collecting data on walking and biking trips: The best way to improve transportation networks for any mode is to collect and analyze trip data to optimize investments. Walking and bicycling trip data for many communities are lacking. This data gap can be overcome by establishing routine collection of nonmotorized trip information. Communities that routinely collect walking and bicycling data are able to track trends and prioritize investments to ensure the success of new facilities. These data are also valuable in linking walking and bicycling with transit.
- Setting mode share targets for walking and bicycling and tracking them over time: A byproduct of improved data collection is that communities can establish targets for increasing the percentage of trips made by walking and bicycling.
- Improving nonmotorized facilities during maintenance projects: Many transportation agencies spend most of their transportation funding on maintenance rather than on constructing new facilities. Transportation agencies should find ways to make facility improvements for pedestrians and bicyclists during resurfacing and other maintenance projects.

Past Expenditures for Bicycle and Pedestrian Facilities and Programs

Project ID	Project Title	Description	EA Number	Year
STPL-5297(001) [Federal-Aid RSTP]	N Street Reconstruction	Reconstruct N Street from Pennington Road to Kola Street (west) including curb, gutter, and sidewalk and drainage improvements	03-928055L	2001
STPLH-5297(002) [Federal-Aid HES]	2004-2005 Hazard Elimination System	Install in-pavement lighted crosswalks on Pennington Road, curb ramps, sidewalk and pavement markings	03-928456L	2007
STPL-5297(003) [Federal-Aid RSTP]	Archer Avenue Reconstruction	Reconstruct Archer Avenue from Larkin Road to 250' east of L Street including curb, gutter and sidewalk, drainage improvements and pavement markings	03-0L1074L	2008
STPL-5297(004) [Federal-Aid RSTP] [Federal-Aid HSIP]	Elm Street Signal	Install traffic signal at the intersection of Elm Street and SR 99 including curb ramps and sidewalk	03-454758	2015
SR2SL-5297(005) [SR2S-State]	Larkin Road SR2S	Construct pedestrian improvements on the west side of Larkin Road from Elm Street to Pennington Road including curb, gutter and sidewalk, curb ramps, bicycle lane signs and pavement markings	03-928962	2012
ESPL-5297(006) [Federal-Aid Stimulus]	Apricot Street Rehabilitation	Rehabilitate Apricot Street from N Street to Broadway including curb ramps and sidewalk	03-929082L	2010
STPL-5297(007) [Federal-Aid RSTP]	Pennington Road Complete Streets Rehabilitation	Pennington Road from Connecticut Avenue to Broadway – Reconstruct roadway and restripe existing bicycle lanes	03-13000035L	Ongoing (2017)
SUT18838 [Federal-Aid CMAQ]	Community Trail Phase 4	Construct Class I Bikeway on abandoned Northern Electric Railway corridor from Kola Street to Epperson Way		Ongoing (2018)

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Appendix B. Design Guidelines

The design guidelines presented in this appendix are a combination of minimum standards outlined by the California Highway Design Manual's design guidelines, recommended standards prescribed by the American Association of State Highway and Transportation Officials (AASHTO) and the California Manual on Uniform Traffic Control Devices (CA MUTCD). These guidelines are intended to support the creation of inviting, walkable and bikeable environments that are compliant with the Americans with Disabilities Act and other policy documents.

The minimum standards for bicycle and pedestrian facilities used in conjunction with the design recommendations for issues specific to the City of Live Oak should provide the foundation for a safe, functional, and inviting bicycle network.

Additional design guidance and details can be found in the following documents:

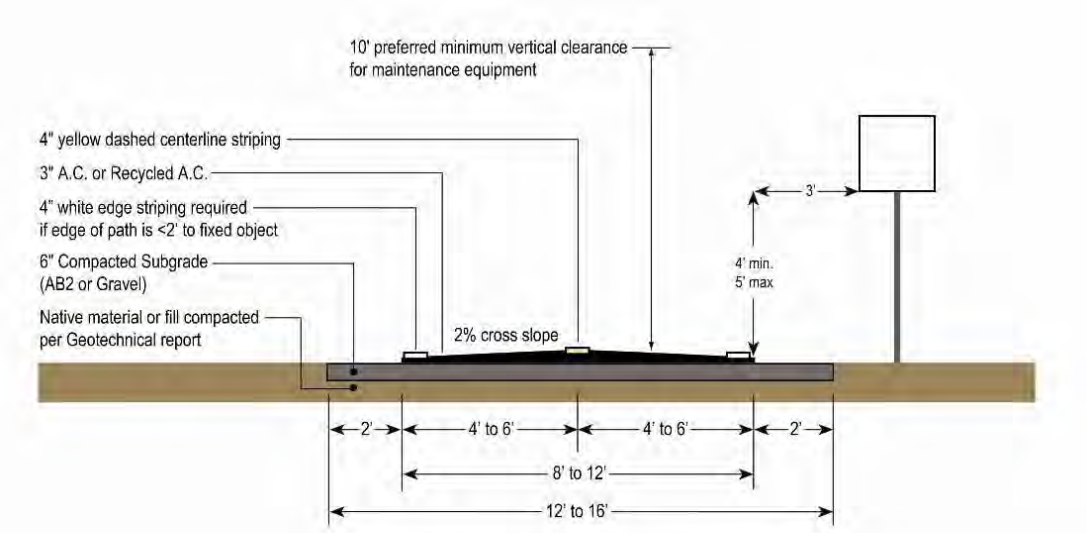
- California Manual on Uniform Traffic Control Devices: http://www.dot.ca.gov/hq/traffops/engineering/mutcd/ca_mutcd2014.htm
- Caltrans Highway Design Manual (2014): http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm
- Caltrans Design Information Bulletins: http://www.dot.ca.gov/hq/oppd/dib/dibprg.htm
- Caltrans Standard Plans.: http://www.dot.ca.gov/hq/esc/oe/project_plans/HTM/06_plans_disclaim_US.htm
- National Association of City Transportation Officials Urban Bikeway Design Guide (endorsed by Caltrans, April 2014): http://nacto.org/cities-for-cycling/design-guide/

This appendix is not intended to replace existing state or national mandatory or advisory standards, nor the exercise of engineering judgment by licensed professionals.

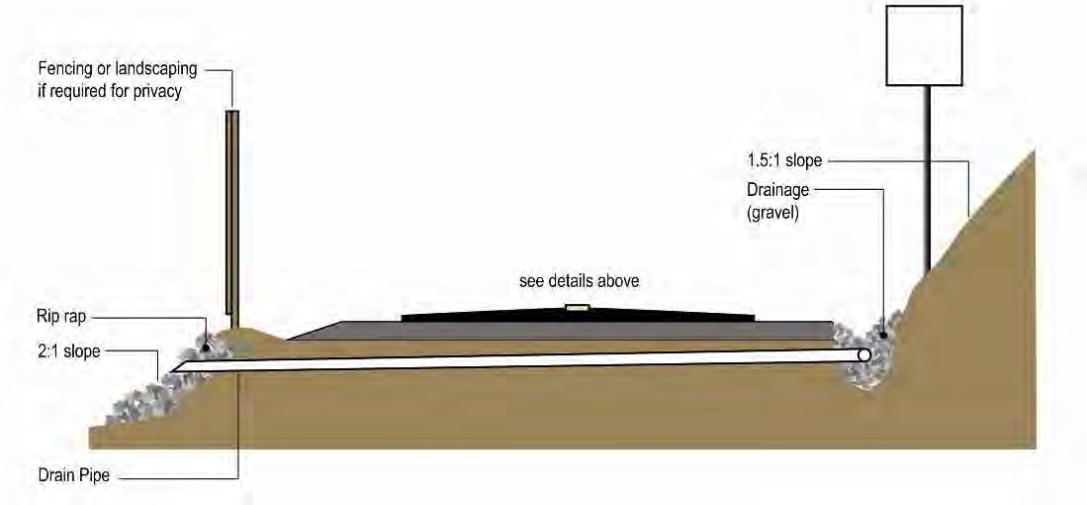
This appendix includes the following guidelines:

Class I Bike Path Minimum Standards

In order to accommodate both bicyclists and pedestrians, Class I paths should be designed to the minimum Caltrans standards shown below. In locations with high use, or on curves with limited sight distance, a yellow centerline should be used to separate travel in opposite directions. High use areas of the pathway should also provide additional width (up to 12 feet) as recommended below. Lighting should be provided in locations where evening use is anticipated, or where paths cross below structures.



Implementation on Level Ground



Summary of Standards

- Eight feet (2.4 meters) is the minimum width for Class I facilities.
- Eight feet (2.4 meters) may be used for short neighborhood connector paths (generally less than one mile in length) due to low anticipated volumes of use.
- Ten feet (3.0 meters) is the recommended minimum width for a typical two-way bicycle path.
- Twelve feet (3.6 meters) is the preferred minimum width if more than 300 users per peak hour are anticipated, and/or if there is heavy mixed bicycle and pedestrian use.
- A minimum 2-foot (0.6 meter) wide graded area must be provided adjacent to the path to provide clearance from trees, poles, walls, guardrails, etc. A 2% cross slope is optimum. On facilities with expected heavy use, a yellow centerline stripe is recommended to separate travel in opposite directions.
- Paths should be constructed with adequate subgrade compaction to minimize cracking and sinking, and should be designed to accommodate appropriate loadings, including emergency vehicles.
- A 2% cross slope shall be provided to ensure proper drainage.
- Stopping sight distance should conform to the California Highway Design Manual.

Additional Considerations

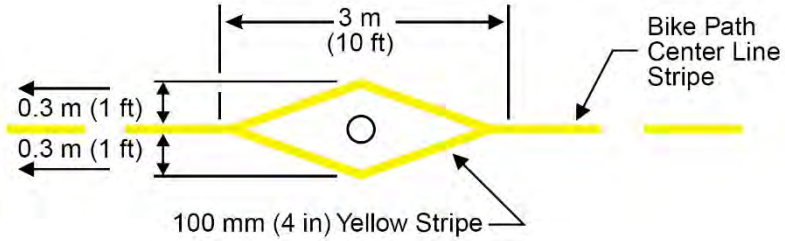
Shared use path facilities that serve primarily a recreation rather than a transportation function, and will not be funded with federal transportation dollars, may not be required to be designed to Caltrans standards. However, state and national guidelines have been created with user safety in mind, and should be followed. Wherever any multi-use pathway intersects with a street, roadway, or railway, standard traffic controls should always be used.

- Class I path crossings of roadways require preliminary design review. Generally, bike paths that cross roadways with average daily trips (ADTs) over 20,000 vehicles will require signalization or grade separation. Consider using bicycle signal heads at locations where paths meet signalized intersections.
- Landscaping should generally be low-water-consuming native vegetation with minimum debris.
- Lighting should be provided where commuters will use the bike path during hours of darkness. Illumination should be no less than 0.17-foot candle average maintained. Lighting should be spaced at a maximum of every 100 feet.
- Barriers at pathway entrances should be clearly marked with reflectors and ADA accessible (minimum five feet clearance).
- Bike path construction should take into account impacts of maintenance and emergency vehicles on shoulders, as well as vertical and structural requirements. Paths should be constructed with adequate subgrade compaction to minimize cracking and sinking.
- The width of structures should be the same as the approaching pathway width, plus minimum two-foot wide clear areas.
- Where feasible, provide two-foot wide unpaved shoulders for pedestrians/runners, or a separate treadway.
- Direct pedestrians to the right side of the pathway with signing and/or stenciling.

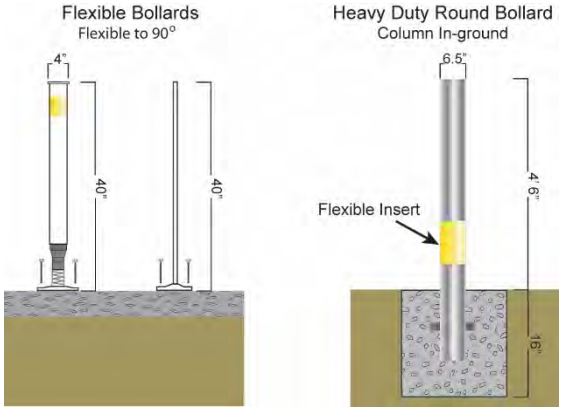
Class I Bike Path Bollards

Minimize the use of bollards to avoid creating obstacles for bicyclists. Bollards, particularly solid bollards, have caused serious injury to bicyclists. The California MUTCD explains, "Such devices should be used only where extreme problems are encountered" (Section 9C.101). Instead, design the path entry and use signage to alert drivers that motor vehicles are prohibited.

- Bollards are ether fixed or removable and may be flexible or rigid. Flexible bollards and posts are designed to give way on impact and can be used instead of steel or solid posts. Bollards are typically installed using one of two methods: 1) The bollard is set into a concrete footing in the ground; and 2) the bollard is attached to the surface by mechanical means (mechanical anchoring or chemical anchor).
- Where removable bollards are used, the top of the mount point should be flush with the path's surface so as not to create a hazard. Posts shall be permanently reflectorized for nighttime visibility and painted a bright color for improved daytime visibility.
- Striping an envelope around the post is recommended.
- When more than one post is used, an odd number of posts at 1.5m (5-foot) spacing is desirable. Wider spacing can allow entry by adult tricycles, wheelchair users and bicycles with trailers.



Barrier Post Striping

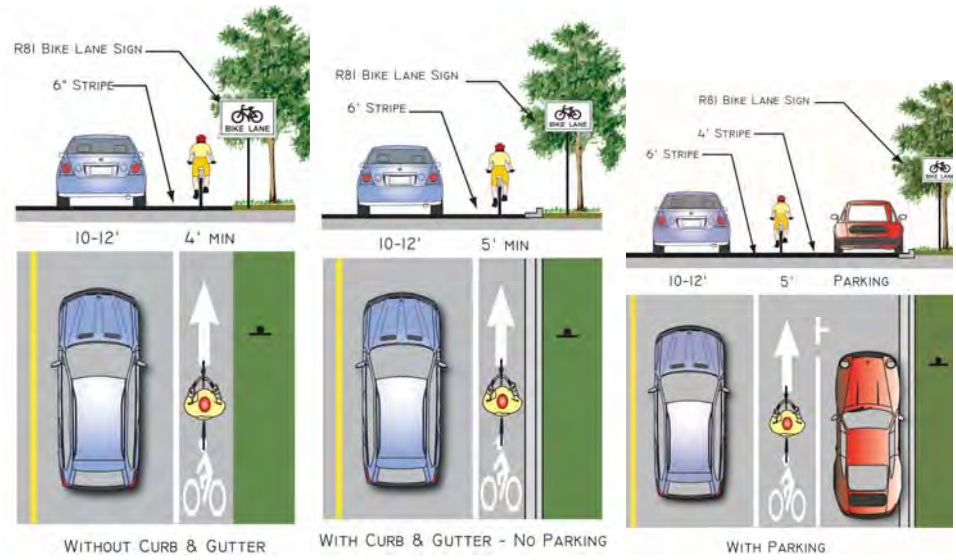


Flexible Bollards
Source: Lighthouse Bollards (L); Andian Sales (R)

Removable Bollards
Source: Reliance Foundry Co. Ltd

Class II Bike Lane Minimum Standards

Chapter 1000 of the Caltrans Highway Design Manual provides standards for bicycle facilities planning and design. These standards outline minimum dimensions, proper pavement markings, signage and other design treatments for bicycle facilities.



Summary of Standards

- Bicycle lanes shall be one-way facilities, running with the direction of traffic.
- Bicycle lanes shall be comprised of a six-inch solid white stripe on the outside of the lane, and a four-inch solid white stripe on the inside of the lane.
- Where on-street parking is allowed, bicycle lanes must be striped between the parking area and the travel lanes.
- Width of bicycle lane:
  - Without an existing gutter, bicycle lanes must be a minimum of four feet wide.
  - With an existing gutter, bicycle lanes must be a minimum of five feet wide measured from the curb face (within the bike lane, a minimum width of three feet must be provided outside the gutter).
  - Where on-street parking stalls are marked and bicycle lanes are striped adjacent to on-street parking, bicycle lanes must be a minimum of five-feet wide.
  - Where on-street parking is allowed but stalls are not striped, bicycle lanes must be a minimum of 12-feet wide measured from the curb face.
  - Depending on the type and frequency of traffic, wider bicycle lanes may be recommended.

Additional Considerations

Intersection and interchange treatment—Caltrans provides recommended intersection treatments including bike lane "pockets" and signal loop detectors. The City should develop a protocol for the application of these recommendations, so that improvements can be funded and made as part of regular improvement projects.

- Bike lane pockets (min. four-feet wide) between right turn lanes and through lanes should be provided wherever available width allows, and right turn volumes exceed 150 motor vehicles/hour.
- Word and symbol pavement stencils should be used to identify bicycle lanes, as per Caltrans and MUTCD specifications.
- Bicycle lanes constructed on roadway shoulders that share use with slow moving agricultural equipment should be constructed with three-inch asphalt concrete over six-inches of aggregate base rock.

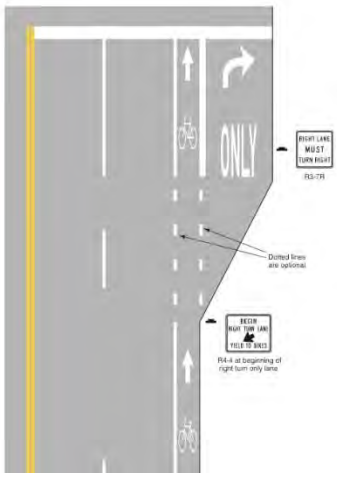
Class II Bike Lane at Intersection with Right Turn Only Lane

A bicyclist continuing straight through an intersection from the right of a right turn lane would be inconsistent with normal traffic behavior and would violate the expectations of right-turning motorists. Specific signage, pavement markings and striping are recommended to improve safety for bicyclists and motorists.

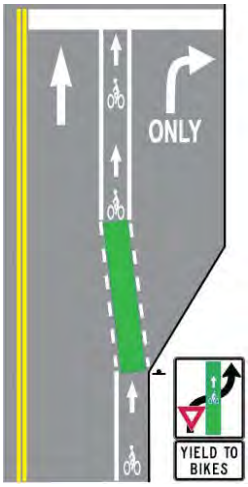
The appropriate treatment for right-turn only lanes is to place a bike lane pocket between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to drop the bike lane entirely approaching the right-turn lane. The figures below illustrate a bike lane pocket, with signage indicating that motorists should yield to bicyclists through the merge area.

- Dropping the bike lane is not recommended, and should only be done when a bike lane pocket cannot be accommodated.
- Travel lane reductions may be required to achieve this design.
- Bicycle through-lanes should never be marked to the right of a right-turn only lane.

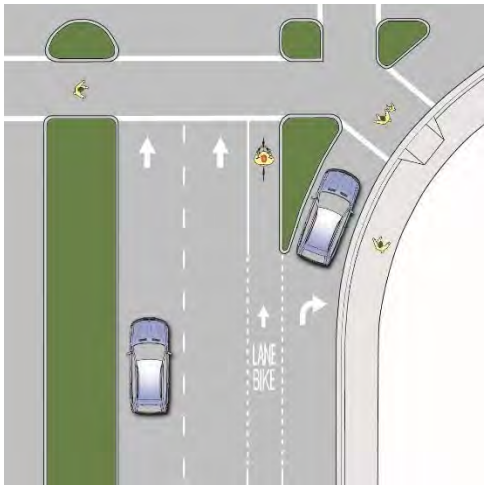
Some communities use colored bicycle lanes through the conflict zone.



Bike lane next to a right turn only lane



Colored bike lanes used to designate a conflict zone



Bike lane next to a right turn only lane separated by a raised island

Class III Bike Route Minimum Standards

Bike routes, or Class III bicycle facilities, are defined as facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes, however can be used on higher volume roads with wide outside lanes or with shoulders. Bike routes can be established along through routes not served by shared use paths (Class I) or bike lanes (Class II), or to connect discontinuous segments of bikeway. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

Bicycle routes can employ a large variety of treatments from simple signage to complex treatments including various types of traffic calming and/or pavement stenciling. The level of treatment to be provided for a specific location or corridor depends on several factors.

D11-1 Sign

Summary of Standards

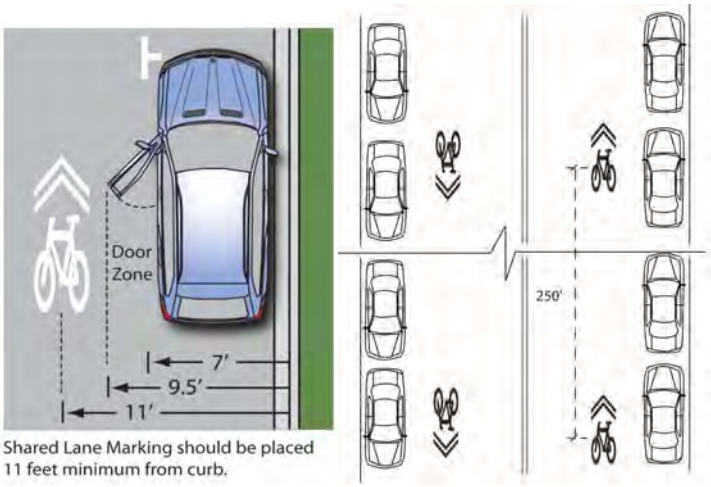
- Class III bikeways provide routes through areas not served by Class I or II facilities or provide connections between discontinuous segments of Class I or II bikeways.
- Class III facilities can be shared with either motorists on roadways or pedestrians on a sidewalk (not advisable).
- Bicycle routes on local streets should have vehicle traffic volumes under 1,000 vehicles per day. Traffic calming may be appropriate on streets that exceed this limit.
- Bicycle routes may be placed on streets with outside lane width of less than 15 feet if the vehicle speeds and volumes are low.
- Bicycle route signage standards:
  - The D11-1 (CA) bicycle route sign shall be placed along the roadways at decision points, where users can turn onto or off the bikeway.
  - Standard signage is shown in Chapter 9 of the 2012 California MUTCD.

Additional Considerations

Bicycle routes on roadway shoulders that share use with slow moving agricultural equipment should be constructed with three-inch asphalt concrete over six inches of aggregate base rock.

Shared Lane Markings

The primary purpose of this shared use arrow is to provide positional guidance to bicyclists on roadways that are too narrow to be striped with bicycle lanes. Markings may be placed on the street to inform motorists about the presence of cyclists and also to inform cyclists how to position themselves relative to parked cars and the travel lane. The 2012 California MUTCD has approved the Shared Lane Marking for use in California jurisdictions on streets with or without on-street parallel parking.



Potential Applications

- Bicycle network streets that are too narrow for standard striped bicycle lanes yet have posted speed limits under 35mph.
- Bicycle network streets that have moderate to high parking turnover.
- Areas that experience a high level of "wrong-way" riding.

Guidelines

- Where on-street parallel parking is present, shared lane markings should be placed a minimum of 11 feet from the curb to guide bicyclists to ride outside the “door zone”
- Shared lane markings should be installed in conjunction with “share the road” signs.
- Shared lane markings should be spaced approximately 250 feet center to center, with the first arrow on each block or roadway segment placed no further than 100 feet from the nearest intersection.

Class IV Protected Bikeway Design Guidance

Design Information Bulletin (DIB) 89, approved on December 31, 2015, established design guidance for a fourth bikeway type in California: Class IV separated or protected bikeways. Class IV bikeways are on-street facilities that are separated from moving vehicles by some kind of physical barrier, such as flexible bollards, concrete curbs or planters, or on-street parking. They may provide for either one-way or two-way bicycle travel.

Protected bikeways may offer a greater sense of comfort and usability, and have the potential to increase the number of bicyclists on the roadways. They may be good candidates for roadways where high vehicle speeds and/or volumes contribute to bicyclist discomfort, or when retrofitting existing streets where limited funds exist for relocating curbs and drainage.

This treatment is complex and has a number of variables. For specifics, please see:

http://www.dot.ca.gov/hq/oppd/dib/dib89.pdf

Summary of Design Guidance

- Protected bikeways shall include at least one of the following types of separation to discourage intrusion of motor vehicles: grade separation, flexible posts, inflexible physical barriers (such as railings or planters, generally used in 35 mph or less environments), on-street parking, or raised islands.
- Different buffer widths are suggested for each type of separation:
  - Grade separation: 1.5 feet to 3 feet
  - Flexible posts: 2 feet minimum, 3 feet desired
  - Inflexible physical barrier: 2 feet minimum, 3 feet desired
  - On-street parking: 3 feet minimum buffer between parking and bikeway, 5 feet minimum for accessible parking
  - Raised island: 2 feet minimum without parking, 3 feet desired; 1 foot if used with flexible posts; 3 feet with parking
- Separated bikeways should have a minimum clear width of 5 feet for one-way travel, with 7 feet desired. For two-way travel, the same width standards as a Class I bikeway apply.
  - 4 feet may be allowable at accessible parking or bus stop locations.

Additional Considerations

- Two-way protected bikeways are usually used in lower speed environments, 35 mph or less.
  - Yellow longitudinal markings are required between the directions of travel to denote two-way travel.
- On one-way streets, separated bikeways are usually provided on the left side of vehicular traffic to avoid conflicts with transit vehicle operations unless a design accounts for these conflicts on the right side of vehicular traffic or there is no transit on the route.
- Where there is on-street parking, the protected bikeway is typically between the parking and the sidewalk.
- As necessary, vehicles may need to cross the bikeway to access driveways or alleys, and pedestrians may need to cross the bikeway to access on-street parking or transit facilities.
- Green pavement markings may be used at intersections, driveways, or other potential conflict points.

On-Street Bikeway Regulatory & Warning Signage

Signage for on-street bikeways includes standard BIKE LANE and BIKE ROUTE signage, as well as supplemental signage such as SHARE THE ROAD and warning signage for constrained bike lane conditions. The CA MUTCD provides further guidance on bikeway signage.

Potential Applications

- Various situations, specific to each site.
- The City should install SHARE THE ROAD signs along all Class III Bike Routes in addition to standard BIKE ROUTE signage.
- SHARE THE ROAD signs may be installed at one-half mile intervals along the designated route.

Guidelines

- Signage should be installed on existing signposts if possible, reducing visual clutter.
- Bike route and bike lane signs should be placed at decision points.
- Where there is significant distance between decision points, bike route and bike lane signs should be repeated at regular intervals to confirm the route.

Wayfinding Signage

Wayfinding signage acts as a "map on the street" for bicyclists and is an important component of a bikeway network. Caltrans D11-1 and D-1 signage should be used on all designated bikeways at decision points, where users can turn onto or off the bikeway such as at an intersection.

Guidelines

- Wayfinding signage should be place at all intersections on the bikeway network, at minimum.
- Signs should be installed on existing signposts if possible, reducing visual clutter.
- Where there is significant distance between decision points, confirmation signs should be located at intervals of one-mile.
- Each sign should have a maximum of three destinations.
- Signage should be focused on major destinations such as cities and counties; transit stations; and community centers such as parks, schools and recreation centers.

Example Decision Wayfinding Sign

Example Confirmation Wayfinding Sign

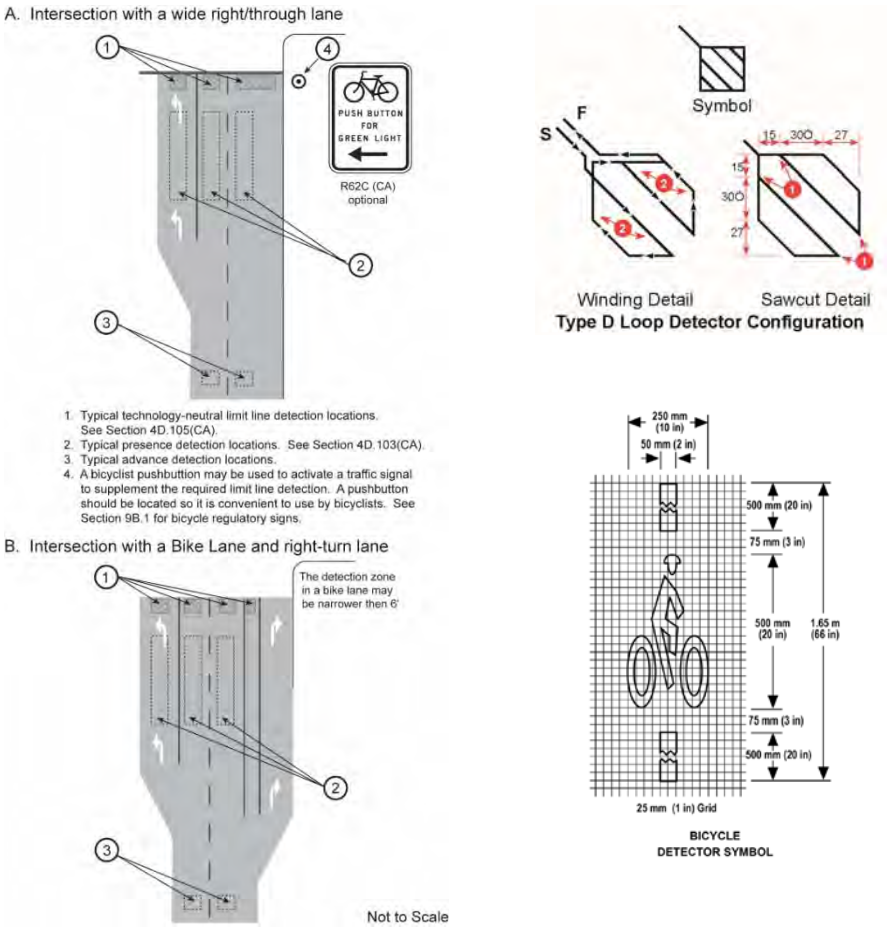
Bicycle Detection at Actuated Traffic Signals

Traffic Operations Policy Directive 09-06, issued August 27, 2009 by Caltrans modified CA MUTCD 4D.105 to require bicyclists to be detected at all traffic-actuated signals on public and private roads and driveways. If more than 50 percent of the limit line detectors need to be replaced at a signalized intersection, then the entire intersection should be upgraded so that every line has a limit line detection zone. Bicycle detection must be confirmed when a new detection system has been installed or when the detection system has been modified.

The California Policy Directive does not state which type of bicycle detection technology should be used. Two common types of detection are video and in pavement loop detectors. Push buttons may not be used as a sole method of bicycle detection.

Guidelines

- Type A, C, or D loop detectors should be used.
- Pavement markings should identify proper cyclist position above the loop detector.
- Loop detectors should provide adequate time for cyclists to cross the intersection, keeping in mind the slower travel speed (10-15 mph) of bicyclists.
- Bicycles must be detected with 95% accuracy within the 6-foot by 6-foot Limit Line Detection Zone.
- Where Limit Line Detection Zones are provided, minimum bicycle timing should be 14.7 feet per second, plus a 6-second start-up time.



Source: Traffic Operations Policy Directive 09-06

Bicycle Parking

Secure bicycle parking is an essential element of a functional bicycle network. Bicycle racks are a common form of short-term secure bicycle parking and can be installed in various locations, including sites adjacent to retail such as parking lots, as well as in the public right of way in the furnishings zone of the sidewalk. Racks are appropriate for locations where there is demand for short-term bicycle storage. Bicycle lockers provide secure and sheltered bicycle parking and are recommended in locations where long-term bicycle storage is needed, such as transit stations.

Potential Applications

- Bicycle parking should be installed throughout Live Oak, with priority given to significant destinations such as parks, schools, shopping centers, and job centers.

U-Rack *Post and Loop* *Horseshoe* *Wheelwell Secure*

Recommended types of bicycle parking

Guidelines

- Bicycle parking should be a design that is intuitive and easy to use.
- Bicycle parking should be securely anchored to a surface or structure.
- Bicycle parking spaces should be at least six feet long and two-and-a-half feet wide. Overhead clearance should be at least seven feet.
- The rack element (part of the rack that supports the bicycle) should keep the bicycle upright by supporting the frame in two places. The rack should allow one or both wheels to be secured.
- A standard U-Rack is a simple and functional design that takes up minimal space on sidewalks and is easily understood by users. Avoid use of multiple-capacity "wave" style racks. Users commonly misunderstand how to correctly park at wave racks, placing their bikes parallel to the rack and limiting capacity to one or two bikes.
- Position racks so there is enough room between parked bicycles. If it becomes too difficult for a bicyclist to easily lock their bicycle, they may park it elsewhere. Racks should be situated on 36-inch minimum centers.
- A five-foot aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle parking.
- Empty racks should not pose a tripping hazard for visually impaired pedestrians. Position racks out of the walkway's clear zone.
- Racks should be located close to a main building entrance, in a lighted, high-visibility, covered area protected from the elements. Long-term parking should always be protected.

Additional Considerations

All bicycle parking should be in a safe, secure area visible to passersby. Commuter locations should provide secure indoor parking, covered bicycle corrals, or bicycle lockers. Short term bicycle parking facilities, such as bicycle racks, are best used to accommodate visitors, customers, messengers and others expected to depart within two hours. They are usually located at schools, commercial locations, and activity centers such as parks, libraries, retail locations, and civic centers. Bicycle parking on sidewalks in commercial areas should be provided according to specific design criteria, reviewed by merchants and the public, and installed as demand warrants. The following table provides recommended guidelines for bicycle parking locations and quantities.

Recommended Guidelines for Bicycle Parking Location and Quantities

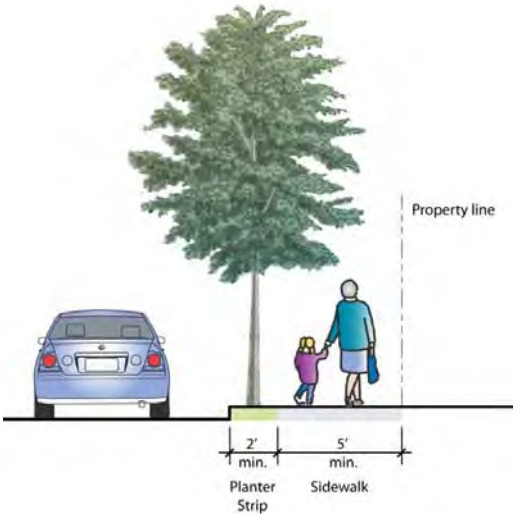
Land Use or Location	Physical Location	Quantity
Parks	Adjacent to restrooms, picnic areas, fields, and other attractions	8 bicycle parking spaces per acre
Schools	Near office and main entrance with good visibility	8 bicycle parking spaces per 40 students
Public Facilities (libraries, community centers)	Near main entrance with good visibility	8 bicycle parking spaces per location
Commercial, retail and industrial developments over 10,000 square feet	Near main entrance with good visibility	1 bicycle parking space per 15 employees or 8 bicycles per 10,000 square feet
Shopping Centers over 10,000 square feet	Near main entrance with good visibility	8 bicycle parking spaces per 10,000 square feet
Transit Stations	Near platform, security or ticket booth	1 bicycle parking space or locker per 30 automobile parking spaces
Multi-Family Residential	Near main entrance with good visibility	1 short-term bicycle parking space per 10 residential units AND 1 long-term bicycle parking space per 2 residential units

Sidewalk Widths

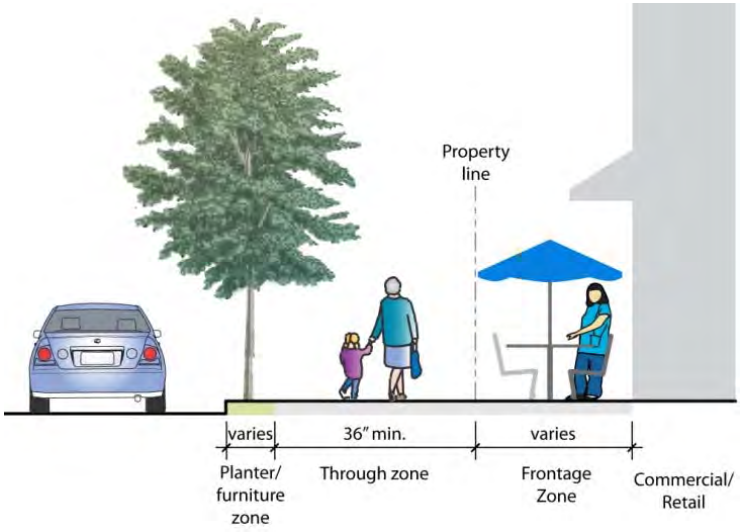
Pedestrian zones located in areas with commercial or retail activity provide excellent opportunities to develop an inviting pedestrian environment. The frontage zone in retail and commercial areas may feature seating for cafés and restaurants, or extensions of other retail establishments, like florists shops. The furnishings zone may feature seating, as well as newspaper racks, water fountains, utility boxes, lampposts, street trees and other landscaping. The medium to high-density pedestrian zone should provide an interesting and inviting environment for walking as well as window shopping.

Design Summary

Walkway width recommendations in current transportation industry guidelines generally exceed the 36-inch minimum needed for accessible travel under the Americans with Disabilities Act. The Institute of Transportation Engineers (ITE), in its 1998 recommended practice publication, "Design and Safety of Pedestrian Facilities," recommends planning sidewalks that are a minimum of 5 feet wide with a planting strip of 2 feet on local streets and in residential and commercial areas.



Typical Residential Sidewalk



Typical Commercial Area Sidewalk

Sidewalk Grade and Cross Slope

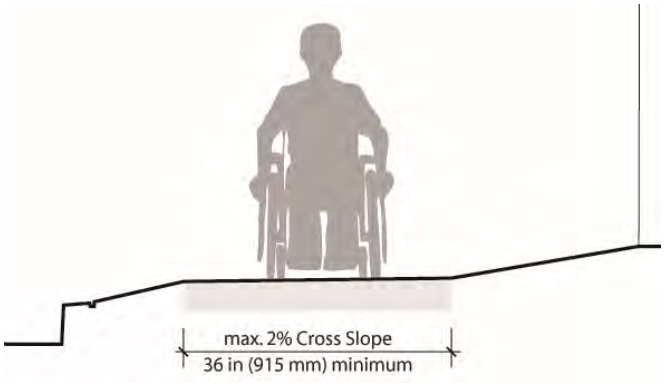
The grade of a sidewalk affects the issues of control, stability and endurance. Gentle grades are preferred to steep grades, allowing more people to go uphill, providing more control on the downhill, and minimizing loss of footing. The maximum grade of a sidewalk should be no more than 14 percent in any 2-foot section, while the running grade for a sidewalk should not exceed 5 percent.

Grade
The following terms apply to standards for grades:

- Grade is the slope parallel to the direction of travel.
- Running grade is the average grade along an entire continuous path.
- Maximum grade covers a section of the sidewalk that is larger than the running grade. It is measured over a two-foot section.
- Rate of change is the change of the grade over a distance of two feet.
- Counter slope is the grade running opposite to the running grade.

Cross Slope

- Cross-slope describes the angle of the sidewalk from the building line to the street, perpendicular to the direction of travel. All sidewalks require some cross-slope for drainage, but a cross-slope that is too great will present problems for people who use wheelchairs, walking aids, or who have difficulty walking but do not use aids. The maximum cross-slope should be no more than 2 percent (1:50) for compliance with ADA.
- If a greater slope is anticipated because of unusual topographic or existing conditions, the designer should maintain the preferred slope of 1:50 within the entire Through Passage Zone, if possible. This can be accomplished either by raising the curb so that the cross-slope of the entire sidewalk can be 1:50, or by placing the more steeply angled slope within the Furnishings Zone and/or the Frontage Zone.
- If the above measures are not sufficient and additional slope is required to match grades, the cross slope within the Through Passage Zone may be as much as 1:25, provided that a 3-ft wide portion within the Through Passage Zone remains at 1:50 cross slope.



Sidewalk cross slope should not exceed 2% to comply with ADA accessibility standards.

Sidewalk Materials

Sidewalks should be firm and stable, and resistant to slipping. Sidewalks are normally constructed out of Portland cement concrete. Although multi-use pathways may be constructed out of asphalt, asphalt is not suitable for sidewalk construction due to its shorter lifespan and higher maintenance costs.

Concrete is the most common surface for sidewalks; however, some sidewalks are designed using decorative materials, such as brick or cobblestone. Although these surfaces may improve the aesthetic quality of the sidewalk, they may also present challenges to people with mobility impairments. For example, tiles that are not spaced tightly together can create grooves that catch wheelchair casters.

Design Summary
Concrete:

- Preferred material for use on standard sidewalks.
- Maintenance life: 75 years plus (with no tree root damage).

Concrete Pavers:

- Acceptable material for use where aesthetic treatment is desired. May be best suited for the Furnishings Zone as streetscape accent where pedestrian through travel is not expected. Not recommended for use on sidewalk through-zone.
- Maintenance life: 20 years plus.

Concrete Sidewalk

Concrete Pavers

Sidewalk Furnishings

The furnishings zone is the area between the curb zone and the through passage zone, where pedestrians pass. The furnishings zone creates an important buffer between pedestrians and vehicle travel lanes by providing horizontal separation.

Design Summary
Width:

- A minimum width of 24 in (48 in if planting trees) is recommended (FHWA).
- On sidewalks of ten feet or greater, the furnishings zone width should be a minimum of four feet.
- A wider zone should be provided in areas with large planters and/or seating areas.

Transit Stop/Shelter Placement:

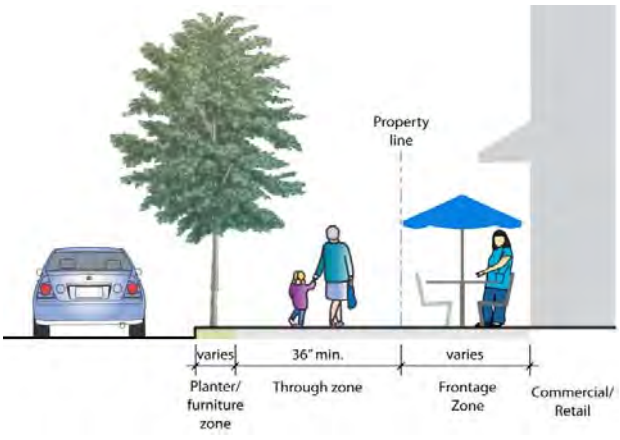
- To discourage midblock crossings by pedestrians, bus stops at or near intersections are generally preferred to midblock crossings.
- An 8 foot by 5 foot landing pad must be provided. A continuous 8 foot pad or sidewalk the length of the bus stop, or at least from the front to rear bus doors, is recommended.
- At stops in areas without curbs, an 8 foot shoulder should be provided as a landing pad.
- Bus shelters should be provided where possible to provide visible, comfortable seating and waiting areas for pedestrians. Bus shelters must have a clear floor area of 2.5 feet by 4 feet, entirely within the perimeter of the shelter, connected by a pedestrian access route to the boarding area (AASHTO).

Street Trees and Plantings:

- Wherever the sidewalk is wide enough, the furnishings zone should include street trees. In order to maintain line of sight to stop signs or other traffic control devices at intersections, when planning for new trees, care should be taken not to plant street trees within 25 feet of corners of any intersection.

Street Furniture and Amenities:

- Street furniture should be placed in the furnishings zone to maintain through passage zones for pedestrians and to provide a buffer between the sidewalk and the street.



Recommended Design

Design Example

Curb Ramps

Curb ramps are necessary for people who use wheelchairs to access sidewalks and crosswalks. ADA requires the installation of curb ramps in new sidewalks, as well as retrofitting existing sidewalks. Curb ramps may be placed at each end of the crosswalk (perpendicular curb ramps), or between crosswalks (diagonal curb ramps). The ramp may be formed by drawing the sidewalk down to meet the street level, or alternately building up a ramp to meet the sidewalk.

Design Summary
Orientation and Alignment:

- Perpendicular curb ramps should be used at large intersections.
- Curb ramps should be aligned with crosswalks, unless they are installed in a retrofitting effort and are located in an area with low vehicular traffic.

Width:

- The minimum width of a curb ramp should be 36 inches, in accordance with ADAAG Guidelines.
- Curb ramps should be designed to accommodate the level of use anticipated at specific locations, with sufficient width for the expected level of peak hour pedestrian volumes and other potential users.

Drainage:

- Adequate drainage should be provided to prevent flooding of curb ramps.

Detectable Warnings:

- Tactile strips must be used to assist sight-impaired pedestrians in locating the curb ramp. Certain exemptions apply (see ADAAG Section 4.29 and the ADA Access Board Guidelines on Accessible Public Rights of Way).
- Detectable warnings shall consist of raised truncated domes with a diameter of nominal 0.9 inches, a height of nominal 0.2 inches and a center-to-center spacing of nominal 2.35 inches and shall contrast visually with adjoining surfaces, either light-on-dark, or dark-on-light (ADAAG).

Perpendicular Curb Ramps *Parallel Curb Ramp* *Diagonal Curb Ramp*

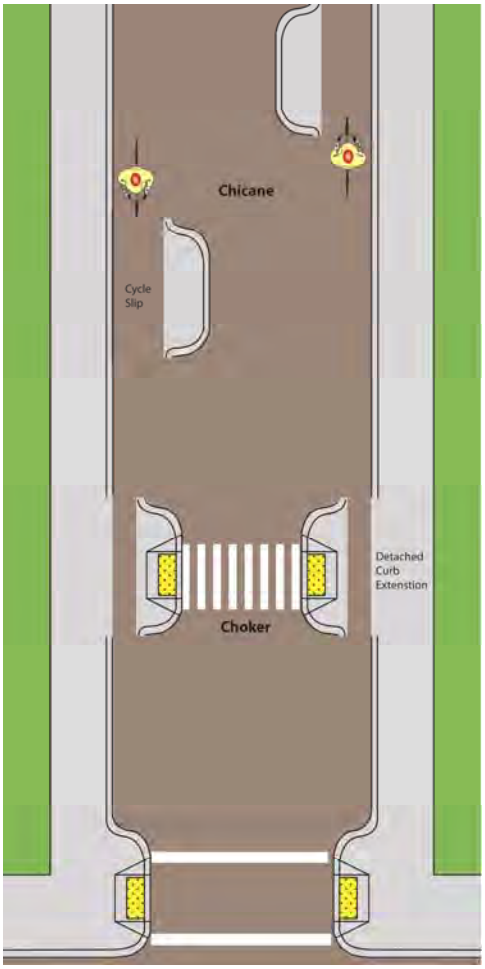
Curb Extensions

Curb extensions are a traffic calming device used to narrow roadway widths and shorten pedestrian crossing distances. Curb extensions may be installed on one or both sides of the roadway. Curb extensions installed at alternating frequencies on both sides of a roadway creates a “chicane” or S curve. Curb extensions installed on both sides of a roadway in the same location creates a “choker” or extra narrow roadway section.

Curb extension design should facilitate roadway drainage. Such designs may include detaching the curb extension from the curb. Detaching curb extensions provides the opportunity for “cycle” slips, which allow bicyclists to travel straight through the curb extension. Conversely, the channel of the detached curb extension may be covered with a grate to bridge the curb extension and sidewalk, allowing water to drain along the gutter.

Design Summary

- Emergency vehicle operators should be consulted to ensure curb extensions do not negatively affect emergency response times.
- Mid-block installation with where pedestrians cross should consider raised crosswalks.
- Detaching curb extensions facilitates drainage and provides the opportunity for cycle slips.
- Installed at alternating frequencies on both sides of a roadway prevents motorists from “straight line racing”, especially if curbs are extended into one full travel lane.
- Installed in a series of three effectively slows motorists.



Curb extensions can be used in a variety of locations to calm traffic speeds.

Crosswalks

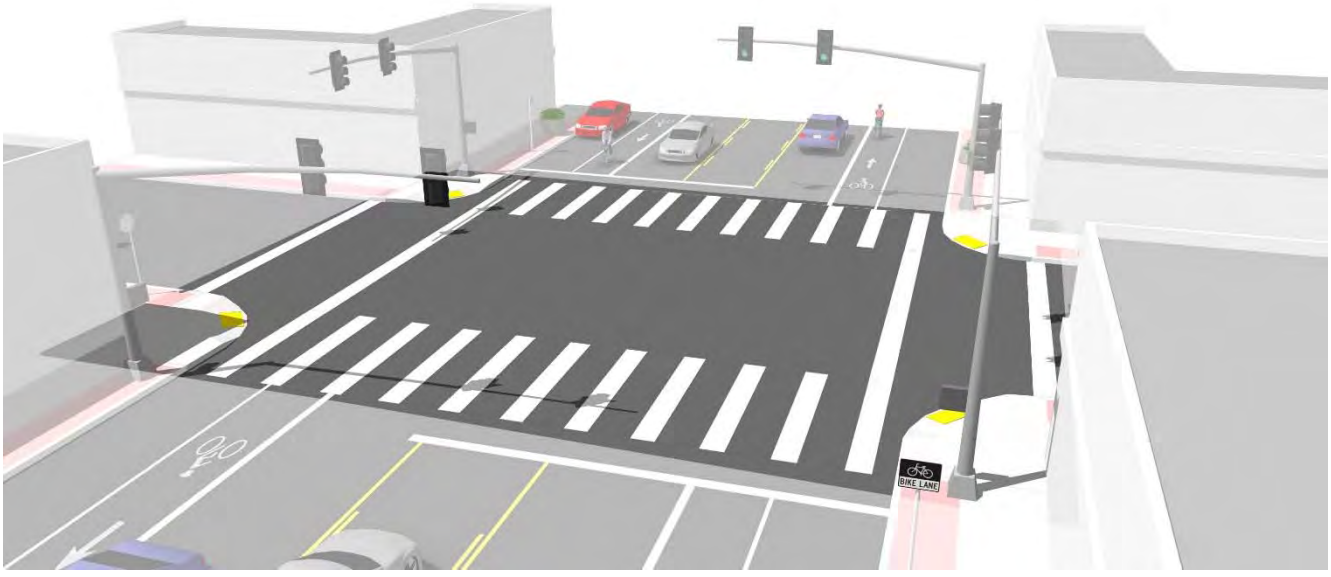
Crosswalks should be used:

- At signalized intersections, all crosswalks should be marked.
- At unsignalized intersections, crosswalks should be marked when they:
  - help orient pedestrians in finding their way across a complex intersection, or
  - help show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts, or
  - help position pedestrians where they can best be seen by oncoming traffic.
- At mid-block locations, crosswalks are marked where:
  - there is a demand for crossing, and
  - there are no nearby marked crosswalks.

Advance yield lines should be considered at crosswalks where additional space between crosswalks and stopped motorists is desired. Advance yield lines should not place motorists in a position where sight lines are obstructed.

Design Summary
Ladder or piano key crosswalk markings are recommended for high-volume crosswalks including school crossings, across arterial streets for pedestrian-only signals, at mid-block crosswalks, and where the crosswalk crosses a street not controlled by a signal or stop signs.

- Continental crosswalk markings consist of two foot wide bars spaced 2 ft apart and should be located such that the wheels of vehicles pass between the white stripes.
- Transverse crosswalk markings consist of one foot wide parallel bars spaced not less than 6 ft apart.
- Ladder crosswalk markings combine continental markings with transverse stripes, consisting of two foot wide bars spaced 2 feet apart between one foot wide parallel stripes that are 10 ft apart.
- Advance yield lines, if used, should be installed at least six feet in advance of crosswalks.
- In California, school zone crossings can be painted yellow in color.



Continental and Transverse crosswalk markings

Crosswalks at Mid-Block and Uncontrolled Crossings

The table on the following page is a summary for implementing at-grade roadway crossings. The number one (1) indicates a ladder style crosswalk with appropriate signage is warranted. (1/1+) indicates the crossing warrants enhanced treatments such as flashing beacons, or in-pavement flashers. (1+/3) indicates Pedestrian Light Control Activated (Pelican), Puffin signal, or Hybrid Beacon (HAWK) should be considered.

Design Summary
Placement:

- Mid-block crosswalks should be installed where there is a significant demand for crossing and no nearby existing crosswalks.

Yield Lines:

- If yield lines are used for vehicles, they shall be placed 20 to 50 feet in advance of the nearest crosswalk line to indicate the point at which the yield is intended or required to be made and 'Yield Here to Pedestrians' signs shall be placed adjacent to the yield line.
- Where traffic is not heavy, stop or yield signs for pedestrians and bicyclists may suffice.

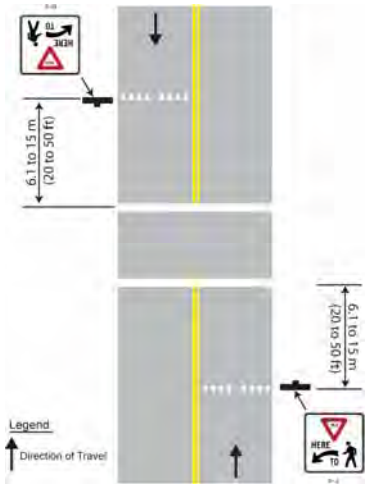
Warning Signs:

- The Pedestrian Warning (R1-5) sign alerts the road user to unexpected entries into the roadway by bicyclists, and other crossing activities that might cause conflicts.

Pavement Markings:

- High visibility crosswalk markings should be used (continental or ladder style).
- Warning markings on the path and roadway should be installed.

See table on the following page to determine if additional treatments such as raised median refuges or flashing beacons should be used.



Source: California MUTCD, Figure 3B-15

R1-5

Yield Here to Pedestrian Sign

Roadway Type (Number of Travel Lanes and Median Type)	Vehicle ADT ≤ 9,000			Vehicle ADT > 9,000 to 12,000			Vehicle ADT > 12,000 to 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	1	1	1/1+	1	1	1/1+	1	1	1+/3	1	1/1+	1+/3
3 Lanes	1	1	1/1+	1	1/1+	1/1+	1/1+	1/1+	1+/3	1/1+	1+/3	1+/3
Multi-Lane (4 or more lanes) with raised median***	1	1	1/1+	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3
Multi-Lane (4 or more lanes) without raised median	1	1/1+	1+/3	1/1+	1/1+	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3	1+/3

*General Notes: Crosswalks should not be installed at locations that could present an increased 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 recomendations; good engineering judgment should be used in individual cases for deciding which treatment to use.

For each trail-roadway crossing, an engineering study is needed to determine the proper location. For each 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.

**Where the speed limit exceeds 40 mi/h (64.4 km/h), marked crosswalks alone should not be used at unsignalized locations.

***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 AASHTO guidelines. A two-way center turn lane is not considered a median.

1= Type 1 Crossings. Ladder-style crosswalks with appropriate signage should be used.

1/1+ = With the higher volumes and speeds, enhanced treatments should be used, including marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

1+/3 = Carefully analyze signal warrants using a combination of Warrant 2 or 5 (depending on school presence) and EAU factoring. Make sure to project usage based on future potential demand. Consider Pelican, Puffin, or Hawk signals in lieu of full signals. For those intersections not meeting warrants or where engineering judgment or cost recommends against signalization, implement Type 1 enhanced crosswalk markings with marked ladder style crosswalks, median refuge, flashing beacons, and/or in-pavement flashers. Ensure there are sufficient gaps through signal timing, as well as sight distance.

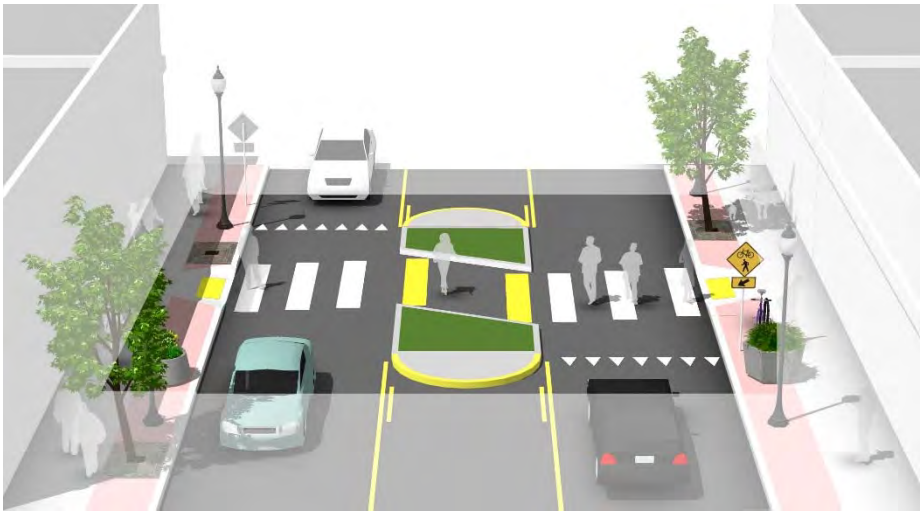
Pedestrian Refuge Islands

Pedestrian refuge islands provide additional protection for pedestrians crossing at intersections. They can also prevent vehicles from encroaching into the refuge area when making left turns. Pedestrian refuge islands may not be feasible to install due potential to turning movement restrictions.

Design Summary
Pedestrian refuge islands should be placed at wide multi-lane roadways. Depending on the signal timing, median islands should be considered when the crossing distance exceeds 60 feet, but can be used at intersections with shorter crossing distances where a need has been recognized.

ADA Access Board Guidelines on Accessible Public Rights of Way has a section on median islands. The following guidelines are applicable:

- Medians and pedestrian refuge islands in crosswalks shall contain a pedestrian access route, including passing space connecting to each crosswalk.
- Medians and pedestrian refuge islands shall be 6.0 ft minimum in length in the direction of pedestrian travel.
- Ramped up and cut-through refuge islands should be permitted. Factors to consider include slope, drainage and width of the island. Median curb ramps can add difficulty to crossing for some users.
- Medians and refuge islands should have detectable warnings, with detectable warnings at cut-through islands separated by a 2-foot minimum length of walkway without detectable warnings.



Pedestrian Refuge Island

Pedestrian-Related Signage

Caltrans categorizes signs into warning and regulatory. Pedestrian warning signs should be fluorescent yellow green to call the attention from motorists. Pedestrian regulatory signs govern pedestrian and motorist movements, such as "Yield Here to Pedestrians." The signs below provide examples of regulatory and warning signs.

Design Summary

- Pedestrian warning signs should accompany all non-controlled crosswalks.
- Yield Here to Pedestrians signs should be installed at yield lines or "teeth."
- In-street Yield to Pedestrian signs should be considered at non-controlled crosswalks where motorists frequently violate pedestrian right of way.

In-Street Yield to Pedestrian Sign

Pedestrian Crossing Warning

School Area Signs

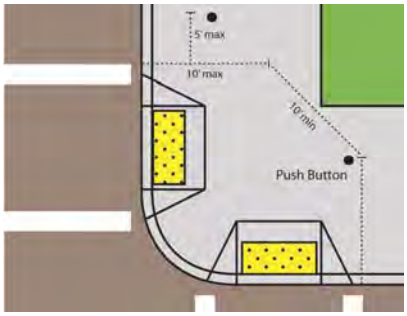
Guidelines for Signalized Pedestrian Crossings

Pedestrian pushbuttons should be used at any signalized intersection without a dedicated pedestrian phase. Push buttons allow pedestrians to actuate a walk phase. All new and modified traffic signals should include accessible pushbuttons that are large and vibrate during a walk phase for visually impaired pedestrians.

Design Summary

- CA MUTCD requires a walk signal phase to accommodate a 4 feet per second (f/s) pace or slower.
- CA MUTCD provides the option of a walk signal phase to accommodate a 2.8 f/s pace.
- Push buttons should be located within five feet of the transverse crosswalk line extended.
- Push button location should be adjacent to an all-weather surface to facilitate accessibility.
- Push buttons should be installed within 10 feet of the curb unless impractical.

Pedestrian Push Button



Push button placement

Crossing Beacons

Beacons enhance uncontrolled crosswalks by using devices that call attention to pedestrians. Beacons may be actuated by pedestrians wishing to cross at a crosswalk or may flash on a continuous basis to warn motorists of potential pedestrian activity ahead.

The standard beacon uses a yellow round light that flashes at regular intervals. Over time, motorists have become complacent with this type of beacon, resulting in a lower yielding compliance. New beacon designs incorporate high-visibility elements to increase compliance. The 2012 California MUTCD approved hybrid beacons for use in California.

- Pedestrian hybrid beacons utilize yellow warning and red stop lights similar to a traffic signal. After pedestrian actuation, the yellow light will flash and then turn solid to warn motorists to slow for a cued pedestrian. A red light follows to stop motorists the yellow and flashes red after the pedestrian crossing phase expires.
- Rectangular Rapid Flash beacons (RRFBs) utilize a LED light that flashes in a stutter pattern similar to that of an emergency vehicle.

Design Summary

- Application must be at least 100 feet from an intersection.
- Does not need to meet signal warrant; however consideration should be made based on an engineering study that considers vehicle volumes, widths, and gaps in conjunction with pedestrian volumes, walking speeds, and delay.
- Crosswalk warning beacons should be actuated to maximize yield to pedestrian compliance.

See the CA MUTCD Section 4F.01 for more information.

Pedestrian Hybrid Beacon

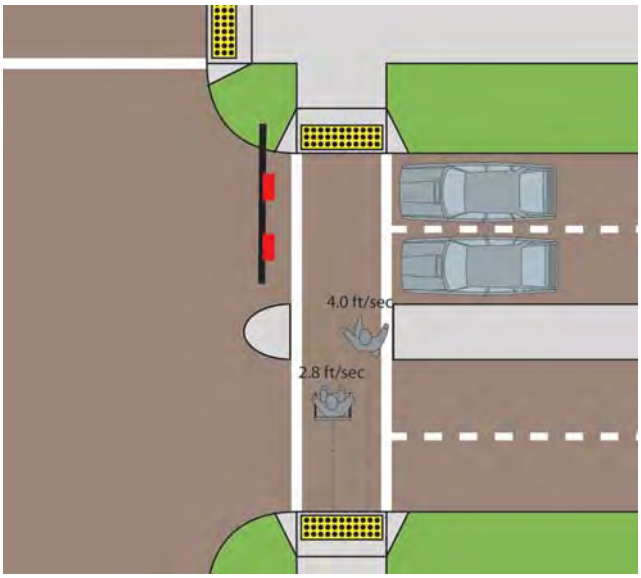
Pedestrian Friendly Signal Timing

Pedestrian speed determines the duration of a pedestrian phase. CA MUTCD standard pedestrian speed for calculating pedestrian phasing is 3.5-4.0 feet per second. This speed does not accommodate slow moving pedestrians such as children, seniors and people with disabilities. CA MUTCD provides the option of using 2.8 feet per second as a pedestrian speed to accommodate slow moving pedestrians.

Countdown pedestrian heads display the remaining time of a pedestrian phase, informing crossing pedestrians. Countdown heads are most applicable at multi-lane arterial roadways where pedestrians have a long distance to cross. If a median is provided, pedestrians may rest and wait for the next pedestrian phase to cross the remaining roadway.

Design Summary

- A pedestrian speed of 2.8 feet per second should be considered at locations used by slow moving pedestrians, i.e. children, seniors and people with disabilities.
- Countdown heads should be installed at multi-lane arterial roadway intersections.
- Countdown heads should incorporate audible instructions.



Pedestrian timing should be derived from 2.8 feet per second pedestrian speed in areas with children, seniors and people with disabilities.

Countdown Signal

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Appendix C. Project List

This appendix presents a complete list of recommended infrastructure projects, including project evaluation results and planning level cost estimates. Projects are presented in alphabetical order by location.

For more information about project evaluation criteria or unit cost assumptions, see **Chapter 7**.

Table C-1: Project List

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Class II Bike Lanes	Allen St	N St	Linda St			0	0	0	0	15	**15**	3	$5,000		0.11
Sidewalk	Apricot St	116 ft W of P St	150 ft W of Q St	N		0	0	0	0	0	**0**	3	$100,800	593	
Class II Bike Lanes	Apricot St	Broadway	Samuel St		Existing curb extensions at trail crossing	0	0	0	0	15	**15**	3	$21,700		0.49
Sidewalk	Archer Ave	111 ft W of K St	187 ft W of K St	S		0	0	0	0	0	**0**	3	$12,900	76	
Sidewalk	Archer Ave	407 ft E of K St	357 ft E of K St	S		0	0	0	0	0	**0**	3	$8,500	50	
Sidewalk	Archer Ave	469 ft E of K St	77 ft E of K St	N		0	25	0	0	0	**25**	3	$66,600	392	
Sidewalk	Archer Ave	574 ft E of K St	497 ft E of K St	S		0	0	0	0	0	**0**	3	$13,200	77	
Sidewalk	Archer Ave	91 ft E of L St	L St	S		0	0	0	15	0	**15**	3	$15,500	91	
Sidewalk	Archer Ave	K St	L St	N		0	0	0	15	0	**15**	3	$115,900	682	
Sidewalk	Ash St	107 ft E of K St	L St	N		0	0	0	0	0	**0**	3	$74,400	438	
Sidewalk	Ash St	117 ft E of K St	68 ft E of L St	S		0	0	0	0	0	**0**	3	$65,900	387	
Sidewalk	Ash St	L St	Hwy 99	N		0	0	0	15	0	**15**	3	$63,500	373	
Sidewalk	Birch St	E end of Birch St	L St	N		0	0	0	0	0	**0**	3	$74,400	438	
Sidewalk	Birch St	E end of Birch St	L St	S		0	0	0	0	0	**0**	3	$75,800	446	
Sidewalk	Birch St	L St	Hwy 99	N		0	0	0	15	0	**15**	3	$79,200	466	
Sidewalk	Birch St	L St	Hwy 99	S		0	0	0	15	0	**15**	3	$77,600	457	
Sidewalk	Broadway	150 ft N of Center Way	Center Way	W		0	25	0	15	0	**40**	2	$25,600	151	
Widen Sidewalk	Broadway	67 ft S of Pennington Rd	Elm St	W	Widen Sidewalk	0	25	20	15	15	**75**	1	$175,000	916	
Study: Control Warrant	Broadway	Apricot St		all	Stop warrant, with crosswalks on 3 legs	0	25	0	0	15	**40**	2	$10,000		
Sidewalk	Broadway	Elm St	Apricot St	E		0	25	20	15	0	**60**	1	$219,400	1,291	

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Sign Relocation	Broadway	Elm St		W	Relocate "Cross Traffic Does Not Stop" sign to existing Stop signpost; remove second post	0	0	20	15	15	**50**	2	$1,200		
Study: Intersection Improvement	Broadway	Elm St		W	Intersection: Improvement to address pedestrian crossing and vehicle queuing	0	0	20	15	15	**50**	2	$20,000		
Crosswalk	Broadway	Fir St		N, S	Uncontrolled crossing - connection to linear park along RR, connection from parking to retail.	0	25	20	0	15	**60**	1	$3,000		
Crosswalk	Broadway	Gum St		N, S	Uncontrolled crossing - connection to linear park along RR, connection from parking to retail.	0	25	20	0	15	**60**	1	$3,000		
Sidewalk	Broadway	Pennington Rd	Elm St	E		0	25	20	15	0	**60**	1	$164,000	964	
Study: Street Closure	California St	Gum St	N St fork		Close California St between Gum St and fork of N Street; create neighborhood park	0	25	0	15	0	**40**	2	$20,000		0.02
Class I Shared Use Path	California St	N St	Elm St		Live Oak Community Trail 2	0	25	20	15	0	**60**	1	$103,900		0.18
Sidewalk	California St	N St	Fir St	W		0	25	0	15	0	**40**	2	$76,700	451	
Sidewalk	California St	Pennington Rd	Elm St	E		0	25	0	15	0	**40**	2	$178,300	1,049	

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Class III Bike Route	Connecticut Ave	Jasmine Dr	Pennington Rd		With Shared Lane Marking	0	25	0	0	15	**40**	2	$1,300		0.08
Access Gate	Connecticut Ave	Jasmine Dr			School Site Coordination; provide gate to access bicycle parking	0	25	0	0	0	**25**	3	$4,000		
Sidewalk	Date St	70 ft W of P St	Q St	N		0	25	0	0	0	**25**	3	$51,100	301	
Sidewalk	Date St	82 ft W of P St	Q St	S		0	25	0	0	0	**25**	3	$36,900	217	
Sidewalk	Date St	E end of Date St	L St	N		0	0	0	15	0	**15**	3	$38,400	226	
Sidewalk	Date St	E end of Date St	L St	S		0	0	0	15	0	**15**	3	$39,000	229	
Sidewalk	Date St	L St	Larkin Rd	N		0	0	0	15	0	**15**	3	$80,200	472	
Sidewalk	Date St	L St	Larkin Rd	S		0	0	0	15	0	**15**	3	$74,900	440	
Sidewalk	Deree St	Pennington Rd	S end of Deree Ave	E		0	25	0	0	0	**25**	3	$373,200	2,195	
Sidewalk	Deree St	Pennington Rd	S end of Deree Ave	W		0	25	0	0	0	**25**	3	$382,600	2,251	
Sidewalk	Elm St	252 ft E of L St	L St	N		25	0	0	0	0	**25**	3	$42,900	253	
Sidewalk	Elm St	257 ft W of K St	301 ft W of K St	N		25	0	0	0	0	**25**	3	$7,400	44	
Sidewalk	Elm St	304 ft E of L St	L St	S		25	0	0	0	0	**25**	3	$51,700	304	
Sidewalk	Elm St	80 ft E of Larkin Rd	Larkin Rd	S		25	0	0	15	0	**40**	2	$13,700	80	
Sidewalk	Elm St	L St	107 ft W of L St	N		25	0	0	15	0	**40**	2	$18,200	107	
Sidewalk	Elm St	Larkin Rd	Hwy 99	S	Reconfigure parking (coordinate with property owner)	25	0	20	15	0	**60**	1	$16,000	94	
Sidewalk	Elm St	N St	O St	N		25	25	0	15	0	**65**	1	$48,500	285	
Sidewalk	Elm St	N St	O St	S		25	25	0	15	0	**65**	1	$48,900	288	
Sidewalk	Elm St	P St	W end of Elm St	N		25	25	0	0	0	**50**	2	$138,400	814	

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Sidewalk	Elm St	P St	W end of Elm St	S		25	25	0	0	0	**50**	2	$139,600	821	
Pedestrian Crossing	Elm St	Railroad			UPRR and CPUC Coordination	25	25	20	15	0	**85**	1	$20,000		
Class I Shared Use Path	Existing Footpath	Date St	Deree Rd			0	0	0	0	0	**0**	3	$30,000		0.05
Sidewalk	Fir St	191 ft E of Deree Ave	Deree Ave	N		0	0	0	0	0	**0**	3	$32,500	191	
Sidewalk	Fir St	191 ft E of Deree Ave	Deree Ave	S		0	0	0	0	0	**0**	3	$36,400	214	
Sidewalk	Fir St	201 ft E of Larkin Rd	39 ft E of Larkin Rd	S		0	25	0	15	0	**40**	2	$28,000	165	
Sidewalk	Fir St	California St	N St	N		0	0	0	15	0	**15**	3	$19,400	114	
Sidewalk	Fir St	L St	154 ft E of Larkin Rd	N		0	25	0	15	0	**40**	2	$52,400	309	
Sidewalk	Fir St	L St	49 ft W of L St	S		0	0	0	0	0	**0**	3	$8,300	49	
Sidewalk	Gum St	135 ft E of L St	L St	S		0	25	0	0	0	**25**	3	$23,000	135	
Sidewalk	Gum St	452 ft W of P St	W end of Gum St	S		0	25	0	0	0	**25**	3	$64,000	376	
Sidewalk	Gum St	DeVilbiss Way	O St	N		0	25	0	15	0	**40**	2	$27,500	162	
Sidewalk	Gum St	DeVilbiss Way	O St	S		0	25	0	15	0	**40**	2	$27,600	162	
Sidewalk	Gum St	L St	304 ft E of Larkin Rd	S		0	25	0	15	0	**40**	2	$51,600	304	
Sidewalk	Gum St	L St	Larkin Rd	N		0	25	0	15	0	**40**	2	$72,300	425	
Sidewalk	Gum St	N St	DeVilbiss Way	N		0	25	0	15	0	**40**	2	$26,300	154	
Sidewalk	Gum St	N St	DeVilbiss Way	S		0	25	0	15	0	**40**	2	$25,100	148	
Sidewalk	Gum St	O St	P St	N	Reconfigure parking (coordinate with property owner)	0	25	0	0	0	**25**	3	$46,300	272	
Sidewalk	Gum St	O St	P St	S		0	25	0	0	0	**25**	3	$50,700	298	
Sidewalk	Gum St	P St	382 ft W of P St	S		0	25	0	0	0	**25**	3	$65,000	382	

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Sidewalk	Gum St	P St	W end of Gum St	N		0	25	0	0	0	**25**	3	$136,800	805	
Hwy 99 Streetscape Master Plan Sidewalk	Hwy 99	Riviera Rd	Paseo Ave	E, W	Caltrans Coordination; 6 ft sidewalk w/ variable landscaped buffer or bioswale. Reconfigure some parking (coordinate with property owners).	25	25	20	15	0	**85**	1	$6,412,218	37,719	
Study: Traffic Calming	Hwy 99	Ash St			Gateway and Traffic Calming	25	25	0	0	15	**65**	1	$80,000		
Gateway Monument	Hwy 99	Nevada St		N	Gateway Monument sign	25	0	0	0	15	**40**	2	$1,000		
Sidewalk	Ivy St	Hwy 99	120ft W of Hwy 99	S		0	25	0	15	0	**40**	2	$20,500	120	
Sidewalk	Ivy St	Hwy 99	Railroad	N		0	25	0	15	0	**40**	2	$38,600	227	
Sidewalk	Ivy St	Larkin Rd	Hwy 99	N		0	25	0	15	0	**40**	2	$47,700	281	
Sidewalk	Ivy St	Larkin Rd	Hwy 99	S		0	25	0	15	0	**40**	2	$49,500	291	
Class III Bike Route	Jasmine Dr	Connecticut Ave	Luther Rd		End at Luther school parking lot	0	25	0	0	15	**40**	2	$2,800		0.31
Sidewalk	Kola St	59 ft E of Hwy 99	Hwy 99	N		0	0	0	15	0	**15**	3	$10,000	59	
Sidewalk	Kola St	Hwy 99	286 ft W of Hwy 99	N		0	0	0	15	0	**15**	3	$48,600	286	
Sidewalk	Kola St	Hwy 99	Railroad	S	Reconfigure parking (coordinate with property owner)	0	0	0	15	0	**15**	3	$79,100	466	
Sidewalk	Kola St	Larkin Rd	Hwy 99	S		0	25	0	15	0	**40**	2	$49,500	291	
Sidewalk	Kola St	N St	O St	N		0	25	0	0	0	**25**	3	$52,700	310	
Sidewalk	Kola St	N St	O St	S		0	25	0	0	0	**25**	3	$44,700	263	

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Class III Bike Route	Kola St	O St	Tulip St			0	0	0	0	15	**15**	3	$2,100		0.24
Pedestrian Crossing	Kola St	Railroad			UPRR and CPUC Coordination	0	25	0	15	0	**40**	2	$20,000		
Sidewalk	L St	Archer Ave	Birch St	W		25	0	0	15	0	**40**	2	$50,500	297	
Sidewalk	L St	Archer Ave	Birch St	E		25	0	0	15	0	**40**	2	$50,600	298	
Sidewalk	L St	Birch St	Ash St	E		25	0	0	0	0	**25**	3	$48,400	285	
Sidewalk	L St	BIrch St	Ash St	W		25	0	0	0	0	**25**	3	$47,900	282	
Sidewalk	L St	Date St	Archer Ave	E		25	0	0	15	0	**40**	2	$25,800	152	
Sidewalk	L St	Date St	Archer Ave	W		25	0	0	15	0	**40**	2	$24,800	146	
Sidewalk	L St	Elm St	Date St	E		25	0	0	15	0	**40**	2	$48,700	286	
Sidewalk	L St	Fir St	Elm St	W		25	0	0	0	0	**25**	3	$47,700	280	
Sidewalk	L St	Gum St	Elm St	E		25	25	0	0	0	**50**	2	$75,400	444	
Sidewalk	L St	Gum St	Fir St	W		25	25	0	0	0	**50**	2	$52,900	311	
Class III Bike Route	L St	Pennington Rd	Archer Ave			25	0	0	15	15	**55**	1	$2,500		0.28
Sidewalk	L St	Pennington Rd	Date St	W		25	0	0	15	0	**40**	2	$48,500	285	
Sidewalk	L St	Pennington Rd	Gum St	E		25	25	0	0	0	**50**	2	$72,800	428	
Sidewalk	L St	Pennington Rd	Gum St	W		25	25	0	0	0	**50**	2	$38,700	228	
Sidewalk	Larkin Rd	110 ft S of Jennifer Dr	Nevada St	W		25	0	0	15	0	**40**	2	$291,300	1,714	
Sidewalk	Larkin Rd	275 ft N of Nevada St	72 ft N of Kola Ct	E		25	25	0	15	0	**65**	1	$162,500	956	
Sidewalk	Larkin Rd	Allen St	760 ft S of Kristen St	W		25	0	0	0	0	**25**	3	$206,000	1,212	
Class II Bike Lanes	Larkin Rd	Apricot St	Kristen St			25	0	0	0	15	**40**	2	$15,100		0.34
Sidewalk	Larkin Rd	Elm St	Archer Ave	W	Reconfigure parking (coordinate with property owner)	25	0	0	15	0	**40**	2	$77,700	457	

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Gateway Monument	Larkin Rd	Kristen St		S	Gateway Monument sign	25	0	0	0	15	**40**	2	$1,000		
Class I Shared Use Path	Levee Rd	Sphere of Influence	Sphere of Influence		Collaborate w/ regional partners to create regional trail system	0	25	0	0	0	**25**	3	########		4.05
Class II Bike Lanes	Linda St	Allen St	S Terminus of Linda St		End at Live Oak Soccer Park	0	25	0	0	15	**40**	2	$5,000		0.11
Class I Shared Use Path	Live Oak Community Trail	Near Epperson Way	Kola St		Live Oak Community Trail 4	25	25	0	0	0	**50**	2	$159,900		0.27
Class III Bike Route	Luther Rd	Jasmine Dr	Pennington Rd			0	0	0	0	15	**15**	3	$800		0.09
Sidewalk	Myrtle St	Hwy 99	Railroad	N		0	0	0	15	0	**15**	3	$104,300	613	
Sidewalk	Myrtle St	Hwy 99	Railroad	S		0	0	0	15	0	**15**	3	$104,700	616	
Sidewalk	N St	98 ft N of Plum St	Apricot St	E		25	25	0	0	0	**50**	2	$93,600	550	
Class II Bike Lanes	N St	Elm St	Deanne St			25	0	0	0	15	**40**	2	$33,700		0.77
Sidewalk	N St	Epperson Way	Kola St	W		25	0	0	0	0	**25**	3	$253,100	1,489	
Sidewalk	N St	Fir St	Elm St	W		25	25	0	15	0	**65**	1	$170,400	1,002	
Sidewalk	N St	Gum St	Fir St	E		25	25	0	15	0	**65**	1	$48,600	286	
Sidewalk	N St	Gum St	Fir St	W		25	25	0	15	0	**65**	1	$170,400	1,002	
Class I Shared Use Path	N St	Pennington Rd	California St		Live Oak Community Trail 2	25	25	0	15	0	**65**	1	$15,500		0.03
Sidewalk	N St	Pennington Rd	Gum St	W		25	25	0	15	0	**65**	1	$170,400	1,002	
Sidewalk	Nevada St	Hwy 99	Hall Dr	N	Reconfigure parking (coordinate with property owner)	0	0	0	15	0	**15**	3	$46,600	274	
Sidewalk	Nevada St	Larkin Rd	Hwy 99	N		0	0	0	15	0	**15**	3	$55,100	324	

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Sidewalk	Nevada St	Larkin Rd	Hwy 99	S	Reconfigure parking (coordinate with property owner)	0	0	0	15	0	**15**	3	$50,300	296	
Sidewalk	Nevada St	Ramsdell Dr	Hwy 99	S		0	0	0	15	0	**15**	3	$243,600	1,433	
Sidewalk	O St	152 ft N of Date St	104 ft N of Date St	E		0	25	0	0	0	**25**	3	$24,900	146	
Sidewalk	O St	200 ft S of Pennington Rd	Gum St	W		0	25	0	0	0	**25**	3	$18,200	107	
Curb Ramp	O St	375 ft N of Pennington Rd		W	Curb ramp; trail crossing to sports field	0	25	0	0	15	**40**	2	$6,800		
High Visibility Crosswalk	O St	400 ft N of Pennington Rd			Midblock trail crossing to sports field	0	25	0	0	15	**40**	2	$2,800		
Sidewalk	O St	Fir St	60 ft N of Date St	W		0	25	0	0	0	**25**	3	$183,400	1,079	
Sidewalk	O St	Fir St	Elm St	E		0	25	0	0	0	**25**	3	$117,500	691	
Sidewalk	O St	Gum St	Fir St	E	Reconfigure parking (coordinate with property owner)	0	25	0	0	0	**25**	3	$117,500	691	
Sidewalk	O St	Gum St	Fir St	W		0	25	0	0	0	**25**	3	$183,400	1,079	
Sidewalk	O St	Kola St	280 ft S of Kola St	W		0	25	0	0	0	**25**	3	$47,700	280	
Sidewalk	O St	Pennington Rd	Gum St	E		0	25	0	0	0	**25**	3	$50,600	298	
Sidewalk	Orchard Way	551 ft N of Pennington Rd	800 ft N of Pennington Rd	E		0	25	0	0	0	**25**	3	$42,200	248	
Class II Bike Lanes	P St	Date St	Apricot St			0	0	0	0	15	**15**	3	$8,400		0.19
Study: Control Warrant	P St	Date St		N, S	Stop warrant with high visibility crosswalk	0	25	0	0	15	**40**	2	$10,000		

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Remove Crosswalk	Pennington Rd	205 ft E of Wooley Rd			Existing faded transverse crossing; remove crosswalk	25	25	0	0	15	**65**	1	$1,200		
Speed Feedback Sign	Pennington Rd	280 ft E of J St		S	Existing Speed Feeback Sign at crosswalk, move here to slow drivers down before school crosswalk	25	25	0	0	15	**65**	1	$16,000		
Gateway Monument	Pennington Rd	315 ft E of Sinnard Ave		N	Gateway Monument sign	25	0	0	0	15	**40**	2	$1,000		
Curb Extensions	Pennington Rd	90 ft W of J St		W	Curb extensions	25	25	0	0	15	**65**	1	$30,000		
Sidewalk	Pennington Rd	Connecticut Ave	Deree Ave	S		25	25	20	0	0	**70**	1	$86,300	508	
Yellow High Visibility Crosswalk	Pennington Rd	Connecticut Ave		E	Stop controlled crossing	0	25	0	15	15	**55**	1	$2,800		
Sidewalk	Pennington Rd	Deree Ave	233 ft E of Richard Ave	S		25	25	0	0	0	**50**	2	$64,800	381	
Study: Intersection Improvement	Pennington Rd	Hwy 99			Lead pedestrian interval; during school arrival and dismissal. Crash data shows pedestrians are hit while in crosswalks	25	25	20	15	15	**100**	1	$10,000		
Class II Bike Lanes	Pennington Rd	J St	Broadway			25	25	0	0	15	**65**	1	$26,000		0.59
Remove Crosswalk	Pennington Rd	K St		S	Existing faded transverse crossing; remove crosswalk	25	25	0	0	15	**65**	1	$1,200		
Curb Extensions	Pennington Rd	E of K St			Midblock, east of eastern loading loop driveway	25	25	0	0	15	**65**	1	$30,000		

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Yellow High Visibility Crosswalk	Pennington Rd	E of K St			Midblock, east of eastern loading loop driveway	25	25	0	0	15	**65**	1	$8,000		
RRFB	Pennington Rd	E of K St			Rectangular rapid-flashing beacon. Midblock, east of eastern loading loop driveway	25	25	0	0	15	**65**	1	$27,800		
Curb Extensions	Pennington Rd	L St		N	Curb extensions	25	25	0	0	15	**65**	1	$30,000		
Speed Feedback Sign	Pennington Rd	L St		W	Speed feedback sign	25	25	0	0	15	**65**	1	$16,000		
Yellow High Visibility Crosswalk	Pennington Rd	L St		W	Existing faded transverse crossing	25	25	0	0	15	**65**	1	$2,800		
Class I Shared Use Path	Pennington Rd	Levee Rd	J St		North Side	25	0	0	0	0	**25**	3	$593,400		1.01
Bollards	Pennington Rd	Levee Rd		N	Replace gate with bicycle-friendly bollards	25	25	0	0	15	**65**	1	$800		
Yellow Crosswalk	Pennington Rd	Maple Park		S		25	25	0	0	15	**65**	1	$1,500		
Class I Shared Use Path	Pennington Rd	N St	O St		Live Oak Community Trail 2	25	25	20	15	0	**85**	1	$34,200		0.06
Study: Crossing	Pennington Rd	N St			Pedestrian hybrid beacon; trail crossing, need controls, with high visibility crosswalk	25	25	0	15	15	**80**	1	$20,000		
Curb Extensions	Pennington Rd	Orchard Way		E	Curb extensions	25	25	0	0	15	**65**	1	$30,000		-
Yellow High Visibility Crosswalk	Pennington Rd	Orchard Way		N, E	Existing faded transverse crossing	0	25	0	0	15	**40**	2	$2,800		

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Class II Bike Lanes	Pennington Rd	P St	Connecticut Ave		Move bike lane left of right-turn lane heading west on approach to Connecticut Ave	25	25	0	0	15	**65**	1	$4,300		0.10
Class II Bike Lanes	Pennington Rd	Connecticut Ave	N Township Rd		With roadway improvement project, there is not enough pavement now	25	0	0	0	0	**25**	3	$28,100		0.64
Pedestrian Crossing	Pennington Rd	Railroad			UPRR and CPUC Coordination	25	25	20	15	0	**85**	1	$20,000		
High Visibility Crosswalk	Pennington Rd	Richard Ave		S	Stop controlled crossing	25	0	0	0	15	**40**	2	$2,800		
Sidewalk	Pennington Rd	Sinnard Ave	138 ft W of J St	S		25	25	0	0	0	**50**	2	$109,300	643	
Study: Complete Streets	Pennington Rd	W City Limit	E City Limit		Study corridor for potential roundabout locations to address pedestrian crossings and vehicle queuing	25	25	20	15	15	**100**	1	$100,000		1.55
Sidewalk	Pennington Rd	Wooley Rd	Orchard Way	N		25	25	0	0	0	**50**	2	$58,900	347	
Yellow High Visibility Crosswalk	Pennington Rd	Wooley Rd		N, E	New crossing at desire line for student access from informal loading zone on north side of street.	0	25	0	0	15	**40**	2	$5,600		
Sidewalk	Q St	Date St	Apricot St	E		0	25	0	0	0	**25**	3	$162,900	958	
Sidewalk	Q St	Date St	Apricot St	W		0	25	0	0	0	**25**	3	$156,000	918	
Sidewalk	Q St	Fir St	S end of Q St	E		0	25	0	0	0	**25**	3	$47,800	281	
Sidewalk	Q St	Fir St	S end of Q St	W		0	25	0	0	0	**25**	3	$47,800	281	

Project	Location	Start	End	Side	Notes	Users	Connectivity	Economic Development	Safety	Project Readiness	Total Score	Tier	Cost	Length (ft)	Length (mi)
Sidewalk	R St	Fir St	247 ft S of Fir St	E		0	0	0	0	0	**0**	3	$42,000	247	
Sidewalk	R St	Fir St	S end of R St	W		0	0	0	0	0	**0**	3	$49,300	290	
Pedestrian Crossing	Railroad	Larkin Rd	Broadway		UPRR and CPUC Coordination	0	25	0	0	0	**25**	3	$20,000		
Study: Crossing	Ramsdell Dr	Epperson Way			Railroad bicycle and pedestrian crossing	0	0	0	0	15	**15**	3	$40,000		
Sidewalk	Samuel St	50 ft N of Apricot St	32 ft S of Apricot St	W		0	0	0	0	0	**0**	3	$14,100	83	
Sidewalk	Samuel St	Date St	465 ft S of Date St	W		0	0	0	0	0	**0**	3	$79,200	466	
Class III Bike Route	Tulip St	Kola St	Jasmine Dr			0	25	0	0	15	**40**	2	$1,500		0.17

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Appendix D. Funding Sources

Federal Sources

Fixing America's Surface Transportation Act (FAST Act)

The FAST Act, which replaced Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2015, provides long-term funding certainty for surface transportation projects, meaning States and local governments can move forward with critical transportation projects with the confidence that they will have a Federal partner over the long term (at least five years).

The law makes changes and reforms to many Federal transportation programs, including streamlining the approval processes for new transportation projects and providing new safety tools. It also allows local entities that are direct recipients of Federal dollars to use a design publication that is different than one used by their State DOT, such as the Urban Bikeway Design Guide by the National Association of City Transportation Officials.

More information: https://www.transportation.gov/fastact

Surface Transportation Block Grant Program (STBGP)

The Surface Transportation Block Grant Program (STBGP) provides states with flexible funds which may be used for a variety of highway, road, bridge, and transit projects. A wide variety of bicycle and pedestrian improvements are eligible, including trails, sidewalks, bike lanes, crosswalks, pedestrian signals, and other ancillary facilities. Modification of sidewalks to comply with the requirements of the Americans with Disabilities Act (ADA) is also an eligible activity. Unlike most highway projects, STBGP-funded pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System.

Fifty percent of each state's STBGP funds are suballocated geographically by population. These funds are funneled through Caltrans to the MPOs in the state. The remaining 50 percent may be spent in any area of the state.

STBGP Set-Aside: Transportation Alternatives Program

Transportation Alternatives Program (TAP) has been folded into the Surface Transportation Block Grant program (STBG) as a set-aside funded at $835 million for 2016 and 2017, and $850 million for 2018, 2019, and 2020. Up to 50 percent of the set-aside is able to be transferred for broader STBGP eligibility.

Improvements eligible for this set-aside fall under three categories: Transportation Enhancements (TE), Safe Routes to School (SR2S), and the Recreational Trails Program (RTP). These funds may be used for a variety of pedestrian and streetscape projects including sidewalks, multi-use paths, and rail-trails. TAP funds may also be used for selected education and encouragement programming such as Safe Routes to School.

Non-profit organizations (NGOs) are now eligible to apply for funding for transportation safety projects and programs, including Safe Routes to School programs and bike share.

Complete eligibilities for TAP include:

1. Transportation Alternatives. This category includes the construction, planning, and design of a range of pedestrian infrastructure including "on–road and off–road trail facilities for pedestrians, bicyclists, and other active forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety–related infrastructure, and transportation projects to achieve compliance with the Americans with Disabilities Act of 1990." Infrastructure projects and systems that provide "Safe Routes for Non-Drivers" is still an eligible activity.

2. Recreational Trails. TAP funds may be used to develop and maintain recreational trails and trail-related facilities for both active and motorized recreational trail uses. Examples of trail uses include hiking, in-line skating, equestrian use, and other active and motorized uses. These funds are available for both paved and unpaved trails, but may not be used to improve roads for general passenger vehicle use or to provide shoulders or sidewalks along roads.

   Recreational Trails Program funds may be used for:

   - Maintenance and restoration of existing trails
   - Purchase and lease of trail construction and maintenance equipment
   - Construction of new trails, including unpaved trails
   - Acquisition or easements of property for trails
   - State administrative costs related to this program (limited to seven percent of a state's funds)
   - Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a state's funds)

3. Safe Routes to School. There are two separate Safe Routes to School Programs administered by Caltrans. There is the Federal program referred to as SRTS, and the state-legislated program referred to as SR2S. Both programs are intended to achieve the same basic goal of increasing the number of children walking and bicycling to school by making it safer for them to do so. All projects must be within two miles of primary or middle schools (K-8).

   The Safe Routes to School Program funds non-motorized facilities in conjunction with improving access to schools through the Caltrans Safe Routes to School Coordinator.

   Eligible projects may include:

   - Engineering improvements. These physical improvements are designed to reduce potential bicycle and pedestrian conflicts with motor vehicles. Physical improvements may also reduce motor vehicle traffic volumes around schools, establish safer and more accessible crossings, or construct walkways or trails. Eligible improvements include sidewalk improvements, traffic calming/speed reduction, and pedestrian crossing improvements.
   - Education and Encouragement Efforts. These programs are designed to teach children safe walking skills while educating them about the health benefits and environmental impacts. Projects and programs may include creation, distribution and implementation of educational materials; safety based field trips; interactive pedestrian safety video games; and promotional events and activities (e.g., assemblies, walking school buses).
   - Enforcement Efforts. These programs aim to ensure that traffic laws near schools are obeyed. Law enforcement activities apply to cyclists, pedestrians and motor vehicles alike. Projects may include development of a crossing guard program, enforcement equipment, photo enforcement, and pedestrian sting operations.

4. Planning, designing, or constructing roadways within the right-of-way of former Interstate routes or divided highways. At the time of writing, detailed guidance from the Federal Highway Administration on this new eligible activity was not available.

   - 405 National Priority Safety Program
   - Approximately $14 million annually (5 percent of the $280 million allocated to the program overall) will be awarded to States to decrease bike and pedestrian crashes with motor vehicles. States where bike and pedestrian fatalities exceed 15 percent of their overall traffic fatalities will be eligible for grants that can be used for:
   - Training law enforcement officials on bike/pedestrian related traffic laws
   - Enforcement campaigns related to bike/pedestrian safety
   - Education and awareness programs related to relevant bike/pedestrian traffic laws

Highway Safety Improvement Program (HSIP)
The Highway Safety Improvement Program (HSIP) provides $2.4 billion nationally for projects that help communities achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. Non-infrastructure projects are no longer eligible. Eligible projects are no longer required to collect data on all public roads. Pedestrian safety improvements, enforcement activities, traffic calming projects, and crossing treatments for active transportation users in school zones are examples of eligible projects. All HSIP projects must be consistent with the state's Strategic Highway Safety Plan.

The 2015 California SHSP is located here:
http://www.dot.ca.gov/hq/traffops/shsp/docs/SHSP15_Update.pdf

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) provides funding for projects and programs in air quality nonattainment and maintenance areas for ozone, carbon monoxide, and particulate matter which reduce transportation related emissions. These federal dollars can be used to build pedestrian and bicycle facilities that reduce travel by automobile. Purely recreational facilities generally are not eligible.

To be funded under this program, projects and programs must come from a transportation plan (or State (STIP) or Regional (RTIP) Transportation Improvement Program) that conforms to the SIP and must be consistent with the conformity provisions of Section 176 of the Clean Air Act. States are now given flexibility on whether to undertake CMAQ or STBGP-eligible projects with CMAQ funds to help prevent areas within the state from going into nonattainment.

In the Bay Area, CMAQ funding is administered through the Metropolitan Transportation Commission (MTC) on the local level. These funds are eligible for transportation projects that contribute to the attainment or maintenance of National Ambient Air Quality Standards in non-attainment or air-quality maintenance areas. Examples of eligible projects include enhancements to existing transit services, rideshare and vanpool programs, projects that encourage pedestrian transportation options, traffic light synchronization projects that improve air quality, grade separation projects, and construction of high-occupancy vehicle (HOV) lanes. Projects that are proven to reduce direct PM2.5 emissions are to be given priority.

State Sources

Active Transportation Program (ATP)

In 2013, Governor Brown signed legislation creating the Active Transportation Program (ATP). The ATP program is administered by Caltrans Division of Local Assistance, Office of Active Transportation and Special Programs.

This program is a consolidation of the Federal Transportation Alternatives Program (TAP), California's Bicycle Transportation Account (BTA), and Federal and California Safe Routes to School (SRTS) programs. Program goals include:

- Increase the proportion of trips accomplished by biking and walking,
- Increase safety and mobility for nonmotorized users,
- Advance the active transportation efforts of regional agencies to achieve greenhouse gas reduction goals,
- Enhance public health,
- Ensure that disadvantaged communities fully share in the benefits of the program, and
- Provide a broad spectrum of projects to benefit many types of active transportation users.

The California Transportation Commission ATP Guidelines are available here:
http://www.catc.ca.gov/meetings/agenda/2014Agenda/2014_03/03_4.12.pdf

Eligible pedestrian and Safe Routes to School projects include:

- Infrastructure Projects: Capital improvements that will further program goals. This category typically includes planning, design, and construction.
- Non-Infrastructure Projects: Education, encouragement, enforcement, and planning activities that further program goals. The focus of this category is on pilot and start-up projects that can demonstrate funding for ongoing efforts.
- Infrastructure projects with non-infrastructure components

The minimum request for non-SRTS projects is $250,000. There is no minimum for SRTS projects.

More information: http://www.dot.ca.gov/hq/LocalPrograms/atp/

Office of Traffic Safety (OTS) Grants

Office of Traffic Safety Grants are supported by Federal funding under the National Highway Safety Act and SAFETEA-LU. In California, the grants are administered by the Office of Traffic Safety.

Grants are used to establish new traffic safety programs, expand ongoing programs or address deficiencies in current programs. Eligible grantees are governmental agencies, state colleges, state universities, local city and county government agencies, school districts, fire departments, and public emergency services providers. Grant funding cannot replace existing program expenditures, nor can traffic safety funds be used for program maintenance, research, rehabilitation, or construction. Grants are awarded on a competitive basis, and priority is given to agencies with the greatest need. Evaluation criteria to assess need include potential traffic safety impact, crash statistics and rankings, seriousness of problems, and performance on previous OTS grants.

The California application deadline is January of each year. There is no maximum cap to the amount requested, but all items in the proposal must be justified to meet the objectives of the proposal.

More information: http://www.ots.ca.gov/

Regional & Local Sources

Regional Active Transportation Program

The Regional Active Transportation Program (ATP) targets projects that increase walking, improve safety, and benefit disadvantaged communities. For Live Oak, regional ATP funding will be allocated through the Sacramento Area Council of Governments (SACOG). The ATP was created to fund bicycle and pedestrian infrastructure and non-infrastructure projects. The ATP combines many federal and state funding streams previously used for pedestrian, safety, and other related purposes into one funding stream with broad eligibilities.

More information: http://www.sacog.org/regionalfunding/activetransportation.cfm

Bicycle & Pedestrian Funding Program

The regional Bicycle & Pedestrian Funding Program (BPFP) is closely aligned with the regional ATP funding, and both are administered by SACOG. The regional BPFP concentrates on project performance to implement the Metropolitan Transportation Plan and Sustainable Communities Strategy. Only applicants in Sacramento, Sutter, Yolo, and Yuba Counties are eligible to apply for BPFP funds.

Eligible projects generally include those that support the construction of infrastructure with walking, bicycling, or transit use as primary transportation considerations. Projects that provide facilities for walking and bicycling between the communities of the Sacramento region are also eligible.

More information: http://www.sacog.org/regionalfunding/fundingprograms_bikeped-overview.cfm

Developer Impact Fees

As a condition for development approval, municipalities can require developers to provide certain infrastructure improvements, which can include bicycle and pedestrian projects. The type of facility

that should be required to be built by developers should reflect the greatest need for the particular project and its local area. Legal challenges to these types of fees have resulted in the requirement to illustrate a clear nexus between the particular project and the mandated improvement and cost.

New Construction

Future road widening and construction projects are one means of providing sidewalks and other pedestrian facilities. To ensure that roadway construction projects provide pedestrian facilities where needed, it is important that the review process includes input pertaining to consistency with the proposed system. In addition, California's 2008 Complete Streets Act and Caltrans's Deputy Directive 64 require that the needs of all roadway users be considered during "all phases of state highway projects, from planning to construction to maintenance and repair."

More information: http://www.dot.ca.gov/hq/tpp/offices/ocp/complete_streets.html

Restoration

Cable TV and telephone companies sometimes need new cable routes within public rights of way. Recently, this has most commonly occurred during expansion of fiber optic networks. Since these projects require a significant amount of advance planning and disruption of curb lanes, it may be possible to request reimbursement for affected pedestrian facilities to mitigate construction impacts. In cases where cable routes cross undeveloped areas, it may be possible to provide for new pedestrian facilities following completion of the cable trenching, such as sharing the use of maintenance roads.

Bank of America Charitable Foundation, Inc.

The Bank of America Charitable Foundation is one of the largest in the nation. The primary grants program is called Neighborhood Excellence, which seeks to identify critical issues in local communities. Another program that applies to greenways is the Community Development Programs, and specifically the Program Related Investments. This program targets low and moderate income communities and serves to encourage entrepreneurial business development.

More information: http://www.bankofamerica.com/foundation

Robert Wood Johnson Foundation

The Robert Wood Johnson Foundation was established as a national philanthropy in 1972 and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans. Grant making is concentrated in four areas:

- To assure that all Americans have access to basic health care at a reasonable cost
- To improve care and support for people with chronic health conditions
- To promote healthy communities and lifestyles
- To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs

More information: http://www.rwjf.org/applications/

Community Action for a Renewed Environment (CARE)

CARE is a competitive grant program that offers an innovative way for a community to organize and take action to re-duce toxic pollution in its local environment. Through CARE, a community creates a partnership that implements solutions to reduce releases of toxic pollutants and minimize people's exposure to them. By providing financial and technical assistance, EPA helps CARE communities get on the path to a renewed environment. Transportation and "smart-growth" types of projects are eligible. Grants range between $90,000 and $275,000.

More information: http://www.epa.gov/care/

Corporate Donations

Corporate donations are often received in the form of liquid investments (i.e. cash, stock, bonds) and in the form of land. Employers recognize that creating places to walk is one way to build community and attract a quality work force. Municipalities typically create funds to facilitate and simplify a transaction from a corporation's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented. Such donations can improve capital budgets and/or projects.

Other Sources

Additional local sales taxes, fees or permits may be implemented as new funding sources for pedestrian projects. However, any of these potential sources would require a local election. Volunteer programs may be developed to substantially reduce the cost of implementing some routes, particularly multi use paths. For example, a local college design class may use such a multi-use route as a student project, working with a local landscape architectural or engineering firm. Work parties could be formed to help clear the right of way for the route. A local construction company may donate or discount services beyond what the volunteers can do. A challenge grant program with local businesses may be a good source of local funding, in which the businesses can "adopt" a route or segment of one to help construct and maintain it.

Appendix E. Active Transportation Program Compliance

This Plan meets eligibility criteria as laid out by the Active Transportation Program. Table E-1 lists these criteria and identifies the location in this Plan where the relevant information can be found.

Table E-1: Active Transportation Program Compliance

Subject	ATP Compliance Checklist	Page/Location In Plan
Future Trip Estimates	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.	P7-9 "Future Trip Estimates"
Collision Report	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.	p3-1 "Collision Analysis" p4-2 "Goal 1: Safety"
Land Use Patterns	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.	p2-1 "Land Use" p2-3 "Walking and Bicycling Attractors and Generators"
Existing and Proposed Facilities and Programs	A map and description of existing and proposed bicycle transportation facilities, including a description of bicycle facilities that serve public and private schools and, if appropriate, a description of how the five Es (Education, Encouragement, Enforcement, Engineering, and Evaluation) will be used to increase rates of bicycling to school.	p2-9 "Walking and Bicycling Conditions" p5-1 "Infrastructure Projects" p6-2 "Student Bicycle and Pedestrian Safety Education" p6-3 "Encouragement" p6-5 "Evaluation"
End-of-Trip Bicycle Parking	A map and description of existing and proposed end-of-trip bicycle parking facilities	p2-12 Figure 2-6 p5-2 "Bicycle Parking"
Bicycle Parking Policy	A description of existing and proposed policies related to bicycle parking in public locations, private parking garages and parking lots and in new commercial and residential developments.	p5-2 "Bicycle Parking"
Bicycle Connections to other Modes	A map and description of existing and proposed bicycle transport and parking facilities for connections with and use of other transportation modes. These must include, but not be limited to, parking facilities at transit stops, rail and transit terminals, ferry docks and landings, park and ride lots, and provisions for transporting bicyclists and bicycles on transit or rail vehicles or ferry vessels.	p2-7 "Transit" p2-12 Figure 2-6 *There are no rail or transit terminals, nor park and ride lots, ferry docks or landings in Live Oak.*
Pedestrian Connections to other Modes	A map and description of existing and proposed pedestrian facilities at major transit hubs. These must include, but are not limited to, rail and transit terminals, and ferry docks and landings.	*There are no rail or transit terminals, nor ferry docks or landings in Live Oak.*

Subject	ATP Compliance Checklist	Page/Location In Plan
Wayfinding	A description of proposed signage providing wayfinding along bicycle and pedestrian networks to designated destinations.	p5-1 "Wayfinding Program"
Maintenance	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, freedom from encroaching vegetation, maintenance of traffic control devices including striping and other pavement markings, and lighting.	P7-9 "Maintenance"
Education Programs	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 accidents involving bicyclists and pedestrians.	p2-14 "Programs"
Community Involvement	A description of the extent of community involvement in development of the plan, including disadvantaged and underserved communities.	p3-11 "Community Identified Needs"
Regional Plan Coordination	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.	Appendix A
Project List	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.	Chapter 5, Chapter 6, Chapter 7, and Appendix C
Past Expenditures and Future Financial Needs	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.	pA-23 "Past Expenditures for Bicycle and Pedestrian Facilities and Programs"
Implementation	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 7
Adoption Resolution	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.	Forthcoming