City of Milpitas

Bikeway Master Plan Update

Final Plan

Prepared by
Alta Planning + Design
June 2009

CITY OF MILPITAS BIKEWAY MASTER PLAN UPDATE

Bicycle Pedestrian Advisory Commission

C I T Y O F M I L P I T A S

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I. Executive Summary

The Milpitas Bikeway Master Plan Update is an update to the City's previous 2002 Bikeway Plan. To develop the Bikeway Master Plan Update, the City worked with its Bicycle Pedestrian Advisory Commission (BPAC) as well as the general public. The planning process included a series of meetings with the BPAC and a public workshop where citizens were invited to provide input on proposed bicycle projects and programs. Included in the Plan are:

- Goals, Objectives, and Benchmarks for Bicycling

  The goals and objectives incorporate the "4 E's" of planning for bicyclists – Engineering, Education, Encouragement, and Enforcement – recognizing that an approach drawings from all 4 E's is the most successful to improve safety and increase the number of Milpitas residents bicycling for work, shopping, school, and recreation.

- A Review of Existing Bicycling Conditions

  The City of Milpitas' existing bikeway network consists of approximately 8 miles of off-street paved bicycle paths, nearly 20 miles of bike lanes and 9 miles of bike routes.

- Descriptions of Relevant Local and Regional Plans and Policies Related to Bicycling

  Plans and policies are considered relevant if they directly address bicycle facilities, or if they address land-use patterns that affect bicyclists. The Bikeway Master Plan Update builds upon and enhances the bicycle related policies already established for the area. Relevant area and specific plans, citywide plans, the Municipal Code, and regional plans are all reviewed.

- An Analysis of Bicycling Needs

  In Milpitas, there are different needs for commuter and recreational bicyclists. This is based on existing bicycle facilities and programs, input from the public, historical bicycle collision data, and the estimated number of existing bicyclists. This section of the Plan contains information on this needs assessment including a review of the public workshop that included approximately 25 members of the public, a summary of bicycle related collisions from the last five years, and the estimated 800 bicyclists riding in Milpitas everyday.

A bicyclist on the San Francisco Bay Trail in Milpitas

- Recommended Bicycle Projects, Cost Estimates, and Priorities for Implementation

  This Plan recommends on- and off-street bicycle improvements, traffic signal improvements, facilities near schools, and bicycle signage enhancements. These facilities are recommended with cost estimates and priorities

for implementation. This table includes the lengths of proposed improvements and the total cost estimates for each recommended facility type. Implementation is proposed for a 20 year period. The highest priority projects have detailed cost estimates in the Appendix. These priorities are based on proximity to schools, transit, public buildings, existing bicycle facilities, and historic collisions involving bicycles.

Bicycle Facility Type	Mileage	Total Cost
Class I Bike Paths – Expanding the Path Network	6.07	$5,605,989
Class I Bike Paths – Transit Area Crossings	0.84	$20,000,000
Class I Bike Paths Subtotal	*6.94*	*$25,605,989*
Class II Bike Lanes – Vehicle Lane Reductions	1.22	$176,798
Class II Bike Lanes - Arterial Connections	7.71	$481,341
Class II Bike Lanes Subtotal	*8.93*	*$658,139*
Class III Bike Route - Arterial Connections	5.51	$114,659
Class III Bike Routes - Neighborhood Connections	6.21	$162,242
Class III Bike Routes – Recreational Rides	3.71	$81,880
Class III Bike Routes Subtotal	*15.43*	*$358,781*
Total	*31.3*	*$26,622,909*

Notes: Costs are in 2008 dollars.

- Recommended Bicycling Programs

  Bicycle programs help educate bicyclists and motorists, enforce the rules of the road, encourage riding, and evaluate progress. A series of these programs are recommended in the Plan with priorities for implementation. The highest priority programs are expanding the existing Safe Routes to School Program and Bike to Work/School Day in Milpitas and implementing a program for evaluating the number of existing bicyclists on an annual basis.

- Funding sources for Bicycle Projects and Programs

  Federal, state, regional, local, and non-traditional funding sources are reviewed for bicycle infrastructure and programs, including the total dollar amount available for bicycle improvements and the source of the funds.

- Design Guidelines with best practices for implementing bikeways

  The Appendix of the Plan includes basic bikeway planning and design guidelines for use in developing the Milpitas bikeway system and support facilities. Designs are for elements required by the State of California for compliance with Caltrans Highway Design Manual Chapter 1000 "Bikeway Planning and Design" guidelines and the California Manual of Uniform Traffic Control Devices. Also included are some experimental or nonstandard bikeway designs.

II. BTA Compliance Checklist

In order to meet the California Bicycle-Transportation Act requirements, the 2008 Milpitas Bikeway Master Plan must include the following provisions:

Table 1 - Milpitas BTA Compliance Checklist

BTA 891.2	Required Plan Elements	Location Within the Plan
(a)	The estimated number of existing bicycle commuters in the plan area and the estimated increase in the number of bicycle commuters resulting from implementation of the plan.	Table 5-5; page 5-7 Table 5-5; page 5-8
(b)	A map and description of existing and proposed land use and settlement patterns which shall include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings, and major employment centers.	Figure 4-3.; page 4-7
(c)	A map and description of existing and proposed bikeways.	Figure 3-2; page 3-3 Table 3-1 pages 3-4 and 3-5 Figure 6-1 page 6-2 Tables 6-2 to 6-8, pages 6-6 to 6-10
(d)	A map and description of existing and proposed end-of-trip bicycle parking facilities. These shall include, but not be limited to, parking at schools, shopping centers, public buildings, and major employment centers.	Figure 3-2, page 3-3 Table 3-2, pages 3-5 and 3-6 Table 3-3, pages 3-7 to 3-9 Table 6-9, pages 6-10 and 6-11
(e)	A map and description of existing and proposed bicycle transport and parking facilities for connections with and use of other transportation modes. These shall include, but not be limited to, parking facilities at transit stops, rail and transit terminals.	Figure 3-2, page 3-3 Table 3-2, pages 3-5 and 3-6 Table 6-9, pages 6-10 and 6-11
(f)	A map and description of existing and proposed facilities for changing and storing clothes and equipment. These shall include, but not be limited to, locker, restroom, and shower facilities near bicycle parking facilities.	Figure 3-2, page 3-3 Text 6-11
(g)	A description of bicycle safety and education 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 Vehicle Code.	Figure 5-1, pages 5-3 and 5-4
(h)	A description of the extent of citizen and community involvement in development of the plan.	Page 5-3
(i)	A description of how the bicycle transportation plan has been coordinated and is consistent with other local or regional transportation, air quality, or energy conservation plans.	Chapter 4, pages 4-1 to 4-15
(j)	A description of the projects proposed in the plan and a listing of their priorities for implementation.	Text and Tables Pages 6-1 to 6-13 and 8-1 to 8-9
(k)	A description of past expenditures for bicycle facilities and future financial needs for projects that improve safety and convenience for bicycle commuters in the plan area.	Page 3-6

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1. Purpose of the Plan

This Bikeway Master Plan Update provides a broad vision, strategies and actions for the improvement of bicycling in Milpitas. It builds upon the City's previous Bikeway Master Plan from 2002 that the City's Bicycle Pedestrian Advisory Commission (BPAC) produced. The City of Milpitas has an existing bikeway system that this plan will improve into the future. The Bikeway Master Plan Update connects the existing on-street network and builds upon the existing bike path system in Milpitas to increase bicycle connectivity to schools, public buildings, places of employment, shopping, and to access transit. The Plan looks to regional bicycle connections in neighboring jurisdictions and regional trails. In addition to on-the-ground facilities, the Bikeway Master Plan Update seeks to encourage new bicyclists of all ages as well as educate bicyclists and motorists on proper rules of the road.

The Bikeway Master Plan prioritizes future bicycle projects in Milpitas and satisfies requirements of the California Bicycle Transportation Account. This maximizes potential opportunities for the City of Milpitas to apply for project and program funding.

The intention of Milpitas' Bikeway Master Plan Update is to:

1. Document and increase awareness of existing bicycle infrastructure,
2. Identify and prioritize the location of bicycle infrastructure improvements, and
3. Provide recommendations for new policies to increase bicycle safety in the City using industry-standard best practices.

The Plan Update integrates the Milpitas General Plan goals of expanding bikeway facilities and providing an integrated on-street/off-street bicycle network. This plan capitalizes on Milpitas' strengths including the existing bikeway network, potential bicyclist use of creek and railroad rights–of-way, existing and future transit connections, neighborhood school, and access to regional trails.

The goals and objectives presented in Chapter 2 guide Milpitas' Bikeway Master Plan Update.

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2. Goals, Objectives, & Benchmarks

The following goals, objectives, and benchmarks provide a blueprint for making bicycling an integral part of daily life in Milpitas. The goals and objectives incorporate the "4 E's" of planning for bicyclists – Engineering, Education, Encouragement, and Enforcement – recognizing that an approach that draws from all 4 E's will be the most successful to improve safety and increase the number of Milpitas residents bicycling for work, shopping, school, and recreation. These goals, objectives, and benchmarks are consistent with the Milpitas General Plan's guiding principle of "providing a comprehensive system of sidewalks, bicycle lanes and routes and off-street trails that connect all parts of the City."

NOTE: These goals, objectives and benchmarks are presented as proposed guidelines and are subject to change.

Goal 1 Improve bicycle safety in Milpitas

Objective 1-1: Monitor and enhance Bicycle Safety

Benchmarks: Using annual crash data reports, monitor and implement improvements to increase awareness of bicyclists.

Objective 1-2: Construct and retrofit bikeway facilities to meet minimum engineering guidelines.

Objective 1-3: Incorporate bicycle amenities into all new transportation infrastructure and into major transportation retrofits, as possible.

Benchmarks: Miles of bikeway facilities that meet or exceed Caltrans recommended guidelines.

Objective 1-4: Proactively enforce bicycle-related traffic laws through activities such as targeted enforcement or a police-staffed checkpoint where officers distribute bicycle related information.

Benchmarks: Number of proactive enforcement activities, number of bicyclists and drivers contacted, number of reported violations of bicyclist right-of-way.

Goal 2 Increase bicycle trips made in Milpitas

Objective 2-1: Promote and support Milpitas' annual Bike to Work Day.

Benchmarks: Increase bicycle commute mode share to 1.0% of all trips by 2018.[1]

Objective 2-2: Increase the number of students who bike to school by promoting events such as International Walk and Bike to School Day and

[1] The bicycle commute mode share for Milpitas in 1990, 2000, and 2006 were 0.4%, 0.5% and 0.6%, respectively (US Census).

providing schools with the resources to develop Safe Routes to School programs.

Benchmarks: Number of students who bike to school in the fall and in the spring using in-class hand raising surveys, number of promotional activities at schools.

Goal 3 Connect Milpitas' bikeways to the regional bicycle system.

Objective 3-1: Work with the Santa Clara County Parks and Recreation Department, the San Francisco Bay Trail, and neighboring jurisdictions to identify opportunities for bikeway connections.

Objective 3-2: Work with Fremont, San Jose, and Santa Clara County to coordinate on-street and off-street bicycle facility construction, signage and maintenance.

Benchmarks: Miles of trails and bikeways connected, conduct annual counts and surveys of bicycle travel at key locations on the bikeway system.

Goal 4 Ensure that all residents of Milpitas are knowledgeable about bicycle safety.

Objective 4-1: Educate Milpitas students about bicycle safety with in-classroom bicycle safety training, conducted by a police officer or other certified trainers.

Benchmark: Number of students who complete bicycle safety training.

Objective 4-2: Provide bicycle safety information in local publications, such as the City's website, television, and radio stations, and in all public City buildings.

Objective 4-3: Provide adult education for bicycle safety through Milpitas' recreational centers.

Objective 4-4: Continue support of the Santa Clara County Juvenile Traffic Diversion Program

Benchmark: Number of people who complete the training.

Goal 5: Enhance bicycle access to public transit and increase the number of people who bike to public transit in Milpitas.

Objective 5-1: Work with the VTA to promote biking to bus and light rail transit stops within Milpitas.

Objective 5-2: Work with the VTA and BART to ensure bicycle access to the planned BART extension.

Benchmarks: Increase bicycle access mode share to the VTA bus and rail lines 1 percent per year for the next five years, miles of projects accessing public transit completed, number of bicycle facilities installed at public transit stations.

Goal 6:Promote bicycling as an integral mode of transportation in Milpitas

Objective 6-1: Team with neighboring communities and with the Silicon Valley Bicycle Coalition to promote bicycling in Milpitas.

Objective 6-2: Provide secure bicycle valet parking at City-sponsored events in partnership with the Silicon Valley Bicycle Coalition.

Goal 7: Improve bicycle connections to Milpitas' community amenities, parks, and schools.

Objective 7-1: Maintain Milpitas' bikeways to the highest level possible.

Objective 7-2: Conduct annual bike audits at Milpitas schools, with parents, teachers and students, to identify obstacles to biking to school and brainstorm improvements.

Goal 8: Identify funding sources to design, construct and maintain Milpitas' bikeways.

Objective 8-1: Apply for bikeway grants from local, regional and state funding sources.

Objective 8-2: Seek opportunities for private donations to construct bikeways and related amenities

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3. Existing Conditions

3.1. Location

The City of Milpitas is situated on the eastern shore of the San Francisco Bay, in Santa Clara County, just south of Alameda County. Milpitas encompasses about 13.5 square miles of land, and borders Fremont on the north, San Jose on the south and west, and unincorporated county to the east. The topography of Milpitas varies, from the low flat valley floor in the west to the steep hillside in the east. Milpitas has nearly 65,000 residents. Education facilities include Milpitas Unified School District Schools and seven private schools. The City is well-connected to its metropolitan region via Interstates 680 and 880, State Route 237, Montague Expressway, and the Valley Transportation Authority (VTA) light rail and bus lines, Caltrain Stations, and the Fremont BART station.

3.2. Land Uses

Development in Milpitas is concentrated on the valley floor. Of the developed land in this area, about one-third is dedicated to single-family residential use. Milpitas is also home to industrial parks, manufacturing plants, and regional and community serving retail centers. The city's two largest employers are Cisco Systems and Lifescan, Inc. About 15 percent of the total land on the valley floor is vacant and available for development.

Milpitas has been one of the fastest expanding cities in the Bay Area, and grew by 4.4 percent in 2007.[2] As a result, it is critical that land be set aside for the expansion of bikeway and the trail system with each planned development and redevelopment program. Furthermore, Milpitas has a relatively dispersed development pattern, and planning for the bicycle network must take into account that people live everywhere within the urbanized area, employment, shopping and recreational destinations are located throughout the city, and bicycle facilities should provide access to and from all areas of these destinations.

3.3. Existing Bicycle Facilities

The City of Milpitas' existing bikeway network consists of approximately 8 miles of off-street paved bicycle paths, nearly 20 miles of bike lanes and 9 miles of bike routes.

This Plan refers to bikeways using Caltrans standard designations. The three types of bikeways identified by Caltrans in Chapter 1000 of the Highway Design Manual are defined below. **Figure 3-1 - Caltrans Bikeway Classifications** illustrates the three types of bikeways.

> Class I Bikeway: Typically called a "bike path or shared use path," a Class I Bikeway provides bicycle travel on a paved right-of-way completely separated from any street or highway.

[2] California Department of Finance, *Cities Ranked by Total Population, Numeric Change, and Percent Change,* 2008.

Class II Bikeway: Often referred to as a "bike lane," a Class II Bikeway provides a striped and stenciled lane for one-way travel on a street or highway.

Class III Bikeway: Generally referred to as a "bike route," a Class III Bikeway provides for shared use with pedestrian or motor vehicle traffic and is identified only by signing.

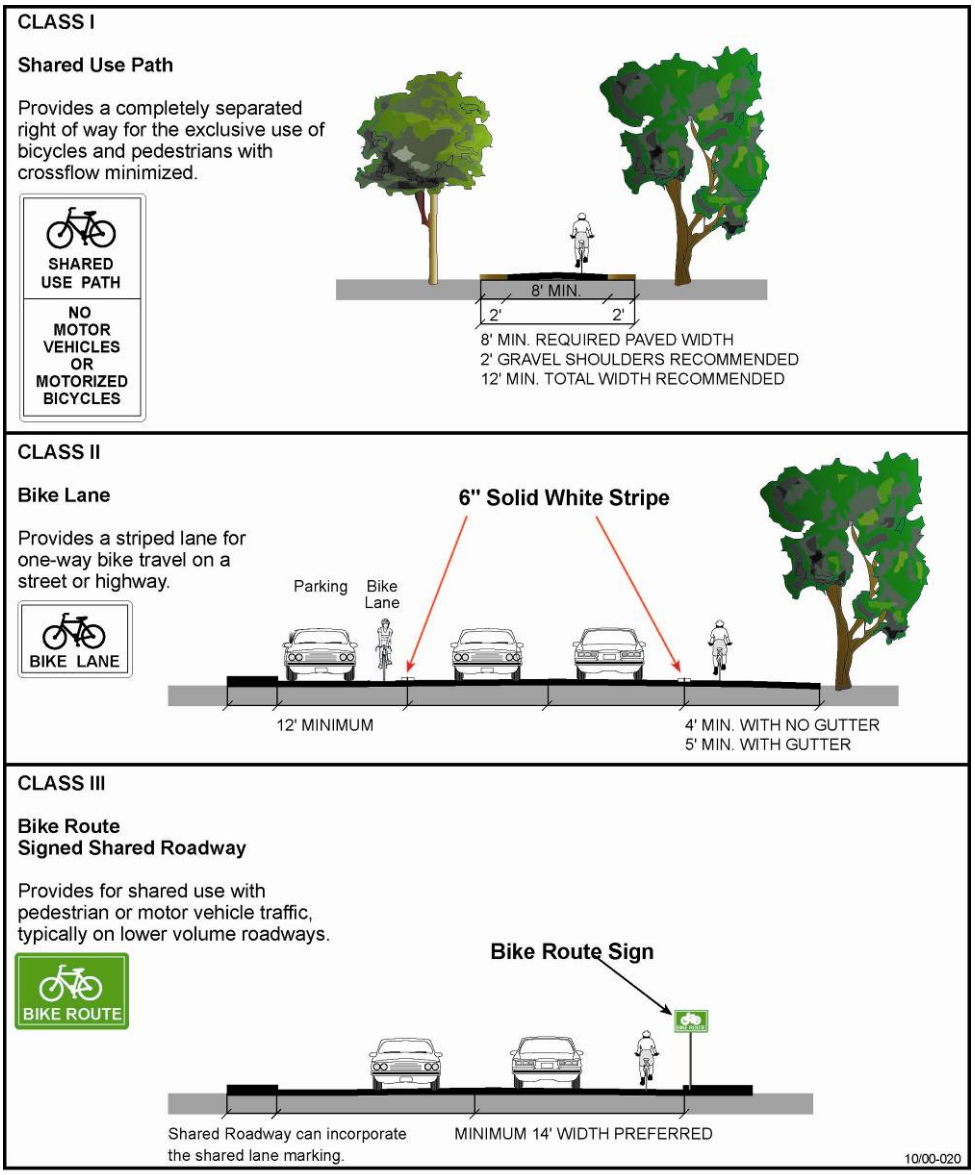

Figure 3-1 - Caltrans Bikeway Classifications

Figure 3-2 – Existing Bicycle Network shows the existing bicycle network in Milpitas. The network consists primarily of Class II on-street bike lanes on the City's major arterials. The major Class I bike paths connects southeast from Russell Lane, to Jacklin Road, through Oliver Jones Park, to Peter Gill Park and along Coyote Creek from Dixon Landing Road to Highway 237. **Table 3-1 – Existing Bicycle Facilities** shows the limits and lengths of all existing bikeway segments in the City.

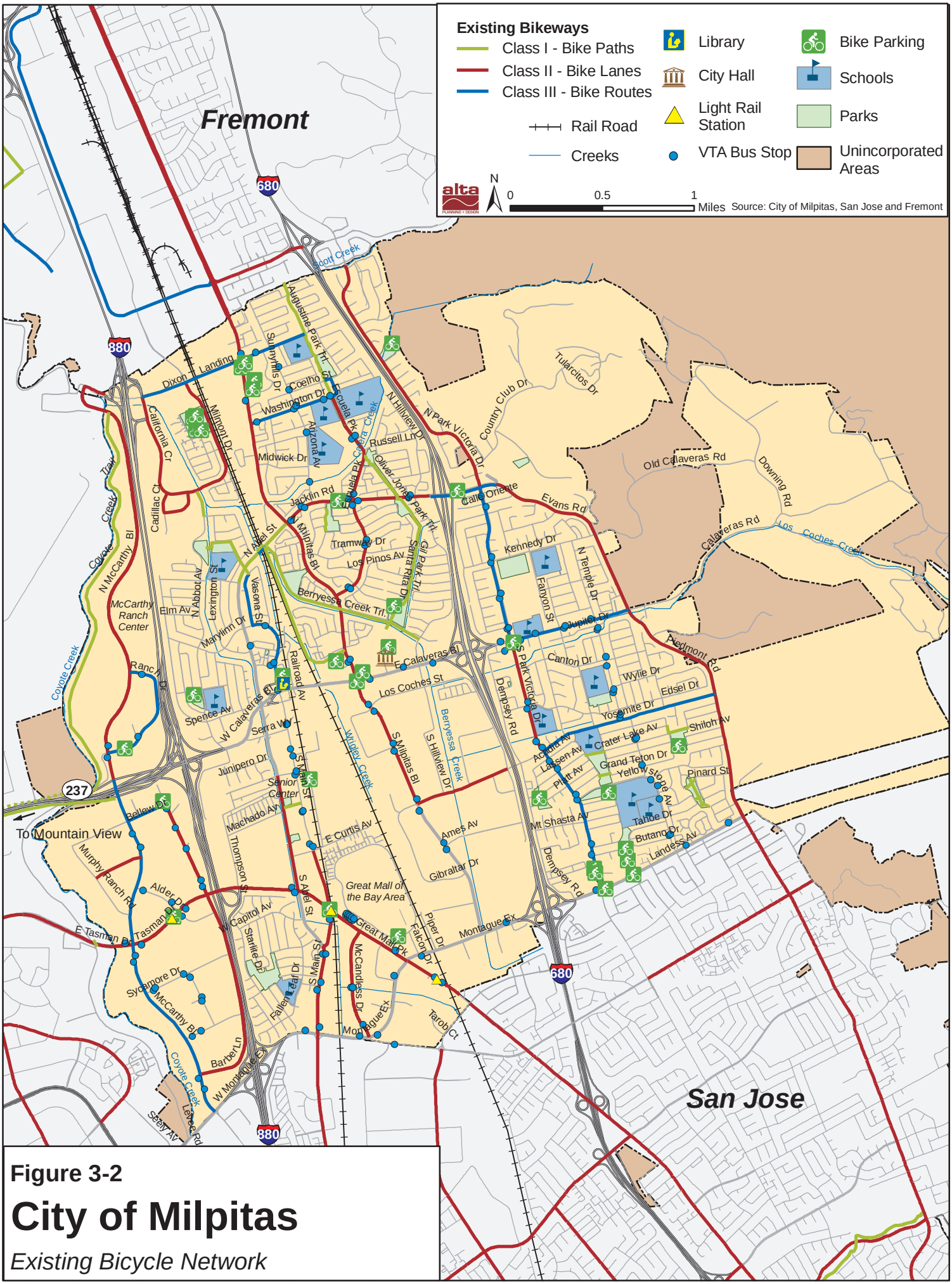

Figure 3-2

City of Milpitas

Existing Bicycle Network

Table 3-1 – Existing Bicycle Facilities

Class	Street/Path	Start	End	Miles
I	Abel St	Redwood Ave	N Milpitas Blvd	0.20
I	Abel St	Redwood Ave	N Milpitas Blvd	0.17
I	Abel Overpass	Pathway adjacent to route over the rail road		0.05
I	Augustine Park	Manferd Street	Coelho Street	0.68
I	Ben Rogers Park 1	Shenandoah Ave	Mesa Verde Drive	0.16
I	Connector Trail	S Abel St	S Main St	0.10
I	Coyote Creek Trail	Dixon Landing Rd	HWY 237	2.28
I	Gill Park	Tramway Drive	Paseo Refugio (Gill Memorial Park)	0.53
I	Hillcrest Park 1	Whitcomb Court	Pinard Street	0.07
I	Hillcrest Park 2	North end of Hillcrest Park	South end of Hillcrest Park	0.15
I	Hillcrest Park 3	Cuesta Drive	Moulton Drive	0.07
I	Hillcrest Park 3	Fieldcrest Drive	Chipman Drive	0.05
I	Murphy Elem School	Lassen Ave	Crater Lake Ave	0.12
I	Murphy Park	Saratoga Dr	Grand Teton Dr	0.07
I	Oliver Jones Park	Escuela Park	Tramway Drive	0.64
I	Rail Road Path	N Abel St	N Milpitas Dr	0.88
I	San Andreas Drive	California Circle	San Andreas Dr	0.15
I	Strickroth Park	Strickroth Drive	Hamilton Ave	0.14
I	Vasona Path	Coyote Street	Vasona Street	0.37
I	Berryessa Creek	N Abel St	N Hillview Dr	1.04
			Total Class I Length	*7.89*
II	Alder Drive	McCarthy Blvd	Barber Ln	0.50
II	Bellew/Barber	McCarthy Blvd @ Bellew Drive	McCarthy Blvd @ Barber Lane	1.72
II	Cadillac Ct/Fairview Wy	California Cir	California Cir	0.31
II	California/Milmont	Dixon Landing	Circles community south of Dixon Landing to Milmont	1.46
II	Capitol Avenue	Montague Expressway	Northwood Plaza	0.34
II	Escuela Parkway	Washington Drive	N Milpitas Blvd	1.23
II	Evans Road	Kennedy Drive	E Calaveras Blvd	0.45
II	Evans Road	Jacklin Road	Kennedy Drive	0.63
II	Jacklin Road	N Milpitas Blvd	Evans Road	0.82
II	Main Street	E Calaveras Blvd	W Montague Expressway	1.91
II	McCarthy Blvd	Dixon Landing	SR 237	2.49
II	Milpitas Blvd	Warm Springs Blvd	Yosemite Drive	2.91
II	Park Victoria Drive	Bolton Drive	Nicklaus Avenue	1.51
II	Park Victoria Drive	E Calaveras Blvd	Yosemite Drive	0.63
II	Piedmont Road	E Calaveras Blvd	Landess Avenue	1.39
II	S Abel Street	Corning Avenue	Great Mall Parkway	0.64
II	Scandisk	McCarthy Blvd	Murphy Ranch Rd	0.27
II	Tasman Drive	Coyote Creek	Alder Drive	0.42
II	Yosemite Drive	S Milpitas Blvd	Sinclair Frontage Road	0.53
			Total Class II Length	*20.16*

Class	Street/Path	Start	End	Miles
III	Abel Overpass	Route over the rail road tracks		0.05
III	Bellew Drive	McCarthy Blvd	Barber Lane	0.22
III	Calaveras Blvd	S Park Victoria Blvd	Spring Valley Lane	0.66
III	Dixon Landing Road	California Circle	Augustine Park Path	0.95
III	Jacklin Road	N Milpitas Blvd	Evans Road	0.37
III	McCarthy Blvd	Hwy 237	W Montague	1.98
III	Park Victoria Drive	Nicklaus Avenue	E Calaveras Blvd	0.86
III	Park Victoria Drive	Yosemtie Drive	Landess Avenue	0.84
III	Ranch Drive	Encircles the southern east side of McCarthy Blvd		0.70
III	Roger Street	Coelho Street	Escuela Parkway	0.15
III	Vasona/Marylinn/Main	Coyote Street	E Calaveras Blvd	0.76
III	Washington Drive	N Milpitas Blvd	Escuela Parkway	0.47
III	Yosemite Drive	S Park Victoria Drive	Piedmont Road	0.99
			Total Class III Length	*8.99*

3.4. Existing Bicycle Parking

As Figure 3-2 shows and as listed in **Table 3-2 - Existing Bicycle Parking**, the City of Milpitas has bicycle parking at public and private buildings and developments. These bicycle parking facilities are short-term bicycle rack spaces with the exception of the two VTA rail stations where there are both short-term parking spaces and bicycle lockers. All of Milpitas' schools have bicycle parking described in greater detail in section 3.6.1.

Table 3-2 - Existing Bicycle Parking

Location	Address
Ben Rodgers Park	N Milpitas Blvd and Dixon Landing Road
City Hall	455 E Calaveras Blvd
Creighton Park	Olympic west of S Park Victoria
Dixon Landing Baseball Fields	Milmont Dr and Jurgens Dr
Dixon Landing Park	Dixon Landing and Milmont
Dixon Landing Shopping Center	N Milpitas Blvd and Dixon Landing Rd
Dixon landing Tennis Courts	Minmont Drive and Jurgens Drive
Fitness USA	1818 Clear Lake Ave
Foothill Square	367 Jacklin Rd
Golfland	1199 Jacklin Rd
Great Mall of the Bay Area	447 Great Mall Dr
Jose Higuera Adobe City Park	Wessex off N Park Victoria
Library	160 N Main Street
Lions Market	1838 N Milpitas Blvd
Longs Drugs Store	S Milpitas Blvd and E Calaveras Blvd
McCarthy Market Place	125 Ranch Dr Milpitas
McDonald's	1795 Landess Ave, Milpitas
McDonald's	N Milpitas Blvd and Dixon Landing Rd
Milpitas Square	190 Barber Lane

Location	Address
Mission Lanes	1287 S Park Victoria Dr
Ocean Supermarket	2 S Park Victoria Dr
Park and Ride Lot	East side of Hammond Way between Sinnott Lane and Curtis Avenue
Parktown Plaza	1715 Landess Ave Milpitas
Peter D. Gill City Park	Paseo Refugio and Santa Rita
Sinnot Park	Clear Lake and Tahoe
Staples at the Town Center Mall	627 E Calavaras Blvd
Starlite Park	Rudyard and Abbot Ave
Town Center	455 E Calaveras Blvd
VTA Great Mall Station	S Main Street at Great Mall Parkway
VTA Light Rail Station	Tasman Dr and Alder Rd
Weinerschnitzel	1333 S Park Victoria Dr
Yellow Stone Park	Yellowstone east of S Park Victoria

3.5. Past Expenditures

Based on the existing network, an estimate of past expenditures is possible. These estimates are in 2008 dollars and there is an explanation of 2008 per mile costs for the three bikeway classes in Chapter 8 Project Prioritization and Costs. There are 7.89 miles of Class I bike paths, this equals $7,890,000 ($1,000,000 per mile). For on-street facilities, there are 17.89 miles of Class II bike lanes equaling $602,893 ($33,700 per mile) and 8.99 miles of Class III bike routes equaling $203,174 ($22,600 per mile).

3.6. Encouragement and Education Programs

3.6.1. Suggested Routes to School

The City of Milpitas Traffic Engineering Division has a Suggested Routes to School program to help educate students about traffic safety and travel awareness to and from school. As part of this program, the City developed nine maps for the following schools: Burnett, Curtner, Pomeroy, Randall, Rose, Sinnott, Spangler, Weller, and Zanker. These maps provide the best routes for students to walk to school, showing locations of pedestrian paths, traffic lights, crossing guards, and school crosswalks. As part of the existing conditions analysis, the project team performed a survey of the suggested routes to schools. In addition to looking at bicycling facilities along these routes, bicycle parking facilities were inventoried at each of the schools.

Table 3-3 - Schools' Existing Bicycle Parking includes a list of Milpitas schools, the number of bicycle parking locations, and a picture of the existing bicycle parking. Potential improvements are described in Chapter 6.

There is bicycle parking at all of the schools except for Milpitas High School. At the High School, bicyclists park along a chain link fence on the School's boundary with Calera Creek. Zanker Elementary School has a bicycle cage. The cage is made of chain-link fence with a bike rack inside. The cage can add extra protection against vandalism. The intention for the cage is to keep it open in the morning for students to park their bikes, lock it during the day when school is in session, and then reopen at the end of the school day so students can retrieve their bikes. The fieldwork was performed during the middle of the school day and at that time, the cage was unlocked. The remaining schools all have bike parking, however, these are facilities classified as "wheel bender" type racks. This means that the bicycle parking structures only supports the wheel of a bike. Ideally bicycle parking supports not only the wheel but also the frame. This allows the user to lock the frame and the wheel to the bike parking structure and also helps prevent potential damage to the wheel or spokes on a bike. **Figure 3-3 – Preferred Type of Bike Parking** shows an example of bike parking that supports a bike's wheel and frame. More bicycle parking is in Chapter 6 Recommended Improvements and Appendix A Design Guidelines.

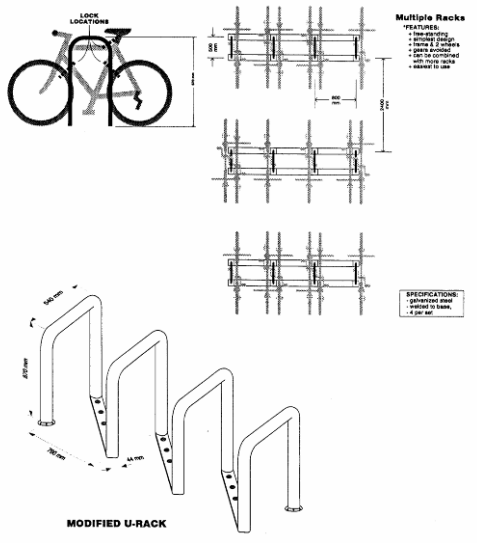

Figure 3-3 – Preferred Type of Bike Parking

Table 3-3 - Schools' Existing Bicycle Parking

School	Bike Parking Spaces	Bicycle Parking
Burnett Elementary School	20	Burnett Elementary School
Curtner Elementary School	50	Curtner Elementary School

School	Bike Parking Spaces	Bicycle Parking
Milpitas High School/ Pomeroy Elementary School/ Thomas Russell School	HS – 0 Pomeroy – 45 (20 are inaccessible) Russell - 45	 Milpitas High School Pomeroy Elementary School
Rancho Middle School/ Sinnott Elementary School	Rancho – 45 Sinnott – 62	 Rancho Middle School Sinnott Elementary School

School	Bicycle Parking Spaces	Bicycle Parking
Randall Elementary School	12	Randall Elementary School
Rose Elementary School	32	Rose Elementary School
Weller Elementary School	15	Waller Elementary School
Zanker Elementary School	25	Zanker Elementary School

3.6.2. Amgen Bike Tour of California

The Amgen Bike Tour of California is a professional cycling race that covers California from the San Francisco Bay Region to Los Angeles. The race is modeled after the Tour de France and is the most popular cycling race held in the United States. The tour route has included Milpitas in the past, bringing top professional cyclists as well as race spectators to the City. In 2008 the race route through Milpitas included Piedmont Road and Calaveras Road.

3.6.3. Primavera Century Ride

The Primavera Century Ride is an amateur bicycle ride through the southern section of the East Bay Hills, just east of Milpitas. The ride begins and ends at James Logan High School in Union City. The route traverses the hills east of Milpitas on Calaveras Road, continuing on Palomeras Road and then reversing its route. Established in 1972, the ride is an annual event.

3.7. Transit Connections

The Valley Transit Authority (VTA) connects Milpitas to the Bay Region. VTA connects Milpitas to the region with shuttles to the near-by City of Fremont, and the Altamont Commuter Express Station in near-by Santa Clara. Additionally, the VTA is in the process of studying the feasibility of bringing the Bay Area Rapid Transit (BART) system through Milpitas to San Jose.

3.7.1. VTA

Milpitas is served by 15 VTA bus lines.[3] The majority of the bus lines connect to the Great Mall of the Bay Area. Milpitas residents can access the Fremont BART Station by three bus lines. The Altamont Commuter Express runs two shuttles to the Great America Station in Santa Clara. The VTA 901 Alum Rock to Santa Teresa light rail line also connects Milpitas to Campbell, Mountain View, and San Jose.

3.7.2. BART

The Bay Area Rapid Transit (BART) is a heavy rail system connecting 43 stations spread throughout the Bay Area. Over the years, BART has increased its accommodations for bicycles. In 2000, BART issued its Bicycle Parking and Access Plan, which sets a goal of increasing bicycle access mode share. Currently, BART allows bicycles on most trains, except those trains traveling during peak commute hours between Oakland and San Francisco.

In 2000, voters approved an extension of the Fremont BART line to Milpitas, San Jose, and Santa Clara. The Milpitas BART Station, along this extension, is planned in conjunction with the Transit Area Specific Plan EIR. This extension would follow the Union Pacific Railroad right-of-way, with stations at the intersection of the Montague Expressway and Capitol Avenue. The Transit Area Specific Plan EIR places increased bicycle mobility and access to transit as a priority.

[3] VTA, City of Milpitas, 2008. <http://www.vta.org/schedules/schedule_milpitas.html>

3.8. Opportunities and Constraints

The following summary of opportunities and constraints are from field work, conversations with City staff, a meeting with the Bicycle and Pedestrian Advisory Committee, and a review of existing planning documents. This list is preliminary and may change with additional public input.

Table 3-4 - Opportunities and Constraints

Opportunities	Constraints
• City is connected to the Bay Trail regional network. • Existing Class II bike lanes on major arterials • Long creek corridors with potential for Class I bike paths along: 1. Penitencia Creek 2. Calera Creek • Long railroad corridors with potential for Class I bike paths. • Midtown redevelopment area presents numerous opportunities for creating bicycle connections between existing facilities and transit area. • Opportunities for Class II bike lanes along some arterials and neighborhood collectors • Opportunities for Class III bike routes in neighborhoods, connecting schools. • Parallel routes to major arterials that have traffic calming could become Class III bicycle boulevards • Precedent for building trails along creeks, including Berryessa and Coyote Creeks • Regional destination, the Great Mall • Multiple transit connections including VTA bus service and light rail, and a future BART station • Neighboring city connections to San Jose via Abel Street and Fremont via Milpitas Boulevard	• Barriers to east-west connections, including: 1. I-880 2. I-680 3. Railroad tracks • Existing east-west bicycle connections along Calaveras Boulevard and Montague Expressway have multiple lanes with high traffic volumes • Many cul-de-sacs, presenting less direct connections within neighborhoods • Highway interchanges are difficult for bicyclists to navigate • Many Class II bike lanes do not meet Caltrans design guidelines • Lack of a grid-like street network or pedestrian cut-throughs increases the distance pedestrians must travel • Potential creek barriers: Coyote Creek, Penitencia Creek, Berryessa Creek

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4. Planning & Policy Context

This chapter provides a summary of planning and policy documents relevant to the development of the Milpitas Bicycle Master Plan Update. Plans and policies are considered relevant if they directly address bicycle facilities, or if they address land-use patterns that affect bicyclists. The Milpitas Bicycle Master Plan Update builds upon and enhances the bicycle related policies already established for the area. The chapter reviews the following:

4.1. Area and Specific Plans

4.2. Citywide Plans and Municipal Code

4.3. Regional Plans

4.1. Area and Specific Plans

This section reviews the area and Specific Plans pertinent to bicycling in Milpitas. The City includes two Specific Plans: the Midtown and Transit Area. These plans incorporate many design guidelines that support bicyclist mobility and connectivity to transit. The Berryessa Creek Trail and Coyote Creek Trail Feasibility Report are also reviewed. These multi-use trails will serve as connectors to destinations throughout Milpitas for bicyclists.

4.1.1. Midtown Specific Plan (2002)

Figure 4-1 – Midtown Specific Plan shows the Midtown Specific Plan project area, adopted March 19th 2002, is roughly bound by I-880 to the west, I-680 to the east, State Route 237 to the North, and the Montague Expressway to the south. The purpose of this plan is to guide development that incorporates a mix of uses that reflects neighborhood considerations in this area. The strategy is to create opportunities for development around transit.

This specific plan calls for accommodating bicyclists and pedestrians by improving street connections and design. These improvements include insuring that streets in new developments are well connected at a pedestrian scale, as well as providing attractive streetscapes. The estimated cost for the bicycle and pedestrian improvements are approximately $6.5 million. **Figure 4-1 – Midtown Specific Plan** shows new bicycle facilities proposed in the Plan and they are also listed below.

- Close the segment of Carlo Street between Calaveras Boulevard Loop and Main Street
- Construct a new pedestrian friendly street between Abel and Main Streets and Serra Way and St. John's Church
- Increase street capacity, where feasible, while minimizing bicyclist-motorist conflicts
- Add trails along the Hetch-Hetchy right-of-way

- Create an interconnected path and sidewalk system that provides bicyclist access to the Great Mall, transit stations, and parks
- Provide secure, weather protected bicycle parking at new residential and retail developments; the design guideline calls for bicycle parking equal to 5 percent of the total number of stalls in multifamily and retail complexes
- Require new commercial development to implement Transportation Demand Strategies that encourage bicycling, including the provision of shower stalls

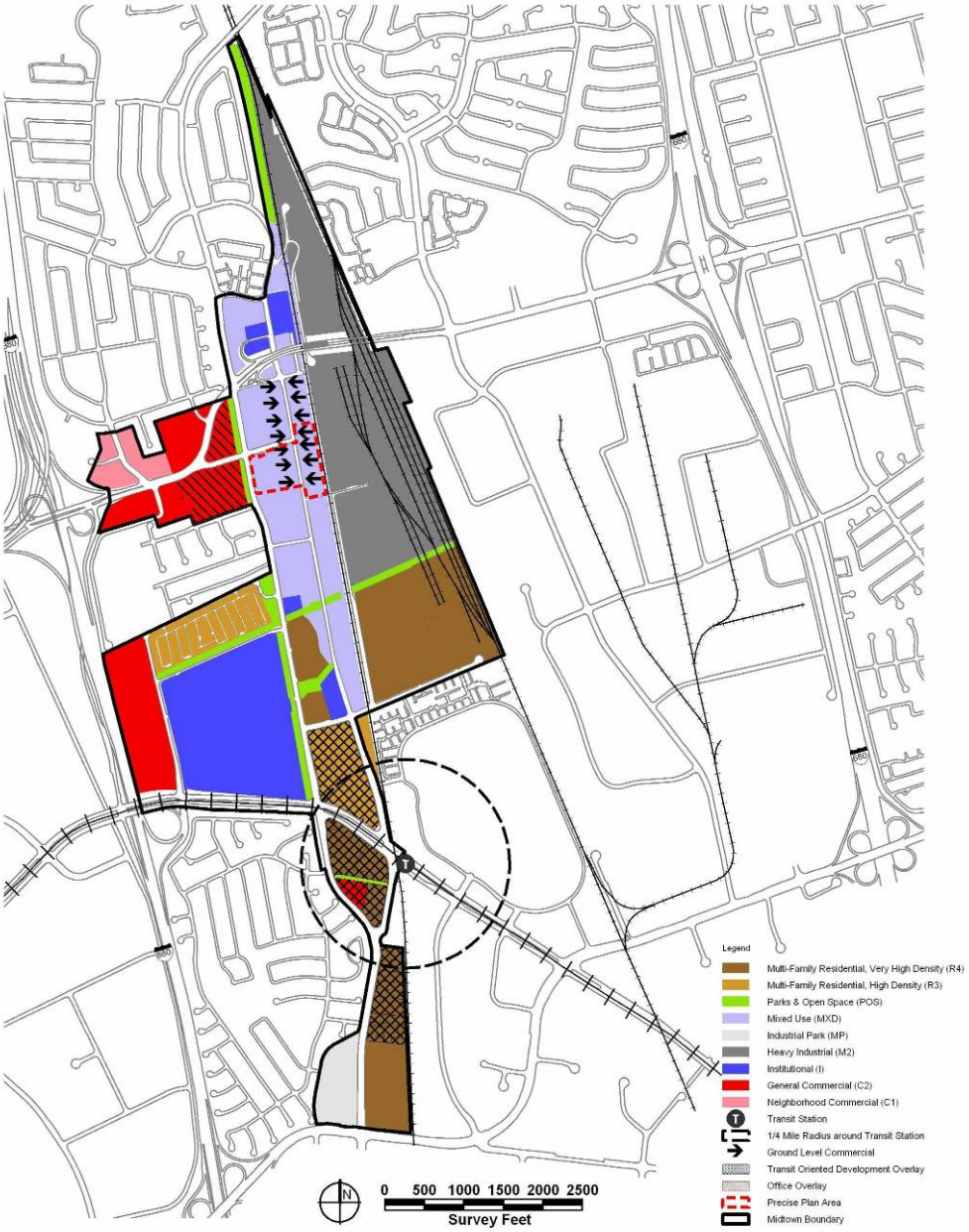

Figure 4-1 – Midtown Specific Plan

The Specific Plan also identifies the barriers to bicycle travel. Though two major highways, I-880, and I-680, and the Union Pacific Railroad (UPRR) line serve the area, they also present obstacles to bicyclists. This plan seeks to mitigate these obstacles with streetscape improvements, traffic calming, and a citywide bicycle network. Opportunities for pedestrian and bicycle connections across the UPRR were explored but found to be infeasible due to constraints from private development and cost but alternate opportunities to provide an east-west connection over the UPRR are provided for within the Transit Area Plan EIR area.

To date, there have been some accomplishments in the Midtown area. These include:

- Carlo Street closure complete in 2006. The City is pursuing the conversion of the Carlo Street on-ramp to eastbound SR237 to an off-ramp instead. The portion of Carlo Street closed in 2006 will remain available as an alternate bike route to North Main Street.
- The City completed the construction of pedestrian and bicycle-focused streetscape improvements on Abel Street in 2007 between Great Mall Parkway and Corning Avenue. Active construction on North Main Street between Weller Lane and Carlo Street for pedestrian and bicycle-focused streetscape improvements were under construction during the preparation of this report.
- The Abel Street Streetscape Phase I completed in 2007 includes new bicycle lanes.
- Through public-private partnerships with development, new parks with trail elements were completed in 2007 throughout Midtown.

4.1.2. Transit Area Specific Plan EIR (2008)

The Transit Area Specific Plan (TASP) EIR, adopted June 3rd 2008, sets out to implement the goals of the Midtown Specific Plan, including development a precise plan for the areas South of Great Mall Parkway. Specifically, this plan calls for continuous pedestrian and bicycle circulation throughout the project area and for the construction of two pedestrian/bicycle bridges over Montague Expressway near Piper Drive to the future BART station and along Penitencia Creek East, another bridge crossing the retained cut of the BART line and rail tracks from Piper Drive to the Great Mall, and one from the Montague VTA Light Rail Station over Capitol Avenue to the future BART station.

The Plan has a series of policies that relate to bicycling in the Transit Study Area as listed in **Table 4-1 – Bicycle Related Transit Area Specific Plan EIR Policies**. These policies call for a bicycle network that connects the area to transit stations. They also include specific recommendations for routes. These routes are included in the Bikeway Plan's recommended network.

Table 4-1 – Bicycle Related Transit Area Specific Plan EIR Policies

Policy 3.21	Provide continuous pedestrian sidewalks and safe bike travel routes throughout the entire Transit Area and within development projects.
Policy 3.22	Private development shall be encouraged to provide direct walking and biking routes to schools and major destinations, such as parks and shopping, through their property.
Policy 3.23	Encourage children to walk or bike to school by expanding existing safe walking and bicycling routes to schools into the Transit Area.
Policy 3.26	Construct pedestrian/bicycle bridges over Montague Expressway to allow safe crossings of this regional roadway with heavy traffic volumes: (1) near Piper Drive, to connect the Light Rail station, BART station, and development sites on the south side with the Great Mall and the neighborhoods north of Montague Expressway; and (2) near the Penitencia Creek East channel to connect schools and neighborhoods north and south of Montague Expressway.
Policy 3.27	Every resident of the Transit Area shall be able to safely walk and bike to the BART and VTA light rail stations. As projects are constructed, make sure that all the routes described below are continuous and designed to be attractive and safe for pedestrians.
Policy 3.28	Provide continuous bicycle circulation through the project site and to adjacent areas by closing existing gaps in bicycle lanes and bicycle routes.
Policy 3.29	A Class III bicycle route shall be created on the internal roadways (from the Milpitas Boulevard Extension/Capitol Avenue intersection to Tarob Court) to provide a continuous bicycle connection between Milpitas Boulevard and the existing bicycle lanes on Lundy Street, as indicated on Figure 3-5 [of the proposed Plan].
Policy 3.30	Maintain pedestrian and biking facilities.
Policy 3.31	Require provision of bicycle and pedestrian facilities such as weather protected bicycle parking, direct and safe access for pedestrians and bicyclists to adjacent bicycle routes and transit stations, showers and lockers for employees at the worksite, secure short-term parking for bicycles, etc.

The creation of interconnected bikeway networks, including multi-use paths, and bicycle parking were used as a measures to mitigate this impact. **Figure 4-2 – Transit Area Specific Plan EIR Pedestrian and Bike Circulation Recommendations** shows these recommended facilities.

The EIR was adopted by City Council in June 2008.

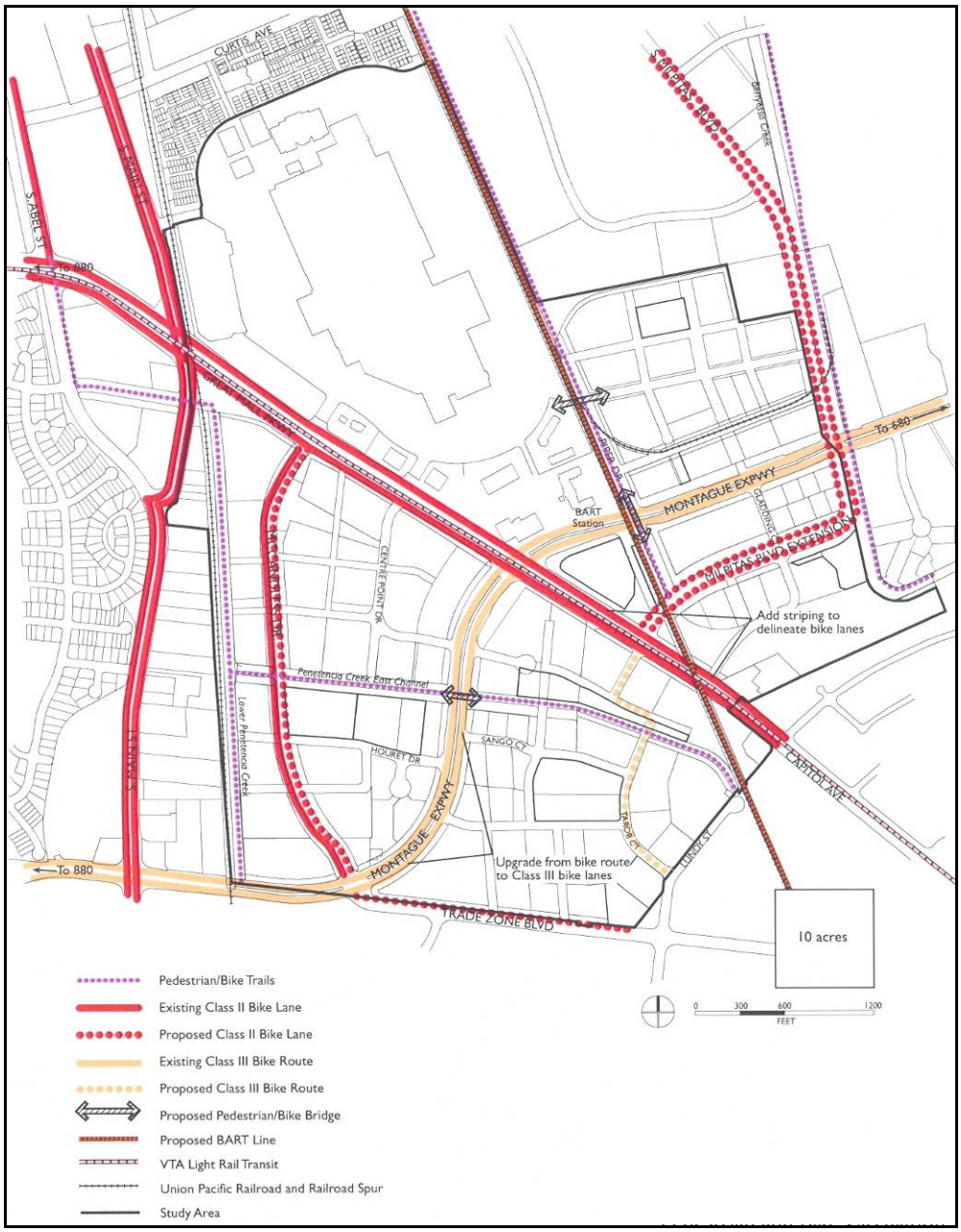

Figure 4-2 – Transit Area Specific Plan EIR Pedestrian and Bike Circulation Recommendations

4.1.3. Berryessa Creek Trail and Coyote Creek Trail Feasibility Report (2001)

In 1994, the Bicycle Transportation Advisory Committee initiated the development of an off-road trail system to complement the City's existing on-street bicycle network. In response to this initiation, the City Council created a Trails Task Force, which included the Bicycle Transportation Advisory Committee, Parks, Recreation, and Cultural Resources and Planning Commissions. In the subsequent years, field visits were conducted, reports developed, and priority trail locations

identified. The Berryessa and Coyote Creeks were identified as the top trail location priorities in the 1997 Trail Master Plan that followed.

This report was issued in May 2001 and determines the feasibility of bicycle and pedestrian paths along these creeks. This report identifies areas along the creeks where trails are not feasible due to streamside erosion. In these areas, on-street bicycle facilities were proposed to ensure a seamless network. All three classes of bikeways were proposed for trail use. Most of the area along the creeks accommodates a Class I bike path. Where a Class I path is not accommodated, Class II and III bikeways are used. Additionally, pedestrian/bicycle bridges were proposed at the creeks' outflow tributaries. Also in the Plan are benefits, environmental impacts, mitigation measures, design guidelines, and costs to implement these trails. These facilities will be incorporated into this plan's recommended bicycle network.

4.2. Citywide Plans and Municipal Code

This section reviews the City of Milpitas' planning documents and municipal code that reference bicyclists, or land-use that affects bicyclists.

4.2.1. General Plan (2002)

The General Plan is the 'roadmap' for future development in the city. This section extracts those city goals that relate to bicyclist mobility. The Land Use and Circulation Elements of the General Plan set guiding principles directly in support of this mobility.

4.2.1.1. Land Use

The guiding principles of the Land Use Element, as related to bicyclist mobility, are creating a park like setting through a network of greenways and trails laced throughout all living areas. Additionally, the element calls to implement the Midtown Specific Plan.

Section 2a.-1-22, Midtown, states that the development of Midtown shall organize a system of bicycle/pedestrian linkages. **Figure 4-3 – City of Milpitas General Plan Land Use Map** shows the designations in the General Plan.

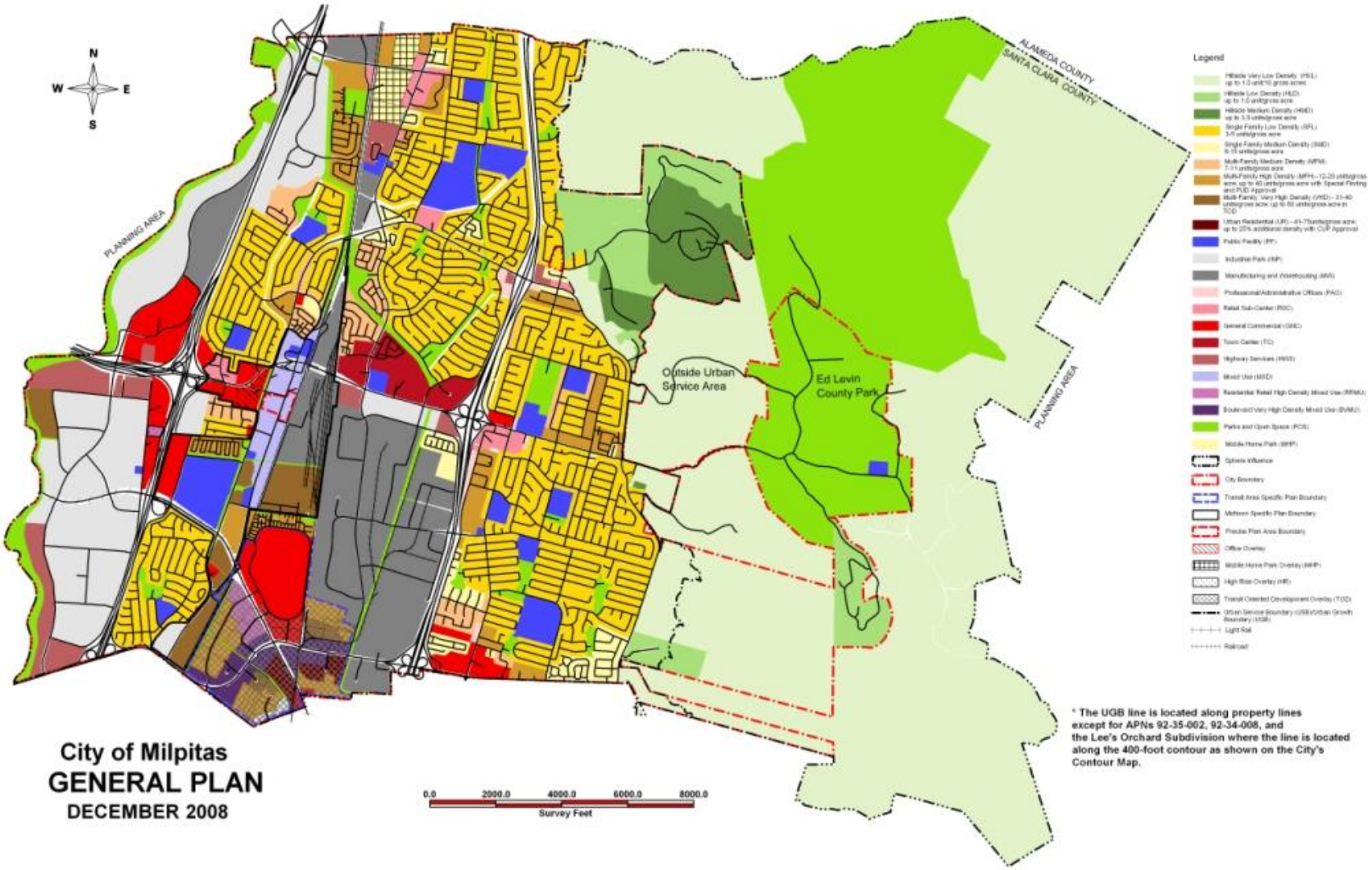

Figure 4-3 – City of Milpitas General Plan Land Use Map

4.2.1.2. Circulation

The guiding principles, as related to bicyclist mobility, of the Circulation Element are:

3.d-G-1 Promote walking and bicycle for transportation and recreation purposes by providing a comprehensive system of sidewalks, bicycle lanes and routes and off-street trail that connects all part of the City.

3.d-G-2 Provide adequate bicycle parking and end-of-trip support facilities for bicycles at centers of public and private activity.

3.d-G-3 Promote intermodal commuting options.

3.d-G-4 Encourage a mode shift to non-motorized transportation by expanding current pedestrian and bicycle facilities.

4.2.2. Municipal Code

The municipal code is a guideline for implementing the General Plan. This section reviews any municipal code that relates directly to bicyclist movement in the context and purpose of this Bicycle Mater Plan Update. Most of the code refers to bicycle parking, defining the amount and type required depending on the land use. Provisions are also stated for end of trip facilities, including showers in new developments.

4.2.2.1. Regulations for Residential Zoning Districts

10-4.06 Off Street Parking Regulations

Bicycle parking: five percent (5%) of automobile stalls required in R4 and R5 zoning.

10.12.06 Transit Oriented Development Overlay District

-1 All developments within the "-TOD" overlay district shall, through the site development permit review process, incorporate measures that would encourage the use of transit, foot and bicycles…

(c) Provision of bicycle facilities and showers--new office and employment uses only.

10.12.02E(4) Additional Development Requirements (Section 12.02 Gateway Office Overlay District)

-Provision of secure and weather protected bicycle parking and showers for employees. (Ord. 38.759 (part), 4/2/02)

4.2.2.2. Off-Street Parking Regulations

10-53.16 Bicycle or Motorcycle Spaces

Any existing or proposed parking facility may utilize, on a substitution basis, on-site parking spaces for bicycle or motorcycle spaces.

(a) Said bicycle spaces shall be raised a minimum of six (6) inches from grade of the adjacent parking facility. (b) One parking space may be omitted for each eight (8) bicycle spaces provided.

(d) Bicycle spaces shall measure at least two (2) feet by seven (7) feet and shall be located in groups of four (4) and shall be of the following three types:

(1) A rack which secures the frame, or

(2) An enclosed bike locker, or

(3) A fenced, covered, locked or guarded bike storage area.

(f) In no instance shall credit for motorcycle or bicycle parking or combination thereof exceed five (5) percent of the total required parking spaces. (Ord. 38.665 (part), 10/29/91: Ord. 38 (part), 3/15/55)

4.2.3. Bikeway Master Plan (2003)

Issued in 2003, the Bikeway Master Plan consolidates all of the bicycle information developed by the Bicycle Transportation Advisory Committee. This plan was further revised to gain consistency with the Midtown Specific Plan. Used in combination with the Trails Master Plan, described below, this plan ensures bicyclist needs are considered in new development, and that existing bicycle facilities are enhanced.

The Bikeway Master Plan highlights bicycle related data and factors influencing bicycling. Of specific interest, this report highlights the low rate of bicycle use for commuting to work in Milpitas, 0.4% in 1990. This report also projects full build out of Milpitas at a date before the City's General Plan projection and, as a result, places priority on setting aside land for bicycle facilities. A listing of proposed bikeway projects is given, including routes to schools.

Figure 4-4 – 2003 Existing and Proposed Bikeways shows bikeways from the 2003 Plan. Because of the curvilinear street pattern in most of the city, these bicycle facilities generally follow main arterial roadways. Some of the facilities proposed in the 2003 Plan have been developed. Those not developed, will be reviewed for inclusion into the Plan Update.

Source: City of Milpitas, Bikeway Master Plan, 2003

Figure 4-4 – 2003 Existing and Proposed Bikeways

4.2.4. Trails Master Plan (1997)

Adopted by the City Council in 1997, this plan reviews the existing trail system, as well as future existing trail locations. As **Figure 4-5 – Milpitas' Proposed Trails** shows, the Plan identifies six miles of trails in Milpitas and 37 miles of proposed trails. These trails are categorized as either regional, local, neighborhood, or on-street, depending on the trails locational significance.

The purpose of this Plan is to offer the city residents an alternative transportation network for non-motorized travel, and in turn, improve their quality of life. To help guide this purpose, the plan identifies ten goals, two of which refer directly to bicyclists. The first goal is to identify potential trails for commuter and recreational use that integrate parks, schools, businesses, and the residential areas. The second goal is to maximize linkages to other non-motorized transportation networks, providing alternative transportation routes for bicyclists (and pedestrians). The plan recommends the incorporation of its findings into the Circulation Element of the City of Milpitas General Plan.

The plan provides a list of prioritized trails. Trail Prioritization was developed based on criteria that rate the transportation and recreation experiences, connectivity to destinations, and the level that trails satisfy City parks and recreation deficiencies. **Table 4-2 – Priority Trails** presents the priority trails list.

Table 4-2 – Priority Trails

Trail Corridor	Total Mileage	Quality of Recreation	Quality of Transportation	Anticipated Level of Use	Connection to Residential Neighborhood	Fills Park/Rec/Open Space Deficiency	Totals	Type of Trail
Berryessa Creek*	4.50	1	3	3	3	2	12	City
Penitencia Creek	4.80	1	3	2	3	2	11	City
Coyote Creek*	5.10	3	3	2	1	2	11	Regional
Wrigley Creek/Union Pacific RR	3.59	0	2	3	3	2	10	City
Hetch-Hetchy Corridor North	2.28	2	1	3	3	0	9	City
Hetch-Hetchy Corridor West	0.70	1	1	2	2	2	8	Neighborhood
Calero Creek	4.07	2	1	2	2	0	7	City
Bay Area Ridge Trail	3.10	3	2	1	1	0	6	Regional

* Trail feasibility report produced in 2001, see section 4.1.3.

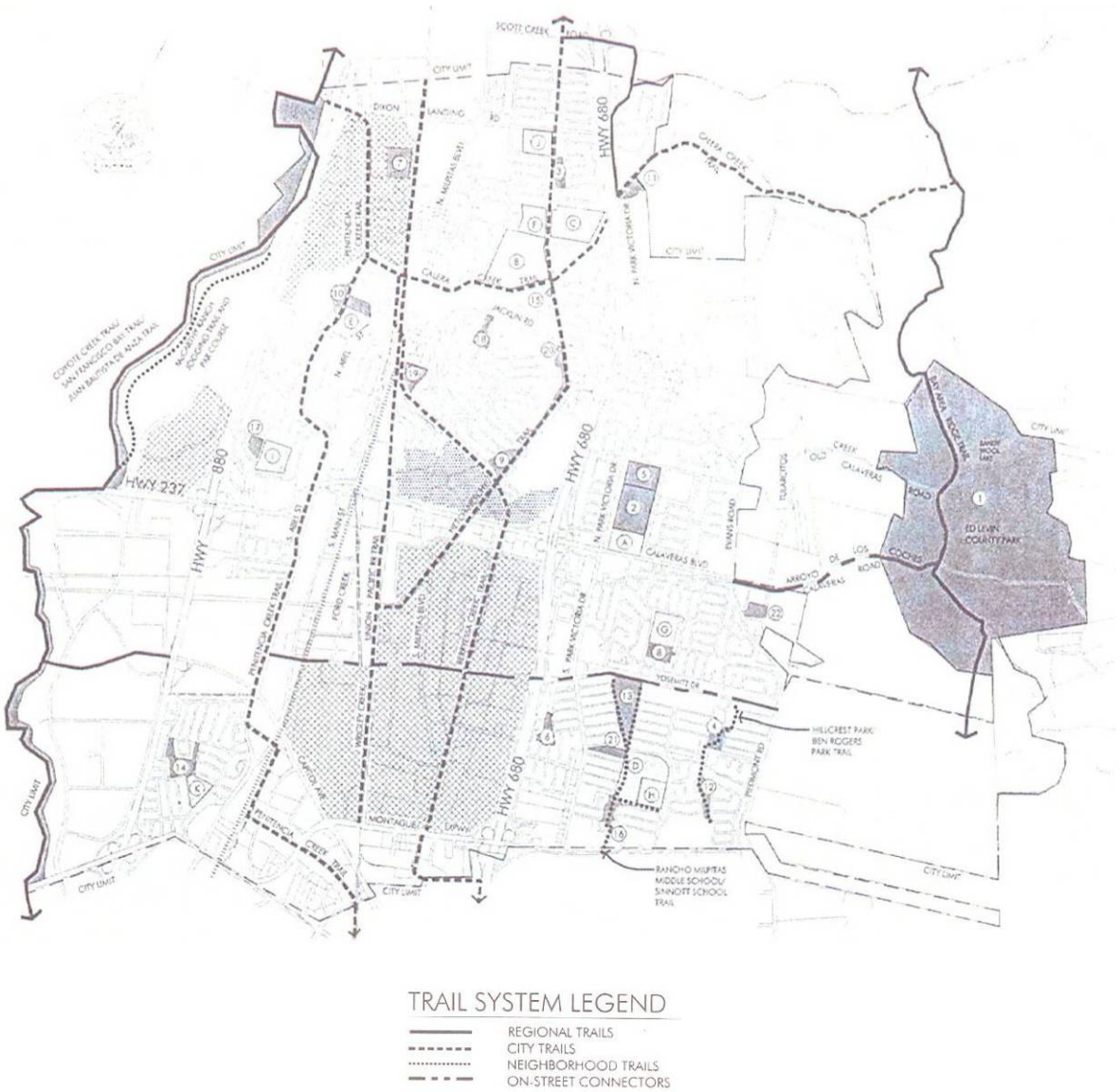

Figure 4-5 – Milpitas' Proposed Trails

4.2.5. Capital Improvement Program (2007-2012)

The Milpitas Capital Improvement Program (CIP) is a comprehensive five-year plan for the purchases required in constructing the City Councils priority capital projects.

The CIP may influence bicyclist mobility, whether directly through the improvement and construction of community projects, parks, or streets, or indirectly, through the construction of sewer and storm drains. The projects (and their costs over the five year plan) that directly affect bicyclist mobility are:

- The Midtown EIR Amendment ($150,000): The Midtown Plan and EIR incorporate many urban design features that enhance or add bicycle facilities.

- Park Improvement Projects ($12,168,272): These projects include the Berryessa Creek Trail and various park renovations.
- Streets Projects ($69,885,088): These projects include intersection improvements, median landscaping, street lighting improvements, and street resurfacing. Street resurfacing and projects with slurry seal improvements are opportunities implement proposed on-street bikeways. These proposed bikeways are discussed in Chapter 6.

4.2.6. Streetscape Master Plan (2000)

The design and landscape of a street influences the propensity of bicyclists to use it. Landscaping, when used appropriately with the adjacent land use, beautifies streets and can make it easier for bicycling. Street trees and shrubbery can act as buffers between roadways and adjacent paths. They also create a sense of enclosure, effectively slowing motor vehicle traffic.

In 2000, Milpitas City Council approved a city-wide streetscape master plan. The purpose of this plan is to provide guidelines and recommendations for streetscape development. This plan was developed with the help of various committees, including the Bicycle Transportation Advisory Committee and is meant to be used in coordination with other city master plans, including the Trails Master Plan and the Midtown Specific Plan.

The plan prioritizes streets for receiving landscape enhancements. Arterial and collector streets are given top priority. Moreover, streets without landscaping are given the most priority, regardless of street capacity. There are special circumstances to these guidelines that are outlined in the plan.

4.3. Regional Plans

Milpitas is located within two regional transportation jurisdictions, the Metropolitan Transportation Commission (MTC) and the Valley Transportation Authority (VTA). Both agencies have bicycle related plans. MTC released its Bicycle Master Plan in 2001 and the VTA incorporated the County of Santa Clara Bicycle Master Plan into its Transportation Plan as a bicycle element. The San Francisco Bay Trail, another regional entity has a proposed segment that links with Milpitas, this as well as an extension of the Bay Area Rapid Transit (BART) through Milpitas are reviewed in this section.

4.3.1. MTC Regional Bicycle Master Plan (2001)

The Metropolitan Transportation Commission (MTC) oversees regional transportation planning across the entire Bay Area region. The MTC adopted its Bicycle Master Plan in 2001, aiming to "ensure that bicycling is a convenient, safe and practical means of transportation throughout the Bay Area for all Bay Area residents." Because MTC is the overarching transportation entity in the Bay Area, its goals and priorities are allocated on the county level. The Valley Transportation Authority, described below, receives some of it direction from MTC's policy goals. Among MTC's goals are:

- Establishing a regional bikeway system
- Integrating bicycles and transit
- Developing regional funding strategies
- Establishing regional support systems

4.3.2. VTA Santa Clara Countywide Bicycle Plan (2000/2008)

As part of the Valley Transportation Plan 2035 (VTP), the VTA adopted the 2008 Santa Clara County Bicycle Master Plan as the bicycle element of the VTP. This element reviews the existing conditions, planning and coordination, priority bicycle projects, and funding and implementation strategies.

VTA also has a detailed set of bicycle parking guidelines for Milpitas. These guidelines recommend the type of bicycle parking facility and how to install it at 31 locations throughout Milpitas.

The 2008 Plan update lists bicycle gaps or barriers present in the County. In Milpitas there are several, due to I-680, I-880, and Coyote Creek.

Table 4-3 – Gap Locations in Santa Clara County – Planned or Potential Across Barrier Connection lists the specific locations. For recommendations, the 2008 Plan states that the Bay Trail Connection between the City of Fremont and McCarthy Boulevard in Milpitas is a priority project.

Table 4-3 - Gap Locations in Santa Clara County - Planned or Potential Across Barrier Connection

Freeways		Railroad Tracks		Creeks	
Name	**Segment Between**	**Name**	**Segment Between**	**Name**	**Segment Between**
680	Scott Creek (Alameda County) and Jacklin	UPRR	Dixon Landing Rd and Abel (alignments splits to SC Train Station & industrial sites)	Coyote Creek	McCarthy at Dixon Landing and Ped Bridge at Alviso Milp.
880	Fremont Blvd (Alameda County) and Dixon Landing	UPRR	Montague Expy and Oakland	Coyote Creek	Tasman / Great Mall Parkway & Montague Expy
880	Dixon Landing and SR 237/Calaveras	UPRR	Calaveras and Montague		

4.3.3. San Francisco Bay Trail

The Bay Trail Plan proposes the development of a paved regional hiking and bicycling trail around the perimeter of San Francisco and San Pablo Bays. Approximately 300 miles of the 500-mile trail have been constructed, either as hiking or bicycling paths or as on-street bicycle lanes or routes. The Bay Trail designates a "spine" for a continuous through-route around the Bay and "spurs" for shorter routes to Bay resources. The goals of the Plan include providing connections to existing park and recreation facilities, creating links to existing and proposed transportation facilities, and preserving the ecological integrity of the Bays and their wetlands. The pedestrian network in this plan will ensure connectivity to the Bay Trail.

As **Figure 4-6 – San Francisco Bay Trail in Milpitas** shows, along the Bay in Milpitas, the Bay Trail includes a completed 2.7 mile segment of shared bicycle/pedestrian off-street path parallel to Coyote Creek from Dixon Landing Road to Highway 237. Currently there is no formal connection from Fremont along Dixon Landing Road however, Fremont has applied for grants to close this gap. San Jose is in the planning stages of the Bay Trail and is considering funding sources for

development. At this time there is no formal connection from the San Jose portion of the Bay Trail to Milpitas, however San Jose is researching funding opportunities.

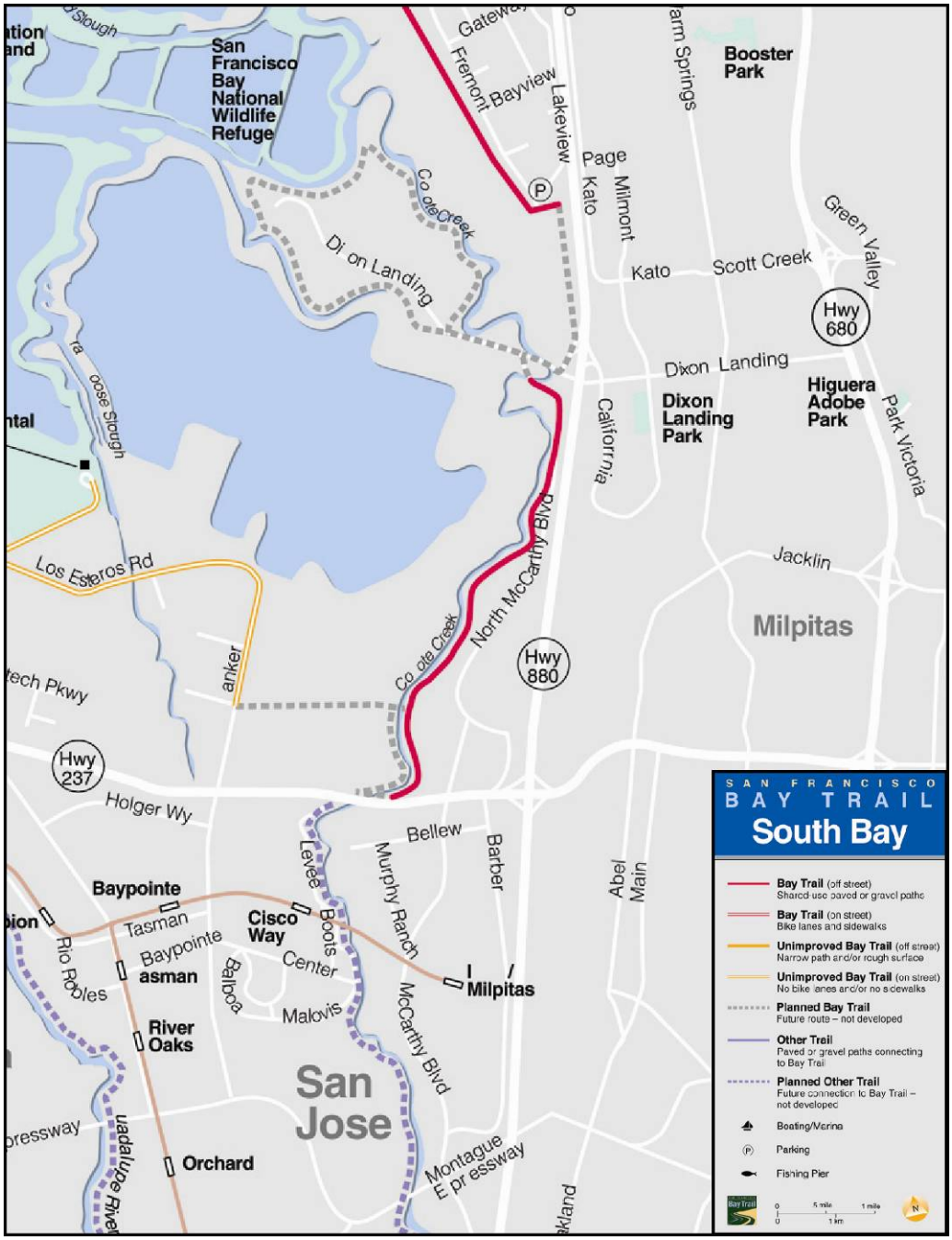

Figure 4-6 – San Francisco Bay Trail in Milpitas

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5. Needs Analysis

This section reviews the needs of bicyclists in the City of Milpitas. It begins with a general summary of the needs and characteristics of bicyclists, and then moves into specific details about Milpitas' biking environments. The section contains information on public outreach conducted as part of this plan and a summary of bicycle related collisions for the last five years and concludes with information about Milpitas' estimated bicycling usage.

5.1. Needs and Types of Bicyclists

It is important to understand the needs and preferences of bicyclists to develop a successful plan. Bicyclists' needs and preferences vary between skill levels and the type of trips they are taking. For example, people who bicycle for recreational purposes may prefer scenic, winding, off-street trails, while bicyclists who ride to work or for errands may prefer more direct on-street bicycle facilities. A bicycle plan should consider these differences when planning a system that serves all user types. The following sections describe the different types of bicyclists, the different reasons for bicycling, and the respective needs for these categories of bicyclists.

5.1.1. Needs of Casual and Experienced Bicyclists

For the purposes of this Plan, bicyclists are separated into two skill levels: casual and experienced. Casual bicyclists include youth and adults who are intermittent riders and include families. Some casual bicyclists, such as youth under the driving age, may be unfamiliar with operating a vehicle on roads and the related laws. Experienced bicyclists include commuters, long-distance road bicyclists, racers, and those who bicycle as a primary means of transportation. A summary of the needs of the different types of bicyclists is provided in the table below.

Table 5-1 - Needs of Bicyclists

Casual Riders	Experienced Riders
Prefer off-street bike paths or bike lanes along low-volume, low-speed streets.	Prefer on-street or bicycle-only facilities to multi-use paths.
May have difficulty gauging traffic and may be unfamiliar with rules of the road. May walk bike across intersections.	Comfortable riding with vehicles on streets. Negotiates streets like a motor vehicle, including "taking the lane" and using left-turn pockets.
May use less direct route to avoid arterials with heavy traffic volumes.	May prefer a more direct route.
May ride on sidewalks and ride the wrong way on streets and sidewalks.	Avoids riding on sidewalks or on multi-use paths. Rides with the flow of traffic on streets.
May ride at speeds comparable to walking, or slightly faster than walking.	Rides at speeds up to 20 mph on flat ground, up to 40 mph on steep descents.
Bicycles shorter distances: up to 2 miles.	May bicycle longer distances, sometimes more than 100 miles.

The casual bicyclist benefits from route markers, multi-use paths, bicycle lanes on low-volume streets, traffic calming, and educational and encouragement programs. Casual bicyclists may also benefit from a connected network of marked routes that lead to parks, schools, shopping areas, and other destinations. To encourage youth to ride, routes must be safe enough for their parents to allow them to ride.

The experienced bicyclist benefits from a connected network of bicycle lanes on high-volume arterial roadways, wider curb lanes, and loop detectors at signals. The experienced bicyclist who is primarily interested in exercise benefits from loop routes that lead back to the point of origin.

5.1.2. Characteristics of Recreational and Utilitarian Bicycle Trips

For the purpose of this Plan, bicycle trips are separated into two trip types: recreational and utilitarian. Recreational trips can range from a 50-mile weekend group rides to a family outing along Coyote Creek, and all levels in between. Utilitarian trips include commuter bicyclists, which are a primary focus of state and federal bicycle funding, as well as bicyclists going to school, shopping or running other errands. **Table 5-2 - Characteristics of Recreational and Utilitarian Trips** describes these differences.

Table 5-2 - Characteristics of Recreational and Utilitarian Trips

Recreational Trips	Utilitarian Trips
Directness of route not as important as visual interest, shade, protection from wind.	Directness of route and connected, continuous facilities more important than visual interest, etc.
Loop trips may be preferred to backtracking.	Trips generally travel from residential to shopping or work areas and back.
Trips may range from under a mile to over 50 miles.	Trips generally are 1-5 miles in length.
Short-term bicycle parking should be provided at recreational sites, parks, trailheads and other recreational activity centers.	Short-term and long-term bicycle parking should be provided at stores, transit stations, schools, workplaces.
Varied topography may be desired, depending on the skill level of the cyclist.	Flat topography is desired.
May be riding in a group.	Often ride alone.
May drive with their bicycles to the starting point of a ride.	Use bicycle as primary transportation mode for the trip; may transfer to public transportation; may or may not have access to a car for the trip.
Trips typically occur on the weekend or on weekdays before morning commute hours or after evening commute hours	Trips typically occur during morning and evening commute hours (commute to school and work). Shopping trips also occur on weekends.
Type of facility varies, depending on the skill level of cyclist.	Generally use on-street facilities, may use pathways if they provide easier access to destinations than on-street facilities.

Recreational bicyclists' needs vary depending on their skill level. Road cyclists out for a 100-mile weekend ride may prefer well-maintained roads with wide shoulders and few intersections, and few stop signs or stop lights. Casual bicyclists out for a family trip may refer a quiet path with adjacent parks, benches, and water fountains.

Utilitarian bicyclists have needs that are more straightforward. Key commuter needs are summarized below.

- Commuter routes should be direct, continuous, and connected.
- Protected intersection crossing locations are needed for safe and efficient bicycle commuting.
- Bicycle commuters must have secure places to store their bicycles at their destinations.
- Bicycle facilities should be provided on arterials.

5.2. Public Outreach and Input

The public outreach process for this plan began with an initial meeting with the City's Bicycle Pedestrian Advisory Commission (BPAC) in May 2008. At the meeting, the Project Team presented the elements of a bicycle plan. A map was also shared that showed existing bicycle facilities in the City. Participants gave input for locations of existing facilities, barriers to bicycling, and areas for improvements.

Additional public outreach for this plan included meetings with the BPAC, a public workshop in October 2008, and a presentation of the Final Plan to City Council. The public workshop took place on October 2nd, 2008. To publicize the workshop, there was a citywide mailing, details for the workshop were posted on the City's website and TV station, and there were two advertisements in the Milpitas Post newspaper. The City received 21 comments at the Workshop and six emails with comments addressed in the Plan. An email distribution list was also formed from Workshop participants. The list was given updates on the Bikeway Master Plan process.

5.3. Bicycle Safety and Collision Analysis

5.3.3. Perceptions of Safety

Safety is a major concern of both existing and potential bicyclists. For those who ride, safety is typically an on-going concern or even a distraction. For those who do not ride, it is one of the most compelling reasons not to ride. In discussing bicycle safety, separating perceived dangers versus actual safety hazards is important.

Bicycle riding on-street is commonly perceived as unsafe because of the exposure of a lightweight, two-wheeled vehicle to heavier and faster moving automobiles, trucks and buses. Actual collision statistics show that bicyclists face only a marginally higher degree of sustaining an injury than a motorist based on numbers of users and miles traveled. Death rates are essentially the same with bicyclists as with motorists. Bicycle-vehicle collisions are much less likely to happen than bicycle-bicycle, bicycle-pedestrian, or collisions caused by physical conditions. The majority of reported bicycle collisions show the bicyclist to be at fault due to not obeying basic traffic laws. These often involve younger bicyclists riding on the wrong side of the road or being hit broadside by a vehicle at an intersection or driveway.

5.3.4. Collision Analysis

Data for reported bicycle collisions in Milpitas was collected from the Statewide Integrated Traffic Records System (SWITRS) for the years 2003-2007, and are presented in **Table 5-3 - Collisions Involving Bicyclists in Milpitas, 2003-2007.** The rate of cyclist collisions has been relatively constant as was the rate of injury. During this time period, there were no collisions which resulted in death. The table also shows the fault as reported in the police reports. Between 2003 and 2006, over half of the reported collisions were the fault of bicyclists. These percentages are considerably higher for bicyclists than motorists.

Table 5-3 - Collisions Involving Bicyclists in Milpitas, 2003-2007

Collisions			Fault		
Year	Involving a Bike	Injuries	Bicyclist	Motorist	Other
2003	23	19	61%	17%	22%
2004	23	20	52%	9%	39%
2005	21	16	59%	27%	14%
2006	23	18	59%	27%	14%
2007	19	22	26%	18%	52%
Total	109	95	257%	98%	-

*Other – No Fault, Not determined, No information, or Not Applicable

Source: Statewide Integrated Traffic Records System, 2003-2007

Figure 5-1 – Bicycle Related Collisions 2003-2007 is a map showing these collisions. Most collisions involving bicyclists occurred along East Calaveras Boulevard, Park Victoria and Jacklin Road. Collisions occurred on every day of the week and were more common on Wednesday and Saturday.

5.4. System Usage

Understanding how many people bike in Milpitas is important in prioritizing where facilities should be improved or constructed, developing a baseline against which to measure success, and as vital information for grant applications. This plan attempts to understand system usage through extrapolating system usage using United States Census data.

A primary data source for estimating biking rates is the United States Census and the American Community Survey. Journey to work data was obtained from the 2006 American Community Survey for Milpitas, as well as Santa Clara County, California, and the United States for comparison. Journey to work data are shown in **Table 5 4 – Milpitas' Journey to Work Data.** As shown, approximately 0.6% of Milpitas journey-to-work trips are on bicycle. This is less than both the state as a whole and Santa Clara County.

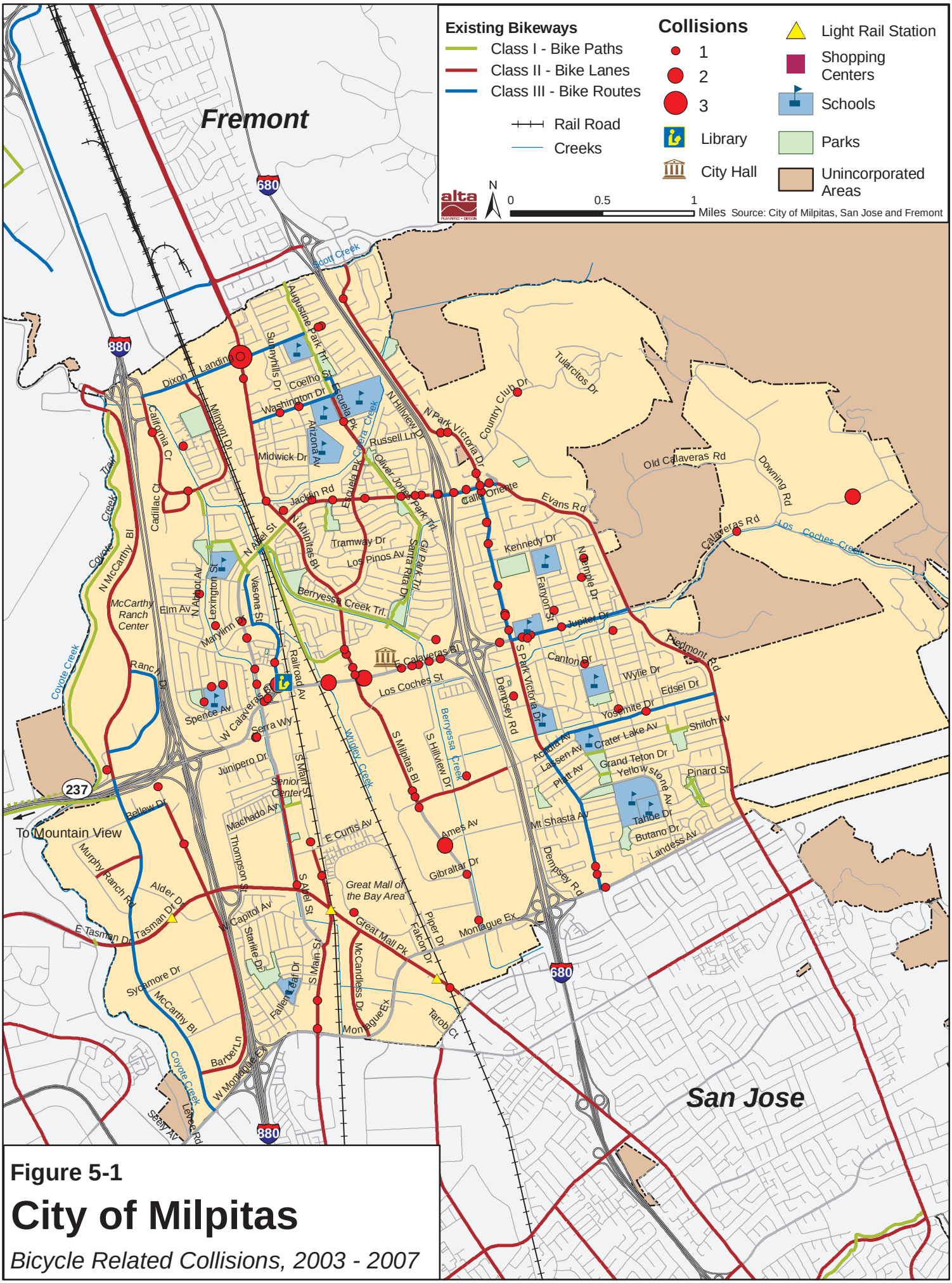


Figure 5-1

City of Milpitas

Bicycle Related Collisions, 2003 - 2007

Table 5-4 – Milpitas' Journey to Work Data

Mode	United States	California	Santa Clara County	Milpitas
Bicycle	0.5%	0.8%	1.0%	0.6%
Drive Alone	76.0%	73.0%	76.9%	82.1%
Carpool	10.7%	12.4%	9.9%	10.5%
Public Transit	4.8%	5.0%	3.7%	2.4%
Walked	2.9%	2.7%	4.4%	0.5%
Other	5.1%	6.1%	3.8%	3.8%

Source: 2006 American Community Survey, Metropolitan Transportation Commission, American Community Survey 2006 Bay Area Data Highlights, 2007.

This data is likely an underestimate of the true amount of biking in the City. Census data does not include the number of people who bicycle for recreation or for utilitarian purposes, students traveling to school, or commuters who travel from outside Milpitas. Census data also reflects only a person's dominant commute mode and does not count non-motorized trips that are part of another trip, for example a person who walks or bicycles to a transit station.

5.4.5. Future Usage and Benefits

A key goal of the Bicycle Master Plan is to maximize the number of local bicycle commuters in order to help reduce traffic congestion, maintain air quality and increase healthy lifestyles. In order to set the framework for these benefits, national statistics and policies are used as a basis for determining the benefits to Milpitas. The latent "need" for bicycle facilities–versus actual bicyclists is difficult to quantify.

For example, bicycling is one of the most popular forms of recreational activity in the U.S., with 46 percent of Americans bicycling for pleasure. This indicates a latent demand for facilities and a potential constituency to push for better facilities.

Mode split refers to the choice of transportation people make whether for work or non-work trips. Currently, the average household in the U.S. generates about 10 vehicle trips per day. Work trips account for less than 30 percent of these trips on average. Using the available 2006 American Community Survey, there are over 2,000 bicycle trips in Milpitas for utilitarian reasons on an average day. **Table 5-5 – Milpitas' Estimated Bicycle Trips and Benefits** provides a detailed summary of existing and future bicycle demand and benefits, including estimated air quality savings from future trips.

Table 5-5 – Milpitas' Estimated Bicycle Trips and Benefits

Current Commuting Statistics		Source
Milpitas Population	64,292	*2006 American Community Survey*
Number of Commuters	54,121	*2006 American Community Survey (Employed persons minus those that work at home)*
Number of Bicycle-to-Work Commuters	333	*2006 American Community Survey*
Bicycle-to-Work Mode Share	0.62%	*Mode share percentage of Bicycle to Work Commuters 2006 American Communnity Survey*
School Children Grades K-8	6,747	*2000 US Census, Children enrolled in school grades 1-8*
Estimated School Bicycle Commuters	101	*Based on 2008 bike counts at schools in Milpitas.. (1.5%)*
Number of College Students	5,330	*2000 US Census*
Estimated College Bicycle Commuters	267	*National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995. Review of bicycle commute share in seven university communities (5%)*
Number of commuters who take Public Transportation	1,295	*2006 American Community Survey*
Estimated number of people who bicycle to transit	65	*Valley Transportation Authority (5% bike to transit)*
Number of commuters who take Santa Clara Transit	1,451	*US Census 2000, Means of travel to work*
Estimated number of people who bicycle to the bus stop	20	*RTD (Denver) Bike-n-Ride Survey, December 1999 (1.4% of total boardings)*
Estimated Total Number of Bicycle Commuters and Utilitarian Riders	786	*Total of bike-to-work, transit, school, college and utilitarian bicycle commuters Does not include recreation.*
Estimated Adjusted Mode Share	1.2%	*Estimated Bicycle Commuters divided by population*
Estimated Current Bicycle Trips		**Source**
Total Daily Bicycle Trips	1,572	*Total bicycle commuters x 2 (for round trips) plus total number of utilitarian bicycle trips*
Reduced Vehicle Trips per Weekday	1,053	*Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children*
Reduced Vehicle Miles per Weekday	4,624	*Assumes average one-way trip travel length of 4.6 miles for adults/college students and 0.5 mile for schoolchildren*
Potential Future Bicycle Commuters		**Source**
Number of workers with commutes nine minutes or less	2,091	*US Census 2000*
Number of workers who already bicycle or walk to work	597	*2006 American Community Survey*
Number of potential bike-to-work commuters	1,494	*Calculated by subtracting number of workers who already bicycle or walk from the number of workers who have commutes 9 minutes or less*

Potential Future Bicycle Commuters		**Source**
Future number of new bike-to-work commuters	299	*Based on capture rate goal of 20% of potential bicycle riders*
Total Future Daily Bicycle Commuters and Utilitarian Riders	1,085	*Current daily bicycle commuters, bike to school and utilitarian riders, plus future bicycle commuters*
Future Total Daily Bicycle Trips	2,169	*Total bicycle commuters x 2 (for round trips)*
Future Reduced Vehicle Trips per Weekday	1,583	*Assumes 73% of bicycle trips replace vehicle trips*
Future Reduced Vehicle Miles per Weekday	7,284	*Assumes average one-way trip travel length of 4.6 miles for adults. Assumes 12 mph average bicycle speed; 23 minute average travel time. Travel time data from NHTS 2001 Trends, Table 26.*
Future Reduced Vehicle Miles per Year	1,930,251	*256 weekdays per year*
Future Air Quality Benefits		
Reduced HC (kg/weekday)	20	*(0.0028 kg/mile)*
Reduced CO (kg/weekday)	152	*(0.0209 kg/mile)*
Reduced NOX (kg/weekday)	10	*(0.00139 kg/mile)*
Reduced CO2 (kg/weekday)	802,019	*(.4155 kg/mile)*
Reduced HC (metric tons/year)	5	*1000 kg per metric ton; 256 weekdays/year*
Reduced CO (metric tons/year)	39	*1000 kg per metric ton; 256 weekdays/year*
Reduced NOX (metric tons/year)	3	*1000 kg per metric ton; 256 weekdays/year*
Reduced CO2 (metric tons/year)	205,3174	*1000 kg per metric ton; 256 weekdays/year*

Emissions rates from EPA report 420-F-00-013 "Emission Facts: Average Annual Emisisons and Fuel Consumption for Passenger Cars and Light Trucks." 2000.

6. Recommended Improvements

This chapter provides a blueprint for the City of Milpitas to accommodate, plan, and promote bicycling. Chapter 6 focuses on infrastructure improvements, including the recommended off-street and on-street bicycle network, bike parking, and maintenance. Chapter 7 focuses on education, encouragement, and enforcement programs. **Figure 6-1 - Proposed Bicycle Network** is citywide map of the proposed bicycle network. Recommended improvements may be subject to further analysis, environmental review, and/or City Council approval.

6.1. Midtown Core Wayfinding Signs

Wayfinding signage is an important part of the bicycle network and implementing a well-planned and attractive system of signage can greatly enhance bikeway facilities. Wayfinding signs can lead bicyclists to and from important land uses, destinations, and transit connections. By leading people to city bikeways that offer convenient and efficient transportation, effective signage can encourage residents and visitors to bicycle and can also help motorists be more aware of bicyclists. Wayfinding can include mile-markers, road identification at undercrossings, and informational kiosks.

A wayfinding signage program is recommended for the Milpitas Midtown Core, proposed sign locations are in **Figure 6-2 - Proposed Wayfinding Plan**. The figure shows sign locations, destinations for each sign, and directions to the destinations. This area of Milpitas is a destination for bicyclists and providing wayfinding signage can help direct them to bikeways and destinations in the area. After the establishment of the wayfinding system in Midtown, it can expand to the transit area and to neighborhoods, helping to link bicyclists with shopping areas, schools, parks, and other destinations. Actual design of proposed wayfinding signs is in Appendix A – Design Guidelines.

6.2. Bicycle-Actuated Traffic Signals

Traffic lights are either set to change at regular intervals or are "actuated" when the signal detects a motor vehicle, bicyclist or pedestrian at the intersection. Systems that can detect bicyclists automatically include video detection systems, in-pavement loop detectors, and infrared sensors. The first two are commonly used for vehicle detection, but are not usually calibrated for bicyclists. The following recommendations are intended to improve bicycle detection at signalized intersections. Design guidelines for bicycle signal detection are in Chapter 9: Design Guidelines.

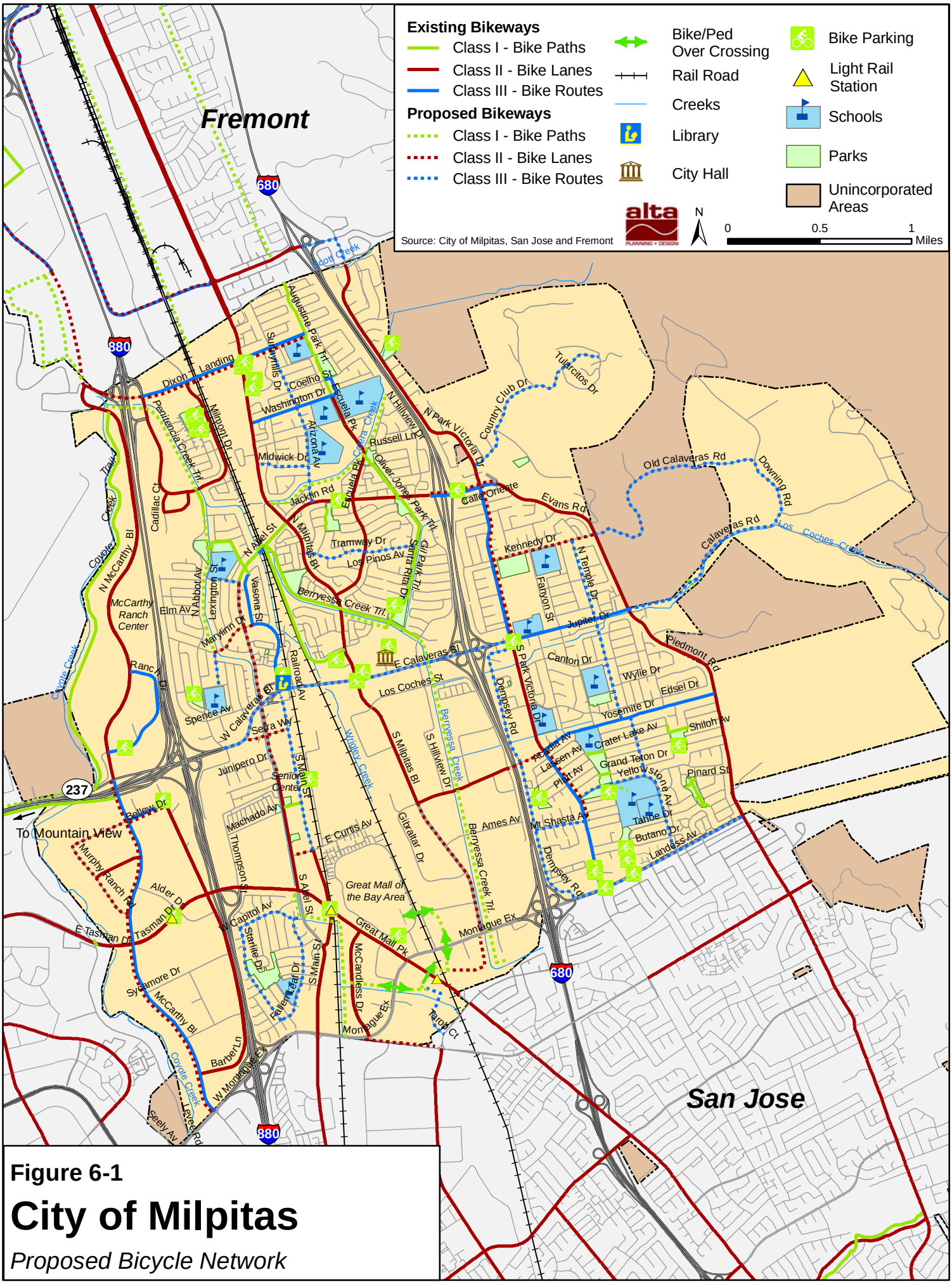


Figure 6-1

City of Milpitas

Proposed Bicycle Network

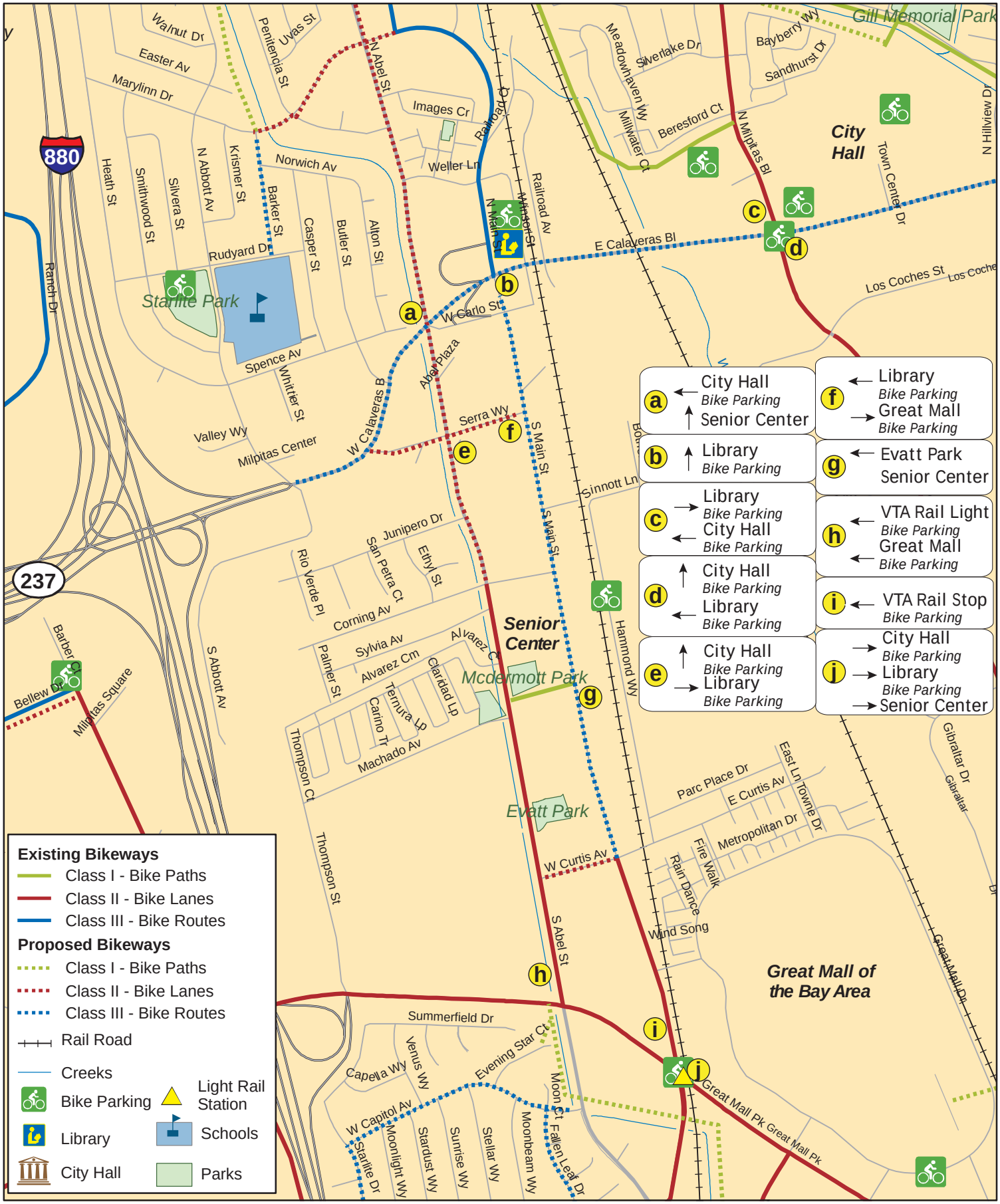


Figure 6-2

City of Milpitas

Proposed Wayfinding Plan

N

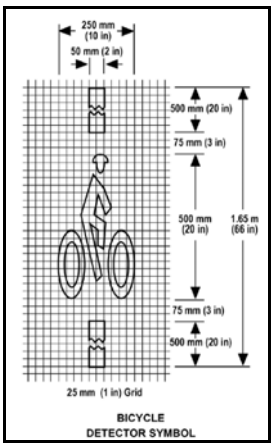
0 500 1,000 Feet

Source: City of Milpitas, San Jose and Fremont

alta PLANNING + DESIGN

6.2.1. Bicycle Detection at Signalized Intersections

As a first priority, Milpitas should install/calibrate detection systems to detect bicyclists at actuated signals along the City's existing and proposed bikeways. The City should make it a policy to install bicycle signal actuation at intersections during roadway construction. If the city uses in-pavement loop detectors, Type D loop detectors are recommended for lead loops in all lanes except bike lanes, where a narrow Type C may be appropriate. The City should ensure that a sufficient all-red phase is programmed into traffic signals so that cyclists can clear the intersection before cross-traffic starts. This is particularly important at single point urban interchanges. Design Guidelines for bicycle signal detection are in Appendix A - A.3.2.2.



CAMUTCD approved bicycle detection marking and signage.

6.2.2. Loop Detector Stencils

As opportunities arise, loop detector stencils should be installed in coordination with striping maintenance or resurfacing projects. Standard bicycle detection markings should be applied to show bicyclists the best place to wait. The best place to wait can be identified during the calibration process by placing a bicycle over the loop detector and marking the location where the bicycle is most strongly detected.

To increase understanding of how to use bicycle loop detectors, the City may want to include information about how to activate a bicycle loop detector in its bicycle educational materials.

6.3. Safe Routes to School Projects

The City of Milpitas has an established Safe Routes to School (SR2S) Program. The City received a grant for SR2S programs in 2008 from Caltrans. To help supplement these programs, the City should work with Milpitas Unified School District to make infrastructure improvements around schools citywide. As part of the Bikeway Master Plan Update, the consultant performed a window survey and developed a series of recommendations to make walking and bicycling easier to schools citywide. **Table 6-1 – SR2S Improvements** shows these recommendations. The recommendations for Class I, II, and III facilities are also included in the Citywide Bicycle Path Network section (6.4) of this plan and prioritized in Chapter 7.

Table 6-1 – SR2S Improvements

School	Potential Improvements
Burnett Elementary School	• Study conversion of N Park Victoria Dr north of Ayers St to Jacklin Rd to a 2-lane road with bike lanes • Convert uncontrolled crosswalks to high-visibility step-ladder crosswalks at:

School	Potential Improvements
	• Kennedy Drive • Fanyon Street • Ellis Avenue/Lynn Avenue
Curtner Elementary School	• Class I bike path along Penitencia Creek • Class III bike routes on Redwood Avenue from N. Abel Street to the school.
Milpitas High School/ Pomeroy Elementary School/ Thomas Russell School	• Class I bike path along Calera Creek • Convert uncontrolled crosswalks to high-visibility step-ladder crosswalks on: • Roger Street • Coelho Street • Escuela Parkway • Bicycle Parking at Milpitas High School
Rancho Middle School/ Sinnott Elementary School	• Provide recommendation to Milpitas Unified School District to consider paving existing informal path on northwest corner of Rancho School grounds • Class III bike route on Yellowstone Avenue • Class III bike route on Sequoia Drive
Randall Elementary School	• Convert uncontrolled crosswalk to high-visibility step-ladder crosswalk on Edsel Drive
Rose Elementary School	• Convert uncontrolled crosswalks to high-visibility step-ladder crosswalks on: • Roswell Drive • South Temple Drive
Spangler Elementary School	• Class I bike path along Penitencia Creek • Convert uncontrolled crosswalk to high-visibility step-ladder crosswalks on Marylinn Drive at Barker Street
Weller Elementary School	• Convert uncontrolled crosswalks to high-

School	Potential Improvements
	visibility step-ladder crosswalks on: • Dixon Road • Boulder Street • Study conversion of Dixon Road east of North Milpitas Boulevard to three lanes with Class II bike lanes
Zanker Elementary School	• Class III bike route surrounding the school on Fallen Leaf Drive, Starlite Drive, and West Capital Avenue • Convert uncontrolled crosswalks to high-visibility step-ladder crosswalks in front of the school

6.4. Citywide Bicycle Path Network

6.4.1. Class I Bike Paths – Expanding the Path Network

The City of Milpitas has a foundation for a citywide path network. The City's long creek corridors provide multiple opportunities for Class I paths. These bikeways are excellent facilities for all levels of bicyclists and serve as for both recreational and utilitarian bicyclists. The path improvements are shown in **Table 6-2 – Proposed Class I Citywide Path Network**. In addition to the improvements listed in the table, two feasibility studies are proposed. The first is a connection from Evening Star Court to the Abel Street/Great Mall Parkway intersection as a potential path improvement. Outreach to PG&E is necessary for this to occur because the facility would travel through its right-of-way. The second improvement needing a feasibility analysis is a trail connection from the bike lane along on the east side of North McCarthy Boulevard to the Coyote Creek Trail.

Table 6-2 – Proposed Class I Citywide Path Network

	Street	Start	Stop	Length
1	Alviso Adobe Historic Park Crossing	Alviso Adobe Historic Parking Lot	Calaveras Rd	0.06
2	Berryessa Creek	Hillview Dr	City Limit	1.86
3	Berryessa Creek (S)	Milpitas Blvd	Pedestrian bridge	0.26
4	Calera Creek Trail	Milpitas Blvd	I-680	0.97
5	Evening Star Court	Evening Star Court	S Abel St	0.04
6	Lower Penitencia Creek	Great Mall Pkwy	City Boundary	0.99
7	Lower Penitencia Creek	San Andreas Dr	N Abel St	0.76
8	Lower Penitencia Creek	N McCarthy Blvd	California Cir	0.77
9	Penitencia Creek East Channel	Montague Crossing	Lower Penitencia Creek	0.20
10	Penitencia Creek East Channel	Montague Crossing	Milpitas Blvd Ext	0.12
11	Rancho School	Yosemite Park	Rancho School	0.08
			Total	6.11

6.4.2. Class I Bike Paths – Transit Area Specific Plan Crossings

There are no existing bikeways in the future BART Station area at Great Mall Parkway and Montague Expressway, making access a challenge for bicyclists. Improving bicycle access to the BART station will greatly increase transit-bicycle links as well as help bicyclists navigate these large roadways. Additionally, improvements at this location will help bicyclists connect with the Great Mall. The Transit Area Specific Plan EIR recommends four bicycle overcrossings in this area and these crossing improvements are also recommended in this Plan. These are a new connection from Gibraltar to Piper Drive that connects to the Great Mall of the Bay Area, a Montague Expressway Crossing from Piper Drive to the future BART station, a Montague Expressway crossing along the proposed Class I Penetencia Creek path, and over the east half of Capitol Avenue connecting the VTA light rail station with the future BART station.

Table 6-3 – Transit Area Specific Plan Crossings lists these locations.

Table 6-3 – Transit Area Specific Plan Crossings

	Street	Start	Stop	Length
1	Montague Expy	Lower Penetencia Creek	Lower Penetencia Creek	0.14
2	Montague Expy	Piper Dr	Future BART Station	0.36
3	Capital Ave	VTA Light Rail	Future BART Station	0.20
4	New Roadway	Great Mall	Piper Dr	0.14
			Total	0.84

6.5. On-Street Bicycle Network

6.5.1. Class II Bike Lanes – Vehicle Lane Reductions

Vehicle lane reductions, or "road diets," refer to projects that remove motor vehicle travel lanes on a roadway and replace them with new or enhanced bicycle or pedestrian facilities. Vehicle lane reductions are possible when the number of travel lanes on a roadway is not warranted by the amount of existing or forecast future traffic. A common type of vehicle lane reduction project is referred to as a "four to three conversion" – in this type of project a roadway that has two lanes of motor vehicle traffic in each direction is reconfigured with one vehicular lane, a dual center turn lane, and bike lanes on both sides.

Dixon Road is an existing four lane roadway with room for a road diet, including bike lanes

In Milpitas, there are two locations (listed in **Table 6-4 – Proposed Class II Bike Lane Vehicle Lane Reductions**) that could benefit from road diets. Both of these streets connect to schools. The first location is Dixon Road east of North. Milpitas Boulevard that connects with Weller Elementary School. Adjacent to Weller Elementary School is the existing Class I path that

connects Escuela Parkway with the City boundary. This segment of roadway is currently four lanes wide with on-street parking on each side. In 2005, the City recorded a daily traffic volume of 3,400 vehicles. This Plan recommends that the City narrow this segment of roadway to one lane in each direction and add Class II bike lanes.

The other location suitable for a vehicle lane reduction is Park Victoria Drive. The section is north of East. Calaveras Boulevard and south of Jacklin Road. The existing Class III connects with Class II bike lanes on either end of Park Victoria Drive. Along this segment there is Cardoza Park, Calaveras Hills High School, and Burnett Elementary School is 0.20 miles away. This segment of Park Victoria has four existing travel lanes and two on-street parking lanes. In 2006, the City recorded a daily traffic volume of 7,740 vehicles. Reducing this to two lanes in either direction with a center turn lane will allow for Class II bike lanes on either side of the street. Traffic studies and community input should be pursued to determine project feasibility.

Table 6-4 – Proposed Class II Bike Lane Vehicle Lane Reductions

	Street	Start	Stop	Length
1	Dixon Road	N Milpitas Blvd	Conway St	0.36
2	N Park Victoria Dr	Jacklin Road	Calaveras Blvd	0.86
			Total	1.22

6.5.2. Class II Bike Lanes - Arterial Connections

Milpitas has an expansive Class II bike lane network on arterial streets and it is growing. This Plan recommends filling in some bike network gaps and connecting existing bike lanes facilities with new bike lanes. Implementing this recommendation is a lower cost than many of the other recommendations because it can occur with the existing pavement maintenance programs including slurry seal and resurfacing projects. When slurry seal is applied, lane striping and bike lanes are painted or repainted. Coordinating this schedule with the proposed bike facilities map will lead to completion of this network. The recommended arterial connection bike lanes are in**Table** 6-5 – Proposed Class II Bike Lane Arterial Connections. Traffic studies and community input should be pursued to determine project feasibility.

Table 6-5 – Proposed Class II Bike Lane Arterial Connections

	Street	Start	Stop	Length
1	Bellew Dr	McCarthy Blvd / Bellew Drive	Barber Ln	0.22
2	Dixon Landing Interchange	SB I-880 on-ramp	California Cir	0.21
3	Dixon Landing West	880 Ramp	Milpitas Blvd	0.57
4	Jacklin Rd	I-680 SBR Ramps	Evans Rd	0.37
5	Kennedy Dr	Evans Rd	N Park Victoria	0.58
6	Marilynn Dr	Barker St	Vasona St	0.28
7	McCarthy Blvd	SR 237	W Montague Expy	1.98
8	Milpitas Blvd Extension	Great Mall Crossing	Montague Expy	0.36
9	N Abel Street	Redwood Ave	Corning Ave	1.07
10	S. Milpitas Blvd	Yosemite Dr	Transit Study Area	0.81
11	S Park Victoria Dr	Mt Shasta Ave	Yosemite Dr	0.44
12	Serra Way	Calaveras Blvd	Main St	0.23

	Street	Start	Stop	Length
13	Trade Zone Boulevard	Montague Expy	City Boundary	0.38
14	Yosemite Dr	S Park Victoria Dr	Sinclair Frontage Rd	0.22
			Total	7.71

6.5.3. Class III Bike Route - Arterial Connections

Class III bike routes can serve as arterial bicycle connections where there is not enough right-of-way for a bicycle lane, but the roadway serves as an important link in the bicycle network. Bike route signs provide delineation of the facility, alerting motorists of bicyclist presence on the shared roadway. In Milpitas, there are two roads outside of the City of Milpitas jurisdiction that are important east-west connectors: Calaveras Boulevard-237 and Montague Expressway (the first a State facility and the second a Santa Clara County road). Dempsey Road and South Main Street are City roads and are north-south connectors. Since there is not enough right-of-way for bike lanes along these links, shared lane markings are recommended. A description of shared lane markings is in Chapter 9's Design Guidelines. **Table 6-6 – Proposed Class III Bike Route Arterial Connections** includes the lengths of these facilities.

Table 6-6 – Proposed Class III Bike Route Arterial Connections

	Street	Start	Stop	Length
1	Calaveras Blvd	S Park Victoria	McCarthy Blvd	1.52
2	Calaveras Blvd	I-880 Ramp	Butler St	0.24
3	Dempsey Rd	S Park Victoria Dr	Montague Expy / Landess Ave	1.61
4	S. Main St	E Curtis Ave	W Calaveras Blvd	0.85
5	Mt Shasta Ave	Dempsey Rd	S Park Victoria	0.28
6	Landess Ave	I-680 Ramp	Piedmont Rd	1.01
			Total	5.51

6.5.4. Class III Bike Routes - Neighborhood Connections

Class III bike routes can serve as bicycle connections through neighborhoods. Generally, neighborhood and some collector streets have relatively low traffic volumes and speeds with one travel lane for each direction and on-street parking. For neighborhood connections, bike routes should have bike route signs and as the wayfinding signage program expands outside of the Midtown Area, they should be installed on bike routes. At pinchpoints, where there is on-street parking, shared-lane markings are recommended. More information about shared-lane markings are found in Appendix A -Design Guidelines. Listed in **Table 6-6 – Proposed Class III Bike Route Neighborhood Connections** are the recommended neighborhood connections.

Table 6-6 – Proposed Class III Bike Route Neighborhood Connections

	Street	Start	Stop	Length
1	Arizona Ave	Manfred St	Jacklin Rd	0.89
2	Barker St	Marylinn Dr	Rudyard Dr	0.17
3	Fallen Leaf Dr	Starlite Dr	W Capitol Ave	0.61
4	Midwick Dr	N Milpitas Blvd	Arizona Ave	0.28

	Street	Start	Stop	Length
5	Milpitas Blvd Extension	City Boundary	Great Mall Crossing	0.34
6	Redwood Ave	Penitencia Creek	N Abel St	0.15
7	Sequoia Dr	Yellowstone Ave	Yosemite Dr	0.33
8	Starlite Dr	W Capitol Ave	Fallen Leaf Dr	0.57
9	Temple Drive	Yosemite Dr	Kennedy Dr	1.01
10	Tramway Dr	Milpitas Blvd	Oliver Jones Trail	0.63
11	W Capitol Ave	Starlite Dr	Fallen Leaf Dr	0.36
12	Yellowstone Ave	S Park Victoria	Landess Ave	0.86
			Total	6.21

6.5.5. Class III Bike Routes – Recreational Rides

Share the Road signs are recommended for the Recreational Ride corridors

The rural roads in the Milpitas hills provide excellent recreational bicycling routes for riders wishing to escape the urban and suburban network. These roads are generally two lane rural roads with narrow shoulders. These routes should be designated as Class III bike routes. Share the Road signs are recommended to help alert motorists of bicycle presence in the area. Though there are only three roads recommended for improvement, they are long lengths compared to other network improvement recommendations. These roads also serve as important connectors to rural recreational routes in the unincorporated county area.

Table 6-7 – Proposed Class III Recreational Rides

	Street	Start	Stop	Length
1	Country Club Drive	N Park Victoria	City Boundary	1.04
2	Old Calaveras Rd/ Downing Rd	Evans Rd	Piedmont Rd	2.67
			Total	3.71

6.6. End of Trip Facilities

6.6.1. Bike Parking Program

Well-designed and ample bicycle parking is a necessary component of a bicycle-friendly community. Bicycle lockers are provided at the two VTA light rail stops and racks are provided at various locations around the City. In general there is a need for additional bicycle parking.

The City of Milpitas should establish a comprehensive bicycle parking program that includes some or all of the components described below:

- Develop a program to install bicycle racks by request. The program should be publicized and requests accepted through postcards, online, and by phone. The City of Oakland has this type of program. [1]
- Install and support citywide electronic locker facilities. BART and VTA are installing these at stations and the City should coordinate with them to have compatible systems. Electronic lockers using smart cards are located at the Milpitas Great Mall Transit Center.
- Install uniform bicycle parking signage and create a bicycle parking map for downtown Milpitas and the Transit Area.
- Work with the Silicon Valley Bicycle Coalition and the City's BPAC to support and publicize bicycle valet services at major events.
- Expand minimum bicycle parking requirements in the Zoning Code. The minimums should require bicycle parking in parking garages, with new or renovated development, and in all public financed buildings and public venues.

Guidelines for the design and placement of bicycle parking, as well as examples of innovative bicycle parking facilities used by Chicago, Portland, Oregon, San Francisco, and other cities are provided in Appendix A: Design Guidelines. The VTA Bicycle Technical Guidelines has extensive detail of bike parking, design options and policies.

Table 6-8 - Recommended Locations for Bicycle Parking

Location	Notes
Public buildings	Short-term parking for visitors at locations such as the library. Bike lockers for employees. .
Major transit stops	Bike lockers are already provided at the VTA light rail stations. Other locations should be evaluated.
Pedestrian oriented commercial districts	Bike racks on sidewalks at regular intervals every block as needed. For example, on Main Street between Calaveras Blvd and Great Mall Parkway
Auto-oriented shopping plazas	Bike racks near front entrances, bike lockers for employees.
Schools	Continued support for bike racks or bike cages located on campus.
Parking Garages	Bicycle racks should be located near the parking attendant. Secure bicycle parking is preferable. As a minimum, Milpitas should include bike parking in all new parking garages.

6.6.2. Encourage Provision of Showers and Lockers

Encouraging employers to provide shower and locker facilities for employees should be a component of all commute and traffic demand management programs. While more extensive accommodations, such as bicycle storage areas and shower and locker facilities are recommended, simpler solutions may be more feasible and are also beneficial. In many cases, providing a secure indoor space to park bicycles is a significant improvement.

[1] Oakland has annual funding to provide a limited number of bike racks each year. http://www.oaklandpw.com/Page127.aspx

Some cities in the United States have requirements for shower and locker facilities in new and reconstructed developments. For example, the model planning ordinance for the City of San Francisco requires that new industrial and commercial developments over 10,000 gross square feet in floor area must provide at least one shower and two clothes lockers. Milpitas should consider requiring bicycle end-of-trip support facilities in new developments as appropriate. End-of-trip facilities could include: secure bicycle parking, drinking fountains, bathrooms, showers, lockers, changing rooms, and signage to direct people to them. Requirements would vary based on the size and type of the proposed development.

6.7. Maintenance

Both on-street and off-street bikeways need regular maintenance. Bicycles are more susceptible than motor vehicles to roadway irregularities such as potholes, broken glass, and loose gravel.

Construction activities in Milpitas present additional maintenance requirements. Construction affects bicyclists through increased roadway wear due to heavy vehicle traffic and increased debris such as sand and gravel from construction equipment. Construction activities may also hinder bicyclists if bikeways are closed off or obstructed due to road maintenance, landscaping or other construction activities. Special accommodations may be made to provide for bicyclists during construction periods.

6.7.1. Maintenance Policies for Bicyclists

The City of Milpitas should evaluate its current street maintenance and repair policies to ensure that they reflect the needs of bicyclists. Specific measures to review include:

Street sweeping. As motor vehicles travel along the roadway, debris is pushed to the outside lanes and shoulder. Debris also collects at the center of intersections. Roads striped with bike lanes or designated as bicycle routes should be swept more frequently than roads without designated bikeways. Street sweeping on these roadways should include removing debris on the shoulder and at intersections.

Minor repairs and improvements. Potholes and cracks along the shoulder of roadways primarily affect bicyclists and should be completed within a timely manner. All repairs should be flush to the existing pavement surface.

Drainage grates. When repaving or maintaining roadways, drainage grates should be inspected to ensure that grate patterns are perpendicular to the road. Replacement of bicycle-unfriendly drainage grates should be standard.

Street resurfacing. When streets are resurfaced, utility covers, grates and other in-street items should be brought up to the new level of pavement. Similarly, the new asphalt should be tapered to meet the gutter edge and provide a smooth transition between the roadway and the gutter pan.

Proactive identification of and response to maintenance needs. The City currently has a 24-hour phone hotline to identify needed repairs to roadways and should consider an online request

system for the same purpose. The City promotes this service as a way of identifying maintenance needs for on-street bikeways and trails.

Regular Maintenance of shared-use paths. Shared-use paths require regular maintenance, including trimming adjacent vegetation, sweeping, plowing, and removing trash and debris. The Milpitas Public Works Department routinely monitors the pathways on a weekly basis checking paving surfaces, debris and litter, signage, and vandalism and schedule maintenance repairs.

Actively coordinate with maintenance workers. Maintenance workers should be involved in the development of bicycle related maintenance policies to ensure that City staff and maintenance workers understand each other's needs and limitations.

Proactively sweep streets after collisions. The City works closely with the Police Department to ensure that streets are swept after automobile collisions.

6.7.2. Minimize Impacts to Bicyclists during Construction

Construction and maintenance activities present challenges for bicyclists. Road construction and maintenance can force bicyclists out into travel lanes with vehicles. To help alleviate impacts to bicyclists during construction and development, several guidelines are recommended. These will help inform bicyclists in advance of these obstacles.

- If feasible, avoid parking construction or maintenance vehicles in bicycle lanes or on designated bicycle routes.
- Provide suitable construction warning signs for any activities that involve work in a designated bikeway. Signage should warn bicyclists well in advance of any location where the bicycle lane is closed for construction or maintenance activities.
- If possible, maintain a coned-off area between the construction zone and vehicle lane for bicycle travel. A 5-foot area is optimal, but the area can be reduced to 3 feet if necessary.
- Provide detour routes for bicyclists around areas undergoing construction.
- Metal plates should be treated so that they are not slippery.
- A temporary reduction of speed limits or work zone speed limit should be considered on roadways where motor vehicles travel 40 mph or greater.

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7. Education, Encouragement, Enforcement, and Evaluation Programs

Bicycle programs can enhance the bicycling experience in Milpitas by supporting physical bicycle facilities. Programs are organized into four categories: education, encouragement, enforcement, and evaluation. This section describes programs best suited for Milpitas and its bicycle system. Also included in each section is whether the program is a high, medium, or low priority for funding and implementation in Milpitas.

7.1. Education Programs

There are many ways to educate the residents of Milpitas about bicycle safety and traffic law. Milpitas can continue to develop its BPAC website to offer more information about safe and legal bicycle travel. It can also continue to develop its Safe Routes to School program, which is the best way to teach children and parents how to bicycle safely in Milpitas, while encouraging them to bicycle to school and work. Currently, the City has Suggested Routes to School Maps, an initial step to a comprehensive Safe Routes to School program.

7.1.1. Safe Routes to School

Safe Routes to School (SR2S) refers to a variety of multi-disciplinary programs aimed at promoting walking and bicycling to school and improving traffic safety around school areas through education, incentives, increased law enforcement, and engineering measures. Safe Routes to School programs typically involve partnerships among municipalities, school districts, community and parent volunteers, and law enforcement agencies. Milpitas' SR2S efforts are a vital component of the Bicycle Master Plan, as they will facilitate the implementation and funding for specific improvements that will help increase bicyclist and pedestrian safety and encourage fewer auto trips.

Older students escorting their peers across the roadway.

The City of Milpitas has taken the initial steps for a Safe Routes to School Program as part of its Clean and Safe Streets Program.

In order to be successful, a SR2S program in Milpitas will need buy-in from individuals and organizations throughout the community. While each individual school will have unique concerns and goals for developing a SR2S program, an organizational strategy that promotes the sharing of ideas between schools can be more effective than several isolated school groups. The key components of an effective SR2S program include champions (individuals at each school who

spearhead their school's organizing effort), stakeholders (a team of people from an individual school), and a task force made up of all the stakeholder teams in the community. The basic components of the proposed SR2S program include: bicycle/pedestrian safety education, encouragement, engineering improvements, and enforcement of traffic laws.

Safe Routes to School is a priority program for the City of Milpitas. The City has already established Safe Routes to School and has received grant funding for non-infrastructure components of the program. There are Suggested Routes to School maps for schools in Milpitas that are available online at http://www.ci.milpitas.ca.gov/citydept/planning/transportation/srts.htm. The City should continue working with schools and individuals seeking to increase safe routes to school as well as continue pursuing funding opportunities. Components of Safe Routes to School are described in the next sections in more detail.

7.1.1.1. Education

Students receiving in-class training

Students receiving on-street bicycle training.

Curriculum programs implemented in schools can teach children the basics of pedestrian and bicycle safety. Classroom educational materials should be presented in a variety of formats (safety videos, printed materials, and classroom activities), and should continually be updated to make use of the most recent educational tools available. Classroom education programs should also be expanded to promote the health and environmental benefits of bicycling and walking. Outside schools, educational materials should be developed for different audiences, including elected officials (describing the benefits of and need for a SR2S program), and parents (proper school drop-off procedures and safety for their children).

Educational programs should be linked with events and incentive programs when appropriate, and students should be included in task force activities, such as mapping locations for improvements. Involving students can serve as an educational tool and can also provide the task force with meaningful data that is useful for prioritizing improvement locations. Educational programs, and especially on-bike training, should be expanded to more schools and for more hours per year. The City of Milpitas will implement these programs with the consent and coordination of area schools.

7.1.1.2. Encouragement

School commute events and frequent commuter contests are used to encourage participation. Programs that may be implemented include a "Walking School Bus Program," which involves parents taking turns walking (or bicycling) with groups of children to school. A good opportunity to kick-off a SR2S program is during International Walk to School Day, held annually in early October. Organized Bike and Walk to School Days should be held monthly or weekly to keep the momentum

going and encourage more children and their parents to walk or bike to school. Prizes or drawings for prizes offered to participants can be used in schools as an incentive. Events related to bicycling and walking should be incorporated into existing curricula when practical. Involving local celebrities or publishing the names of student participants in events can be effective means of encouraging student involvement. Another key to successful events is promotion. Ensuring that parents are aware of events (whether classroom-specific or district-wide) is crucial to gaining maximum student participation.

Other contests and event ideas to encourage bicycling and walking to school include: competitions in which classrooms compete for the highest proportion of students walking or biking to school, themed or seasonal events, and keeping classroom logs of the number of miles biked and walked by children and plotting these distances on a map of California or the U.S.

7.1.1.3. Enforcement

Various techniques are employed to ensure traffic laws are obeyed. The SR2S task force and stakeholder teams should develop priority areas in need of enforcement by the Milpitas Police Department. One alternative to paying for physical police presence is to use innovative signage, such as in-roadway crosswalk signs to alert motorists that children may be crossing, or speed feedback signs that indicate to motorists their current speed. Neighborhood speed watch programs, in which community members borrow a radar device and use it to record the license plate numbers of speeding vehicles are also effective. These measures could be especially effective for schools near higher-volume roadways (e.g., Calaveras Hills High School).

7.1.1.4. Engineering

To provide safe access for children, school sites should have designated non-motorized transportation access points that do not require students to cross in front of drop-off and pickup traffic. Locations identified through the SR2S process should be considered for SR2S grant funding.

Streetscape improvements should ensure adequate sight distance on all access routes, crossings, and intersections. School zone designations for speed limits should be an element of a comprehensive circulation plan that also includes school-based student as well as Police Department crossing guard programs and identification of safe routes for bicycling and walking to school.

7.1.2. Educate City Staff and Construction Crews

Motorist education on the rights of bicyclists is limited. Many motorists mistakenly believe that bicyclists do not have a right to ride in travel lanes and that they should be riding on sidewalks. Education about the rights and responsibilities of bicyclists can include:

- Incorporating bicycle and pedestrian safety into traffic school curriculum.
- Producing a brochure on bicycle and pedestrian safety and laws for public distribution.
- Enforcing traffic laws for bicyclists.
- Providing bicycle and pedestrian planning training for all City planners.

Working with contractors, subcontractors and city maintenance and utility crews to ensure they understand the needs of bicyclists and follow standard procedures when working on or adjacent to roadways and walkways helps new and existing bicyclists.

Education of city staff and construction crews about bicycle planning and bicycle education is a medium priority program. Staff should work internally to organize training and education events working with other city departments. This will help implement bicycle improvements in the Bikeway Master Plan.

7.1.3. One-Stop Bicycle Website

While Milpitas has a website dedicated to its BPAC, it could include the additional information below. The website could provide information about laws, events, maps, tips, and bicycling groups.

The City of Oakland provides detailed information about bicycle and pedestrian projects, hazards, staff, and events @ http://www.oaklandpw.com/page14.aspx

- A list of all bicycling groups, including clubs, racing teams, and advocacy groups
- Information about current projects and how to get involved (e.g., public meetings, comment periods)
- Maps and brochures (links to on-line maps and brochures, where to find in person, and how to request mailed materials)
- Links to laws and statutes relating to bicycling
- Links to all relevant local jurisdictions and their bicycle coordinators
- Information about bicycling events (rides, classes, volunteer opportunities)
- A list of local bike shops, including phone numbers and addresses
- Relevant phone numbers (hotlines for pothole repair, parking enforcement, bike rack installation request, etc.)

A one-stop bicycling website is a relatively easy and inexpensive education program and therefore is a priority for implementation. City staff should work with the IT Department to develop the site. Members of the BPAC could help provide materials for the site.

7.2. Encouragement Programs

Strategies for community involvement in bicycle improvements will be important to ensure broad-based support to help secure financial resources. Involvement by the private sector in raising awareness of the benefits of bicycling can range from small incremental activities by non-profit

groups, to efforts by the largest employers in the City. Targeting these encouragement programs to specific user groups improves their effectiveness. Specific programs are described below.

7.2.1. Bike and Walk to Work/School Day

The City and School District should continue to encourage residents to participate in the annual international Walk-to-School Day held each October. The City and School District could also create a Bike-to-School day. These events raise the profile of bicycling among children. Local Bike-to-Work days can be held annually in conjunction with the school-related events and provide parents with an opportunity to set an example for their children.

May is Bike to Work Month. The City of Milpitas should actively promote this event along with Walk to School Day in October.

Bike to Work Day is usually the third Thursday in May, which is Bike to Work month. The City of Milpitas hosts three bike to work energizer stations in Milpitas. Council members and other prominent individuals in the community could speak and advocate for bicycling as a means to healthier lifestyles, cleaner air, and less automobile congestion.

Encouraging Bike and Walk to Work/School Day is a high priority program. The City is already involved in these annual events so working to make them bigger will help encourage more bicyclists citywide.

7.2.2. Public Use Bicycle Systems

Bicycle rental systems, often referred to as 'bikesharing' or 'PUB – Public Use Bicycles', are gaining popularity in many metropolitan cities across the world. These systems provide bicycles at rental locations throughout a city and then users can return the bicycles to any of the rental locations. The operators are usually private companies that pay for the bicycles and rental stations, in return for advertising rights on public transit vehicles and stations. With the advances in technology, the risk of bicycle theft and malfunction is minimized. Bicycles can be outfitted with GPS tracking devices as well as digital sensors to alert the operator of malfunction. Pay systems are all similar in that they usually require a credit card deposit on a 'smartcard' that allows access to bicycles locked at rental stations.

Metropolitan cities in the US are also developing PUB programs. Washington DC is beginning operation of its SmartBike DC program, operated by ClearChannel. The SmartBike DC bicycles are comfortable commuter bicycles with an upright seating position. An annual membership to use SmartBike DC will cost $40 a year and other prices, for daily and hourly uses, are still under consideration. In addition to Washington DC, ClearChannel and San Francisco are working on an agreement to bring PUBs to the City. As currently proposed, ClearChannel will pay San Francisco's Municipal Transportation Agency $30 million

SmartBike DC will begin operation with 10 stations and 120 bikes, rented with a $40 annual subscription.

over a 20 year contract period for advertising rights on public transit vehicles and at stations in exchange for managing the PUB system.[1]

A PUB is a long-term priority for implementation. As the network expands, in Milpitas and in neighboring jurisdictions this could be a beneficial program to increase bicycling in the region.

7.2.3. Adopt a Bikeway

Community Bikeway adoption programs are similar to the widely-instituted Adopt-a-Highway programs throughout the country. These programs identify local individuals, organizations, or businesses that would be interested in "adopting" a bikeway, walkway, or shared-use path. Adopting a facility would mean that person or group would be responsible for the facility's maintenance either through direct action or as the source of funding for the City's maintenance of that facility. For example, members of a local recreation group may volunteer every other weekend to sweep a bikeway and identify and address larger maintenance needs. Or, a local bike shop may adopt a bikeway by providing funding for the maintenance costs. The managers of an adopted bikeway may be allowed to post their name on bikeway signs throughout the bikeway in order to display their commitment to bicycling in Milpitas.

An Adopt a bikeway program is a long-term priority for implementation. As the network expands, this program will be beneficial to keep bikeways clear and maintained.

7.2.4. Valet Bicycle Parking

When the bicycling population is large, or at bicycle-related events, bicycle parking can be a difficult problem. Improperly parked bicycles can harm vegetation, impede pedestrian travel, and clutter sidewalks. One example of instituting valet bicycle parking is San Francisco's ordinance that requires all major city events to provide bike parking. (www.sfbike.org/?valet). Currently, the BPAC works with the City to organize valet bicycle parking at events.

The San Francisco Bicycle Coalition and Municipal Transportation Agency gives bicycle lights away for daylight savings time. Source: SFBC

Valet Bicycle Parking is a medium priority program. The City has an existing valet program with the BPAC. As the bicycle network expands and bicycle programs expand so should valet parking capacities.

7.2.5. Bicycle Light Campaign

A bicycle light give away is an excellent way to promote bicycle safety. The Silicon Valley Bicycle Coalition and Valley Transportation Agency may coordinate this campaign. Often, light giveaways occur at daylight savings time in the fall when darkness comes earlier.

This is a high priority, especially if there is a need for bike lights. The City should work with the police department to

[1] SFGate, "SF Moving to Catch Up with European Bike-Share Programs," (October 3, 2007).

study whether there is no light bicycling that occurs at night. Based on these results, lights should be ordered and handed to riders in need.

7.3. Enforcement Programs

7.3.1. Path Patrol

Regional path systems are a valuable public resource. The Coyote Creek and Berryessa Trails provide Milpitas with connections to the regional trail system. With many people using the system, it is important to have trained volunteers providing information on how to use the trails properly. Milpitas could coordinate a regional volunteer path patrol system.

The goals of the Path Patrol would include:

- Educating users on sharing the path
- Providing information on area path resources
- Maintaining proper path conditions by informing responsible agencies of hazards
- Acting as a deterrent by having more eyes on the path

Toronto's Trail Ambassadors program provides helpful information for developing this program: www.toronto.ca/parks/trails/trails-ambassadors.htm.

Trail patrol is a medium priority program now and as more paths are developed in the city will become a higher priority. Bicyclists want to feel safe when using paths and this is one-way to help them be more comfortable.

7.3.2. Share the Road / Path

A Share the Road/Path campaign is intended to educate motorists, bicyclists and pedestrians about their legal rights and responsibilities on the road and the need to increase courtesy and cooperation to improve safety. The campaign targets all residents and visitors to a community. The program includes: Share the Road flyers, one targeting bicyclists and one targeting motorists that outline safe and courteous behavior, collision reporting procedures and local bicycling resources and hotlines. Additionally, in conjunction with the Police Department, the program could hold periodic traffic checkpoints during months with high bicycling rates. At checkpoints, motorists, bicyclists and pedestrians are stopped, given a Share the Road flyer and have the opportunity to provide feedback to officers regarding the campaign ideas. Checkpoints could be held along local bikeways and trails or on-street near bicycling destinations such as schools. Public service announcements on

Police officer educating a motorist during a Marin Share the Road Campaign. Source: MCBC

radio and TV could promote the Share the Road campaign, including publicity about the Share the Road checkpoints.

Share the Road/Path program is a medium priority. Like the Path Patrol, as more paths are developed in Milpitas there will be more bicyclists using the paths. This program helps ensure bicyclists share the facilities safely.

7.4. Evaluation Programs

7.4.1. Annual Bicycle Counts and Surveys

Many jurisdictions do not perform regular bicycle user counts. As a result, they do not have a mechanism for tracking ridership trends over time, or for evaluating the impact of projects, policies, and programs. It is recommended that Milpitas perform or supervise annual counts of bicyclists (and pedestrians if desired) according to national practices. The National Bicycle and Pedestrian Documentation Project (www.fhwa.dot.gov/environment/bikeped/study) has developed a recommended methodology, survey and count forms, and reporting forms, and can be modified to serve the needs and interests of individual jurisdictions.

If desired, further bicycle and pedestrian data collection opportunities may be pursued as well, including:

- Include before-and-after bicycle/pedestrian/vehicle data collection on priority roadway projects
- Insert bicycle/pedestrian survey questions into any existing travel mode or city audit survey instrument
- Require counting of bicyclists/pedestrians in all traffic studies
- Purchase National Household Travel Survey add-on

Counts and surveys are a high priority program. Results of this program are an excellent resource for grants, reporting to the public, and validating bicycle expenditures.

7.4.2. Bicycle Facility Audits

Bicycle facilities deteriorate over time and do not function as well as when they were originally installed. Bicycle related signage and striping should be audited on an annual basis to evaluate their function and condition. Bicycle parking should be audited on whether enough parking spaces are provided and whether the level of security is sufficient. Some locations, such as transit stations, may warrant bicycle lockers for bicyclists who park for long time periods. Other locations, such as restaurants, malls, and movie theaters may only need bicycle racks. Auditing could be coordinated with bicycle counts and surveys, making efficient use of time spent in the field while gathering input from bicyclists about existing hazards.

Bicycle facility audits are a low priority. As the bicycle network expands in Milpitas it could become more important.

8. Project Prioritization & Costs

8.1. Project Prioritization

The intent of ranking projects is to create a prioritized list of bicycle projects for construction. As projects are constructed, lower ranked projects move up the list. The project list and individual projects outlined in Milpitas Bicycle Plan are flexible concepts that serve as implementation guidelines. The high-priority project list, and perhaps the overall system and segments themselves, may change over time as a result of changing bicycling patterns, land use patterns, implementation constraints and opportunities, and the development of other transportation system facilities Milpitas staff, in conjunction with the BPAC, should review the project list at regular intervals to ensure that it reflects the most current priorities, needs, and opportunities for implementing the bicycle network in a logical and efficient manner.

Ranking criteria used for this plan include safety, safe routes to school, regional connectivity, safe routes to transit, access to parks and public buildings, and access to existing bikeways. The ranking criteria are described in **Table 8-1 – Project Ranking Criteria**. The overall score of a project is the sum of individual criteria. Projects are placed into three phasing groups: Tier 1, Tier 2 and Tier 3.

- >11 Points: Tier 1 projects are the highest potential bicycle projects and intended for near-term project implementation within 1-5 years. Detailed cost estimates for these projects are in Appendix B
- 7.75-11 Points: Tier 2 projects are intended for development within 6-10 years.
- <7.75 Points: Tier 3 projects are projects that are not currently ready to be implemented, but are included as long-term potential bicycle-specific projects over the next 11-20 years.

Table 8-2 – 51 Prioritized Projects by Tier is a list of projects prioritized into the three Tiers.

Table 8-1 – Project Ranking Criteria

Criteria	Description	Maximum Score
Safe Routes to School	This scoring is based on the density of schools within ¼ mile of the proposed bikeway. Projects with more schools score higher.	5
Safe Routes to Transit	Scoring for this criteria is based on the density of VTA (bus and light rail) stops within ¼ mile of a recommended bikeway. More transit stops equal a higher score.	4
Community Amenities	Parks and public buildings including the library and city hall are bicycle attractors. Scoring is based on the number of amenities within a ¼ mile of the proposed bikeway with more attractors equaling higher scores.	4
Bicycle Connectivity	Proposed bikeways and their connections to existing bikeways are evaluated in this criteria. The more existing bikeways connections, the higher the score.	4
Safety	This ranking is based on SWITRS data identifying corridors with high incidents of bicycle and vehicle collisions. Proposed bikeways along streets with high frequencies of accidents have greater scores. In many cases, these collisions are not the result of motorists' error, so this criterion has the lowest maximum score in the prioritization evaluation.	3
	Maximum Score	*20*

Table 8-2 – 51 Prioritized Projects by Tier

Numeric Rank	Project Name	Project Type	Class	Rank	Safe Routes to School Point Score	Safe Routes to Transit Point Score	Community Amenities Point Score	Bicycle Connectivity Point Score	Safety Point Score	Total Score
1	N Abel Street	Arterial Connection	II	1	3.33	4.00	4.00	4.00	3.00	18.33
2	Arizona Ave	Neighborhood Connection	III	1	5.00	4.00	4.00	2.00	3.00	18.00
3	N Park Victoria Dr	Vehicle Lane Reduction	II	1	1.67	4.00	4.00	4.00	3.00	16.67
4	Calaveras Blvd	Route Arterial Connection	III	1	3.33	4.00	4.00	2.00	3.00	16.33
5	Temple Drive	Neighborhood Connection	III	1	5.00	4.00	2.00	2.00	3.00	16.00
6	Sequoia Dr	Neighborhood Connection	III	1	5.00	3.00	4.00	2.00	1.50	15.50
7	Dempsey Rd	Route Arterial Connection	III	1	3.33	4.00	3.00	2.00	3.00	15.33
8	S Park Victoria Dr	Arterial Connection	II	1	3.33	3.00	4.00	4.00	0.75	15.08
9	Landess Ave	Route Arterial Connection	III	1	1.67	4.00	3.00	4.00	2.25	14.92
10	Calera Creek Trail	Path Network	I	1	3.33	3.00	4.00	2.00	2.25	14.58
11	Yellowstone Ave	Neighborhood Connection	III	1	3.33	4.00	4.00	2.00	0.75	14.08
12	Berryessa Crk	Path Network	I	1	0.00	3.00	3.00	4.00	3.00	13.00
13	Jacklin Rd	Arterial Connection	II	1	0.00	2.00	4.00	4.00	3.00	13.00
14	S Main St	Route Arterial Connection	III	1	0.00	4.00	2.00	4.00	3.00	13.00
15	Berryessa Crk (S)*	Path Network	I	1	0.00	2.00	3.00	4.00	1.50	10.50
16	Dixon Rd	Vehicle Lane Reduction	II	1	1.67	2.00	2.00	4.00	2.25	11.92
17	Kennedy Dr	Arterial Connection	II	2	1.67	1.00	2.00	4.00	2.25	10.92
18	Tramway Dr	Neighborhood Connection	III	2	0.00	2.00	4.00	4.00	0.75	10.75
19	Yosemite Dr	Arterial Connection	II	2	1.67	2.00	2.00	4.00	0.75	10.42
20	Dixon Landing Road	Arterial Connection	II	2	0.00	2.00	2.00	4.00	2.25	10.25
21	Murphy Ranch Road	Part of an approved project	II	2	0.00	4.00	1.00	4.00	0.75	9.75

Numeric Rank	Project Name	Project Type	Class	Rank	Safe Routes to School Point Score	Safe Routes to Transit Point Score	Community Amenities Point Score	Bicycle Connectivity Point Score	Safety Point Score	Total Score
22	Lower Penitencia Crk	Path Network	I	2	1.67	1.00	2.00	2.00	3.00	9.67
23	Lower Penitencia Crk	Path Network	I	2	0.00	4.00	1.00	2.00	2.25	9.25
24	Fallen Leaf Dr	Neighborhood Connection	III	2	1.67	4.00	2.00	0.00	1.50	9.17
25	Rancho School	Path Network	I	2	3.33	2.00	3.00	0.00	0.75	9.08
26	Country Club Drive	Recreational Ride	III	2	0.00	1.00	3.00	2.00	3.00	9.00
27	Midwick Dr	Neighborhood Connection	III	2	1.67	2.00	1.00	2.00	2.25	8.92
28	Calaveras Blvd	Route Arterial Connection	III	2	1.67	2.00	2.00	0.00	3.00	8.67
29	Bellew Dr	Arterial Connection	II	2	0.00	2.00	1.00	4.00	1.50	8.50
30	McCarthy Blvd	Arterial Connection	II	2	0.00	4.00	1.00	2.00	1.50	8.50
31	Lower Penitencia Crk	Path Network	I	2	0.00	1.00	2.00	4.00	1.50	8.50
32	Serra Way	Arterial Connection	II	2	0.00	3.00	1.00	2.00	2.25	8.25
33	Redwood Ave	Neighborhood Connection	III	2	1.67	1.00	2.00	2.00	1.50	8.17
34	Mt Shasta Ave	Route Arterial Connection	III	2	0.00	1.00	4.00	2.00	0.75	7.75
35	Barker St	Neighborhood Connection	III	3	1.67	1.00	2.00	0.00	3.00	7.67
36	Old Calaveras Rd/ Downing Rd	Recreational Ride	III	3	0.00	1.00	1.00	4.00	1.50	7.50
37	Marilynn Dr	Arterial Connection	II	3	0.00	1.00	2.00	2.00	2.25	7.25
38	S. Milpitas Blvd	Arterial Connection	II	3	0.00	2.00	1.00	2.00	2.25	7.25
39	Dixon Landing Interchange	Arterial Connection	II	3	0.00	1.00	1.00	4.00	0.75	6.75
40	Milpitas Blvd Ext.	Arterial Connection	II	3	0.00	2.00	1.00	2.00	1.50	6.50
41	Starlite Dr	Neighborhood Connection	III	3	1.67	1.00	2.00	0.00	1.50	6.17
42	Montague Expy/ Penitencia Crk	Crossing Transit Area	I	3	0.00	3.00	1.00	0.00	0.75	4.75

Numeric Rank	Project Name	Project Type	Class	Rank	Safe Routes to School Point Score	Safe Routes to Transit Point Score	Community Amenities Point Score	Bicycle Connectivity Point Score	Safety Point Score	Total Score
43	Penitencia Crk East Channel	Path Network	I	3	0.00	3.00	1.00	0.00	0.75	4.75
44	Trade Zone Boulevard	Arterial Connection	II	3	0.00	1.00	1.00	2.00	0.75	4.75
45	W Capitol Ave	Neighborhood Connection	III	3	0.00	3.00	1.00	0.00	0.75	4.75
46	Milpitas Blvd Ext.	Neighborhood Connection	III	3	0.00	2.00	1.00	0.00	0.75	3.75
47	Penitencia Crk East Channel	Path Network	I	3	0.00	2.00	1.00	0.00	0.75	3.75
48	Montague Expy /Piper Dr	Crossing Transit Area	I	3	0.00	2.00	1.00	0.00	0.75	3.75
49	Capital Avenue	Crossing Transit Area	I	3	0.00	1.00	1.00	0.00	1.50	3.50
50	Alviso Adobe Park Crossing	Path Network	I	3	0.00	1.00	1.00	0.00	0.75	2.75
51	The Great Mall /New Roadway	Crossing Transit Area	I	3	0.00	1.00	1.00	0.00	0.75	2.75

*Project 14 has a lower total score but serves as a substitute to the Calaveras Boulevard/Milpitas Boulevard intersection. Connecting through this route would score 14th with the criteria.

8.2. Project Costs

This section lists cost estimates for recommended engineering bikeway projects and maintenance activities.

8.2.1. Engineering

A citywide network of bicycle facilities was developed using input from city staff and public input during the development of this plan. The final recommended network sets up a system of bikeways that are approximately 1/4 mile apart in the city. This system includes all three classes of bikeways.

After developing the proposed bicycle network, detailed cost estimates were developed for the 16 Tier 1 priority projects. Cost estimates for the Tier 1 priority projects are in **Table 8-3 – Tier 1 Cost Estimates**. More detailed costs estimates for these projects are in Appendix B.

Table 8-3 - Tier 1 Cost Estimates

Numeric Rank	Project Name	Project Type	Bike Class	Cost
1	N Abel Street	Arterial Connection	II	$67,764
2	Arizona Ave	Neighborhood Connection	III	$30,483
3	N Park Victoria Dr	Vehicle Lane Reduction	II	$124,946
4	Calaveras Blvd	Route Arterial Connection	III	$32,020
5	Temple Drive	Neighborhood Connection	III	$26,897
6	Sequoia Dr	Neighborhood Connection	III	$9,563
7	Dempsey Rd	Route Arterial Connection	III	$46,622
8	S Park Victoria Dr	Arterial Connection	II	$28,410
9	Landess Ave	Route Arterial Connection	III	$8,539
10	Calera Creek Trail	Path Network	I	$930,466
11	Yellowstone Ave	Neighborhood Connection	III	$26,299
12	Berryessa Crk	Path Network	I	$1,486,807
13	Jacklin Rd	Arterial Connection	II	$21,477
14	S Main St	Route Arterial Connection	III	$16,138
15	Berryessa Crk (S)*	Path Network	I	$207,496
16	Dixon Rd	Vehicle Lane Reduction	II	$51,852
			Total Cost	*$3,115,779.00*

Based on the engineering costs for these 16 Tier 1 projects, planning level cost estimates were developed for Tier 2 and Tier 3 bikeways per mile. These costs per mile and the specific designs that are assumed for each of the three classes are in **Table 8-4 - Bicycle Facility Types and Costs Used for Tier 2 & Tier 3 Cost Estimates**. Project-specific factors such as grading, landscaping, intersection modification, right-of-way acquisition, and bridge construction may increase the actual cost of construction. These project specific cost factors are not included in all project specific cost estimates resulting in an unkown margin of error. Project costs for some segments may be

significantly greater. **Table 8-5 – Tier 2 & Tier 3 Cost Estimates** provides cost estimates for the remainder of bikeway projects based on the costs in Table 8-4.

Table 8-4 - Bicycle Facility Types and Costs Used for Tier 2 & Tier 3 Cost Estimates

Bicycle Facility Type	Description	Cost Estimate Per Mile
Class I – Bicycle Path	Ten foot paved shared-use path with two foot shoulders and signage.	$1,000,000
Class II – Bicycle Lanes	Minimum 5' bike lanes striped on roadway with bicycle detector symbols at intersections and installation of bike lane signage. For road diets, motor vehicle ADT is low enough to eliminate two motor vehicle lanes and stripe bike lanes with signage (both road diets are Tier 1 projects).	$62,400
Class III – Bicycle Route	Install wayfinding signs and bike route signs along roadway and pavement stencils in roadway indicating to motorists and bicyclists where bicyclists are expected to ride.	$22,100

Table 8-5 – Tier 2 & Tier 3 Cost Estimates

#	Project Name	Project Type	Bike Class	Cost
17	Kennedy Dr	Arterial Connection	II	$36,210
18	Tramway Dr	Neighborhood Connection	III	$14,000
19	Yosemite Dr	Arterial Connection	II	$14,000
20	Dixon Landing Road	Arterial Connection	II	$35,570
21	Murphy Ranch Road	Future part of an approved development project	II	-
22	Lower Penitencia Creek	Path Network	I	$757,160
23	Lower Penitencia Creek	Path Network	I	$991,760
24	Fallen Leaf Dr	Neighborhood Connection	III	$13,430
25	Rancho School	Path Network	I	$83,650
26	Country Club Drive	Recreational Ride	III	$23,080
27	Midwick Dr	Neighborhood Connection	III	$6,210
28	Calaveras Blvd	Route Arterial Connection	III	$5,240
29	Bellew Dr	Arterial Connection	II	$14,000
30	McCarthy Bike Lane	Arterial Connection	II	$123,560
31	Lower Penitencia Creek	Path Network	I	$766,290
32	Serra Way	Arterial Connection	II	$14,260
33	Redwood Ave	Neighborhood Connection	III	$3,380
34	Mt Shasta Ave	Route Arterial Connection	III	$6,100
35	Barker St	Neighborhood Connection	III	$3,820
36	Old Calaveras Rd/Downing Rd	Recreational Ride	III	$58,800
37	Marilynn Dr	Arterial Connection	II	$17,200
38	S. Milpitas Blvd	Arterial Connection	II	$50,290
39	Dixon Landing Interchange	Arterial Connection	II	$12,840

#	Project Name	Project Type	Bike Class	Cost
40	Milpitas Blvd Extension	Arterial Connection	II	$22,170
41	Starlite Dr	Neighborhood Connection	III	$12,630
42	Montague Expy/Penitencia Crk	Crossing Transit Area	I	$5,000,000
43	Penitencia Creek East Channel	Path Network	I	$202,020
44	Trade Zone Boulevard	Arterial Connection	II	$23,590
45	W Capitol Ave	Neighborhood Connection	III	$8,040
46	Milpitas Blvd Extension	Neighborhood Connection	III	$7,490
47	Penitencia Creek East Channel	Path Network	I	$123,120
48	Montague Expy/Piper Dr	Crossing Transit Area	I	$5,000,000
49	Capital Avenue	Crossing Transit Area	I	$5,000,000
50	Alviso Adobe Historic Park Crossing	Path Network	I	$57,220
51	The Great Mall/New Roadway	Crossing Transit Area	I	$5,000,000
			Total Cost	*$23,507,130*

Before constructing recommended facilities, additional field work will be required to verify conditions. These include but are not limited to: roadway widths, travel lanes, actual motor vehicle speeds, motor vehicle volumes and speeds, bicycle and motor vehicle travel patterns and conflicts, signal timing and actuation, and pavement conditions. Final bikeway treatments should be selected based on verified conditions.

Build-out of the recommended system will result in almost 35 new miles of bicycle facilities. Of these, approximately 7 miles are proposed pathways and the remaining 28 miles are on-street facilities. Almost 9 miles are proposed bike lanes and over 18 miles are proposed bike routes. There are also three over crossings. As **Table 8-6 - Cost Summary of Proposed Improvements** shows, the estimated total cost of constructing all of the recommended bicycle projects is approximately $27 million. Not including the four overcrossings in the Transit Area, the estimated total cost for the recommended bicycle projects is approximately $7 million.

Table 8-6 - Cost Summary of Proposed Improvements

Bicycle Facility Type	Mileage	Total Cost
Class I Bike Paths – Expanding the Path Network	6.07	$5,605,989
Class I Bike Paths – Transit Area Crossings	0.84	$20,000,000
Class I Bike Paths Subtotal	*6.94*	*$25,605,989*
Class II Bike Lanes – Vehicle Lane Reductions	1.22	$176,798
Class II Bike Lanes - Arterial Connections	7.71	$481,341
Class II Bike Lanes Subtotal	*8.93*	*$658,139*
Class III Bike Route - Arterial Connections	5.51	$114,659
Class III Bike Routes - Neighborhood Connections	6.21	$162,242
Class III Bike Routes – Recreational Rides	3.71	$81,880
Class III Bike Routes Subtotal	*15.43*	*$358,781*
Total	*31.3*	*$26,622,909*

Notes: Costs are in 2008 dollars.

8.2.2. Maintenance

Bicycle paths require regular maintenance and repair as needed. On-street bikeways are maintained as part of the normal roadway maintenance program and extra emphasis should be put on keeping the bike lanes and roadway shoulders clear of debris and keeping vegetation overgrowth from blocking visibility or creeping into the roadway. The typical maintenance costs for the bikeway network are shown in **Table 8-7 - Bikeway Maintenance Frequency and Cost Opinions.**

Using cost opinions in Table 8-7, and assuming the bikeways are constructed given the proposed phasing schedule, it is estimated that maintenance of the bikeway network envisioned by this plan would cost an additional $92,000.

Table 8-7 - Bikeway Maintenance Frequency and Cost Opinions

Facility Type	Unit Cost	Description	Length (Miles)	Annual Cost	Notes
Class I	$8,500	Miles/Year	6.94	$58,990	Lighting and debris and removal of vegetation overgrowth.
Class II	$2,000	Miles/Year	8.93	$17,860	Repainting lane stripes and stencils, sign replacement as needed
Class III	$1,000	Miles/Year	15.43	$15,430	Sign and shared use stencil replacement as needed
			Annual Cost	*$92,280*	

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9. Funding Sources

Funding for bicycle projects, programs, and plans comes from a variety of different sources. This chapter covers federal, State, regional and local sources of bicycle funding, as well as some non-traditional funding sources that have been used by local agencies to fund bicycle infrastructure and programs.

9.1. Federal Funding Sources

The primary federal source of surface transportation funding—including bicycle facilities—is SAFETEA-LU, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. SAFETEA-LU is the fourth iteration of the transportation vision established by Congress in 1991 with the Intermodal Surface Transportation Efficiency Act (ISTEA) and renewed in 1998 and 2003 through the Transportation Equity Act for the 21st Century (TEA-21) and the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA). Also known as the federal transportation bill, the $286.5 billion SAFETEA-LU bill was passed in 2005 and authorizes Federal surface transportation programs for the five-year period between 2005 and 2009.

SAFETEA-LU funding is administered through the State (Caltrans and the State Resources Agency) and regional planning agencies. Most, but not all, of these funding programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. SAFETEA-LU programs require a local match of 11.47 percent. SAFETEALU funding is intended for capital improvements and safety and education programs and projects must relate to the surface transportation system.

Specific funding programs under SAFETEA-LU include, but are not limited to:

- Congestion Mitigation and Air Quality (CMAQ) – Funds projects that are likely to contribute to the attainment of national ambient air quality standards
- Recreational Trails Program—$370 million nationally through 2009 for non-motorized trail projects
- Safe Routes to School Program—$612 million nationally through 2009
- Transportation, Community and System Preservation Program—$270 million nationally over five years
- Federal Lands Highway Funds—Approximately $4.5 billion dollars are available nationally through 2009

9.1.1. Federal Lands Highway Funds

Federal Lands Highway Funds may be used to build bicycle facilities in conjunction with roads and parkways at the discretion of the department charged with administration of the funds. The projects must be transportation-related and tied to a plan adopted by the State and MPO (Metropolitan

Transportation Commission) Federal Lands Highway Funds may be used for planning and construction.

9.1.2. Transportation, Community and System Preservation Program

The Transportation, Community and System Preservation (TCSP) Program provides federal funding for transit oriented development, traffic calming and other projects that improve the efficiency of the transportation system, reduce the impact on the environment, and provide efficient access to jobs, services and trade centers. This program provides communities with the resources to explore the integration of their transportation system with community preservation and environmental activities. TCSP Program funds require a 20 percent match.

9.1.3. Regional Surface Transportation Program

The Regional Surface Transportation Program (RSTP) is a block grant program which provides funding for bicycle projects, among many other transportation projects. Under the RSTP, Metropolitan Planning Organizations, such as MTC, prioritize and approve projects which will receive RSTP funds. TAMC distributes the RSTP funds to local jurisdictions. Metropolitan planning organizations can transfer funding from other federal transportation sources to the RSTP program in order to gain more flexibility in the way the monies are allocated. In California, 62.5 percent of RSTP funds are allocated according to population. The remaining 37.5 percent is available statewide.

9.1.4. Regional Transportation Improvement Program

The Regional Transportation Improvement Program (RTIP) is a derivative of the STIP program and identifies projects which are needed to improve regional transportation. Such projects may include bicycle facilities, safety projects and grade separation, among many others. RTIP project planning, programming and monitoring may be funded up to 5 percent of total RTIP funds in urbanized regions. MTC prepares the RTIP, consisting of projects to be funded through STIP. MTC helps prioritize projects for the RTIP. Funded projects must be identified in the Regional Transportation Plan.

9.1.5. Recreational Trails Program

The Recreational Trails Program of SAFETEA-LU provides funds to states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, and other non-motorized as well as motorized uses. In California, the funds are administered by the California Department of Parks and Recreation. RTP projects must be ADA compliant. 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 of easements or property for trails;
- State administrative costs related to this program (limited to seven percent of a State's funds); and
- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a State's funds).

Six million dollars was available in 2008. More information is available at www.fhwa.dot.gov/environmnet/rectrails/index.htm

9.1.6. Land and Water Conservation Fund

Land and Water Conservation Fund is a federally funded program that provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. The Fund is administered by the National Parks Service and the California Department of Parks and Recreation and has been reauthorized until 2015.

Cities, counties and districts authorized to acquire, develop, operate and maintain park and recreation facilities are eligible to apply. Applicants must fund the entire project, and are reimbursed for 50 percent of costs. Property acquired or developed under the program must be retained in perpetuity for public recreational use. The grant process for local agencies is competitive, and 40 percent of grants are reserved for Northern California.

In 2007, approximately $1.27 million was available for projects in California.

9.1.7. Rivers, Trails and Conservation Assistance Program

The Rivers, Trails and Conservation Assistance Program (RTCA) is a National Parks Service program which provides technical assistance via direct staff involvement, to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance—there are no implementation monies available. Projects are prioritized for assistance based upon criteria which include conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation and focusing on lasting accomplishments.

9.2. Statewide Funding Sources

The State of California uses both federal sources and its own budget to fund the following bicycle projects and programs.

9.2.1. Bicycle Transportation Account

The Bicycle Transportation Account (BTA) provides state funding for local projects that improve the safety and convenience of bicycling for transportation. Because of its focus on transportation, BTA projects, including trail, must provide a transportation link. Funds are available for both planning and construction. BTA funding is administered by Caltrans and cities and counties must

have an adopted Bicycle Transportation Plan in order to be eligible. City Bicycle Transportation Plans must be approved by MTC prior to Caltrans approval. Out of $5 million available statewide, the maximum amount available for individual projects is $1.2 million.

9.2.2. Wildlife Conservation Board Public Access Program

Funding for the acquisition of lands or improvements that preserve wildlife habitat or provide recreational access for hunting, fishing or other wildlife-oriented activities. Up to $250,000 dollars available per project, applications accepted quarterly. Projects eligible for funding include interpretive trails, river access, and trailhead parking areas. The State of California must have a proprietary interest in the project. Local agencies are generally responsible for the planning and engineering phases of each project.

http://www.wcb.ca.gov/

9.2.3. California Conservation Corps

The California Conservation Corps (CCC) is a public service program which occasionally provides assistance on construction projects. The CCC may be written into grant applications as a project partner. In order to utilize CCC labor, project sites must be public land or be publicly accessible. CCC labor cannot be used to perform regular maintenance, however, they will perform annual maintenance, such as the opening of trails in the spring.

http://www.ccc.ca.gov/

9.2.4. Federal Safe Routes to School (SRTS) and California Safe Routes to School (SR2S)

Caltrans administers funding for Safe Routes to School projects through two separate and distinct programs: the state-legislated Program (SR2S) and the federally-legislated Program (SRTS). Both programs competitively award reimbursement grants with the goal of increasing the number of children who walk or bicycle to school. The programs differ in some important respects.

California Safe Routes to School Program expires January 1, 2013, requires a 10% local match, is eligible to cities and counties and targets children in grades K-12. The fund is primarily for construction, but up to 10% of the program funds can be used for education, encouragement, enforcement and evaluation activities. Fifty-two million dollars were available for Cycle 7 (FY 06/07 and 07/08).

The Federal Safe Routes to School Program expires September 30, 2009, reimburses 100%, is eligible for cities, counties, school districts, non-profits, and tribal organizations, and targets children in grades K-8. Program funds can be used for construction or for education, encouragement, enforcement and evaluation activities. Construction must be within 2 miles of a grade school or middle school. Forty-six million dollars are available for Cycle 2 (FY 08/09 and 09/10).

http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm

9.2.5. Environmental Justice: Context Sensitive Planning Grants

The Caltrans-administered Environmental Justice: Context Sensitive Planning Grants promotes context sensitive planning in diverse communities and funds planning activities that assist low-income, minority and Native American communities to become active participants in transportation planning and project development. Grants are available to transit districts, cities, counties and tribal governments. This State Highway Account at funds $1.5 million annually. The cap for statewide grants is $250,000.

http://www.dot.ca.gov/hq/tpp/grants.html

9.2.6. Office of Traffic Safety (OTS) Grants

The California Office of Traffic Safety distributes federal funding apportioned to California under the National Highway Safety Act and SAFETEA-LU. Grants are used to establish new traffic safety programs, expand ongoing programs or address deficiencies in current programs. Bicycle and pedestrian safety are included in the list of traffic safety priority areas. Eligible grantees are: governmental agencies, state colleges, and 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, collision statistics and rankings, seriousness of problems, and performance on previous OTS grants. OTS expects to have $56 million in funding available statewide for FY 2006/07.

http://www.dot.ca.gov/hq/traffops/saferesr/

9.2.7. Community Based Transportation Planning Demonstration Grant Program

This fund, administered by Caltrans, provides funding for projects that exemplify livable community concepts including bicycle improvement projects. Eligible applicants include local governments, MPO's and RPTA's. A 20 percent local match is required and projects must demonstrate a transportation component or objective. There are $3 million dollars available annually statewide.

http://www.dot.ca.gov/hq/tpp/grants.html

9.3. Regional Funding Sources

Regional bicycle grant programs come from a variety of sources, including SAFETEA-LU, the State budget and vehicle registration fees.

9.3.1. Transportation Fund for Clean Air Program (TFCA)

TFCA funds are generated by a four dollar surcharge on automobile registration fees in the nine-county Bay Area. Approximately $20 million is collected annually which funds two programs: 60 percent of the TFCA monies go to the Regional Fund and 40 percent go to the County Program Manager. The Regional Fund is administered by the Bay Area Air Quality Management District (BAAQMD).

The Bicycle Facility Program (BFP) is a grant program provided by the Bay Area Air Quality Management District's Transportation Fund for Clean Air Regional Fund. Bay Area public agencies are eligible to apply for these funds that are applicable for new bicycle facilities, including Class I, II, and III. Also eligible is bike parking and bike racks for transit vehicles. The total amount available in fiscal year 2007/08 was of $600,000. The minimum grant for a single project was $10,000 and the maximum grant was 35 percent of the total funds available or $210,000 in 2007/08.

http://www.baaqmd.gov/pln/grants_and_incentives/bfp/index.htm

9.3.2. Transportation for Livable Communities Program

The Transportation for Livable Communities Program (TLC) provides grant monies to public agencies to encourage land use decisions that support compact, pedestrian and bicycle friendly development near transit hubs. MTC administers the TLC program with funds from the Regional Surface Transportation Project. TLC grants are capped at $400,000 and are competitive. Funds may be used for capital projects or planning.

http://www.mtc.ca.gov/planning/smart_growth/tlc_grants.htm

9.3.3. Transportation Enhancement Program

The Transportation Enhancement Program provides funds for the construction of projects, beyond the scope of typical transportation projects, which enhance the transportation system. Transportation Enhancement Projects may include landscaping, bicycle facilities and streetscape improvements. Transportation Enhancement projects are programmed as part of the STIP. Annual apportionment averages around $500,000.

http://www.dot.ca.gov/hq/transprog/ocip/stip2008_te.html

9.3.4. Regional Bicycle and Pedestrian Program (RBPP)

The RBPP was created in 2003 as part of the long range Transportation 2030 Plan developed by MTC. The program—currently funded with Congestion Mitigation and Air Quality funds—funds regionally significant bicycle and pedestrian projects, and bicycle and pedestrian projects serving schools or transit. $200 million dollars are committed to this program over the 25-year period. Seventy five percent of the total funds are allocated to the county congestion management agencies based on population. The remaining 25 percent of funds are regionally competitive, with the county CMAs recommending the projects to be submitted to MTC for funding consideration.

www.mtc.ca.gov/planning/bicyclespedestrians/regional.htm#bikepedprog

9.3.5. Safe Routes to Transit (SR2T)

Regional Measure 2 (RM2), approved in March 2004, raised the toll on seven state-owned Bay Area bridges by one dollar for 20 years. This fee increase funds various operational improvements and capital projects which reduce congestion or improve travel in the toll bridge corridors.

Twenty million dollars of RM2 funding is allocated to the Safe Routes to Transit Program, which provides competitive grant funding for capital and planning projects that improve bicycle and pedestrian access to transit facilities. Eligible projects must be shown to reduce congestion on one or more of the Bay Area's toll bridges. The Transportation and Land Use Coalition and the East Bay Bicycle Coalition administer the competitive grant process. Competitive funding is awarded in five $4 million grant cycles. The first round of funding was awarded in December 2005. Future funding cycles will be in 2009, 2011 and 2013.

http://www.transcoalition.org/c/bikeped/bikeped_saferoutes.html

9.3.6. Housing Incentive Program (HIP)

As part of the Transportation for Livable Communities (TLC) program, the Metropolitan Transportation Commission's (MTC) Housing Incentive Program (HIP) rewards local governments that build housing near transit stops. HIP funds are intended to be used for transportation capital projects that support Transportation for Livable Communities (TLC) goals. Typical capital projects include pedestrian and bicycle facilities that connect the housing project to adjacent land uses and transit; improved sidewalks and crosswalks linking the housing to a nearby community facility such as a school or a public park; or streetscape improvements that support increased pedestrian, bicycle, and transit activities and safety.

The dollar amount of HIP funds that may be requested is determined by the density of the qualifying housing development and the number of affordable and market rate bedrooms that will be provided. The maximum grant amount per jurisdiction is $3 million.

http://www.mtc.ca.gov/planning/smart_growth/hip.htm

9.3.7. Lifeline Transportation Program

Program established to fund projects that result in improved mobility for low-income residents of the nine San Francisco Bay Area counties. The Lifeline Program supports community-based transportation projects that:

- Are developed through a collaborative and inclusive planning process that includes broad partnerships among a variety of stakeholders such as public agencies, transit operators, community-based organizations and other community stakeholders, and outreach to underrepresented stakeholders.

- Address transportation gaps and/or barriers identified through a Community-Based Transportation Plan (CBTP), countywide or regional Welfare-to-Work Transportation Plan, or are otherwise based on a documented assessment of needs within the designated communities of concern. Findings emerging from one or more CBTPs may also be applied to other low-income areas, or otherwise be directed to serve low-income constituencies within the county, as applicable.
- Improve a range of transportation choices by adding a variety of new or expanded services including but not limited to: enhanced fixed route transit services, shuttles, children's programs, taxi voucher programs, improved access to autos, capital improvement projects. Transportation needs specific to elderly and disabled residents of low-income communities may also be considered when funding projects.

Funding for the Lifeline program varies from year to year. Available funding through the end of FY 2008 is estimated at $18M.

http://www.mtc.ca.gov/planning/lifeline/index.htm

9.4. Local Funding Sources

9.4.1. TDA Article 3

Transportation Development Act (TDA) Article 3 funds are state block grants awarded annually to local jurisdictions for transit, bicycle and pedestrian projects in California. Eligible bicycle projects include: construction and engineering for capital projects; maintenance of bikeways; bicycle safety education programs (up to 5 percent of funds); and development of comprehensive bicycle facilities plans. A city or county is allowed to apply for funding for bicycle plans not more than once every five years. These funds may be used to meet local match requirements for federal funding sources. 2 percent of the total TDA apportionment is available for bicycle and pedestrian funding.

http://www.mtc.ca.gov/funding/STA-TDA/

9.4.2. VTA Bicycle Expenditure Program

The 2000 Santa Clara Countywide Bicycle Plan established the VTA Bicycle Expenditure Plan (BEP) to fund countywide bicycle projects. The BEP funding list was updated in 2004. The Program includes funds from the 1996 Measure B Sales Tax, Transportation Development Act Article 3 funds, Transportation Funds for Clean Air, and TEA 21 funds. the BEP and will be programmed to other bicycle projects. The project list is reviewed every three years. A minimum 20 percent match from non-BEP sources is required for these projects.

http://www.vta.org/projects/bikeprogram.html

9.5. Non-Traditional Funding Sources

9.5.1. Community Development Block Grants

The CDBG program provides money for streetscape revitalization. Federal Community Development Block Grant Grantees may "use CDBG funds for activities that include (but are not limited to): acquiring real property; reconstructing or rehabilitating housing and other property; building public facilities and improvements, such as streets, sidewalks, community and senior citizen centers and recreational facilities, paying for planning and administrative expenses, such as costs related to developing a consolidated Plan and managing CDBG funds; provide public services for youths, seniors, or the disabled; and initiatives such as neighborhood watch programs."

$39 million in CDBG funds were distributed statewide in 2008.

www.hud.gov/offices/cpd/communitydevelopment/programs/index.cfm

9.5.2. Requirements for New Developments

With the increasing support for "routine accommodation" and "complete streets," requirements for new development, road widening and new commercial development provide opportunities to efficiently construct bicycle facilities.

9.5.3. Impact Fees

One potential local source of funding is developer impact fees, typically tied to trip generation rates and traffic impacts produced by a proposed project. A developer may attempt to reduce the number of trips (and hence impacts and cost) by paying for on- and off-site bicycle improvements designed to encourage residents, employees and visitors to the new development to bike rather than drive. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical to ensure legal soundness.

9.5.4. Mello-Roos Community Facilities Act

The Mello-Roos Community Facilities Act was passed by the Legislature in 1982 in response to reduced funding opportunities brought about by the passage of Proposition 13. The Mello-Roos Act allows any county, city, special district, school district or joint powers of authority to establish a Community Facility Districts (CFD) for the purpose of selling tax-exempt bonds to fund public improvements within that district. CFDs must be approved by a two-thirds margin of qualified voters in the district. Property owners within the district are responsible for paying back the bonds. Pedestrian facilities are eligible for funding under CFD bonds.

http://mello-roos.com/pdf/mrpdf.pdf

9.5.5. Volunteer and Public-Private Partnerships

Volunteer programs may substantially reduce the cost of implementing some of the proposed pathways. Use of groups such as the California Conservation Corp (who offers low cost assistance) will be effective at reducing project costs. Local schools or community groups may use the bikeway projects as a project for the year, possibly working with a local designer or engineer. Work parties may be formed to help clear the right of way where needed. A local construction company may donate or discount services. A challenge grant program with local businesses may be a good source of local funding, where corporations 'adopt' a bikeway and help construct and maintain the facility.

A. Design Guidelines

This appendix provides basic bikeway planning and design guidelines for use in developing the Milpitas bikeway system and support facilities. Where noted, designs are for elements required by the State of California for compliance with Caltrans Highway Design Manual Chapter 1000 "Bikeway Planning and Design" guidelines. Otherwise, these guidelines include additional recommendations, providing information on optional design treatments. Although this information meets Caltrans requirements it is not intended to state a minimum or maximum accommodation or to replace any existing adopted roadway design guidelines. Also included in this Chapter are experimental or nonstandard best practices with information about optional innovative bikeways and support facilities that have not been adopted by the Manual of Uniform Traffic Control Devices (MUTCD) or State of California for use in California and do not meet Caltrans Chapter 1000 design requirements.

All facility designs are subject to engineering design review.

A.1. Bikeway Facility Classifications

According to Caltrans, the term "bikeway" encompasses all facilities that provide primarily for bicycle travel. Caltrans has defined three types of bikeways in Chapter 1000 of the Highway Design Manual: Class I, Class II, and Class III. For each type of bikeway facility both "Design Requirements" and "Additional Design Recommendations" are provided. "Design Requirements" contain requirements established by Caltrans Chapter 1000 "Bikeway Planning and Design". "Additional Design Recommendations" are provided as guidelines to assist with design and implementation of facilities and include alternate treatments approved or recommended but not required by Caltrans. **Figure A-1 – Bicycle Facility Types** provides an illustration of these three types of bicycle facilities.

A.2. Class I Bikeway Design

Typically called a "bike path" or "shared use path," a Class I bikeway provides bicycle travel on a paved right-of-way completely separated from any street or highway. The recommended width of a shared use path is dependent upon anticipated usage:

- 8 feet (2.4 m) is the minimum width for Class I facilities
- 8 feet (2.4 m) may be used for short neighborhood connector paths (generally less than one mile in length) due to low anticipated volumes of use
- 10 feet (3.0 m) is the recommended minimum width for a typical two-way bicycle path
- 12 feet (3.6 m) 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

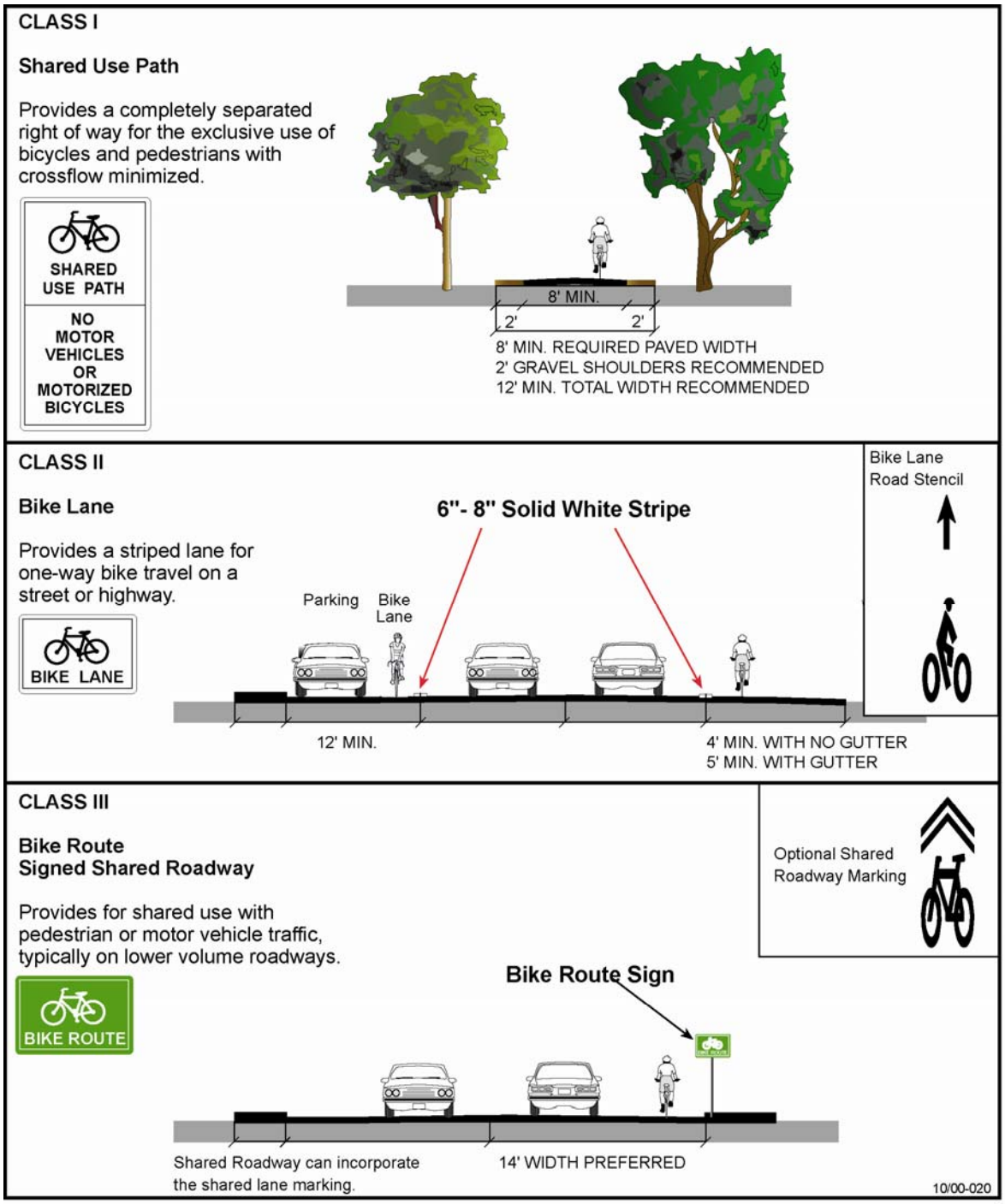


Figure A-1 – Bicycle Facility Types

A minimum 2 feet (0.6 m) wide graded area must be provided adjacent to the path to provide clearance from trees, poles, walls, guardrails, etc. On facilities with expected heavy use, a yellow centerline stripe is recommended to separate travel in opposite directions. **Figure A-2 – Typical Class I Cross Section** illustrates a typical cross-section of a Class I multi-use path.

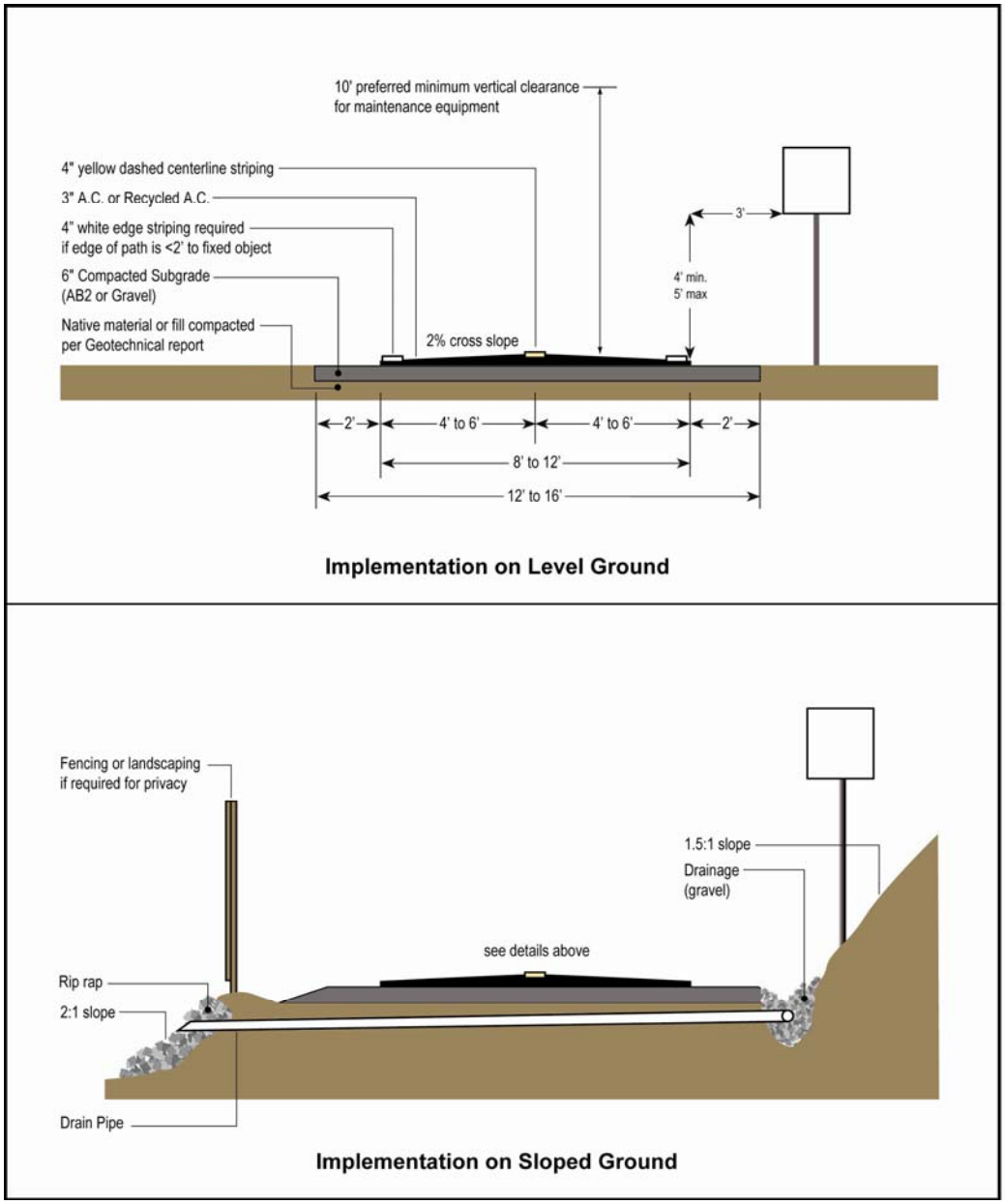


Figure A-2 – Typical Class I Cross Section

A.2.1. Class I Bikeway Crossing Designs

A.2.1.1. At–Grade Intersection

When shared-use paths cross streets, proper design should be developed on the pathway as well as on the roadway to alert bicyclists and motorists of the crossing. Sometimes on larger streets, at mid-block pathway crossing locations as shown in **Figure A-3 - Shared Use Path Mid-Block Crossing** an actuated signal is necessary. A signal allows bicyclists a clear crossing of a multi-lane roadway. If a signal is or is not needed, appropriate signage and pavement markings should be installed, including stop signs and bike crossing pavement markings.

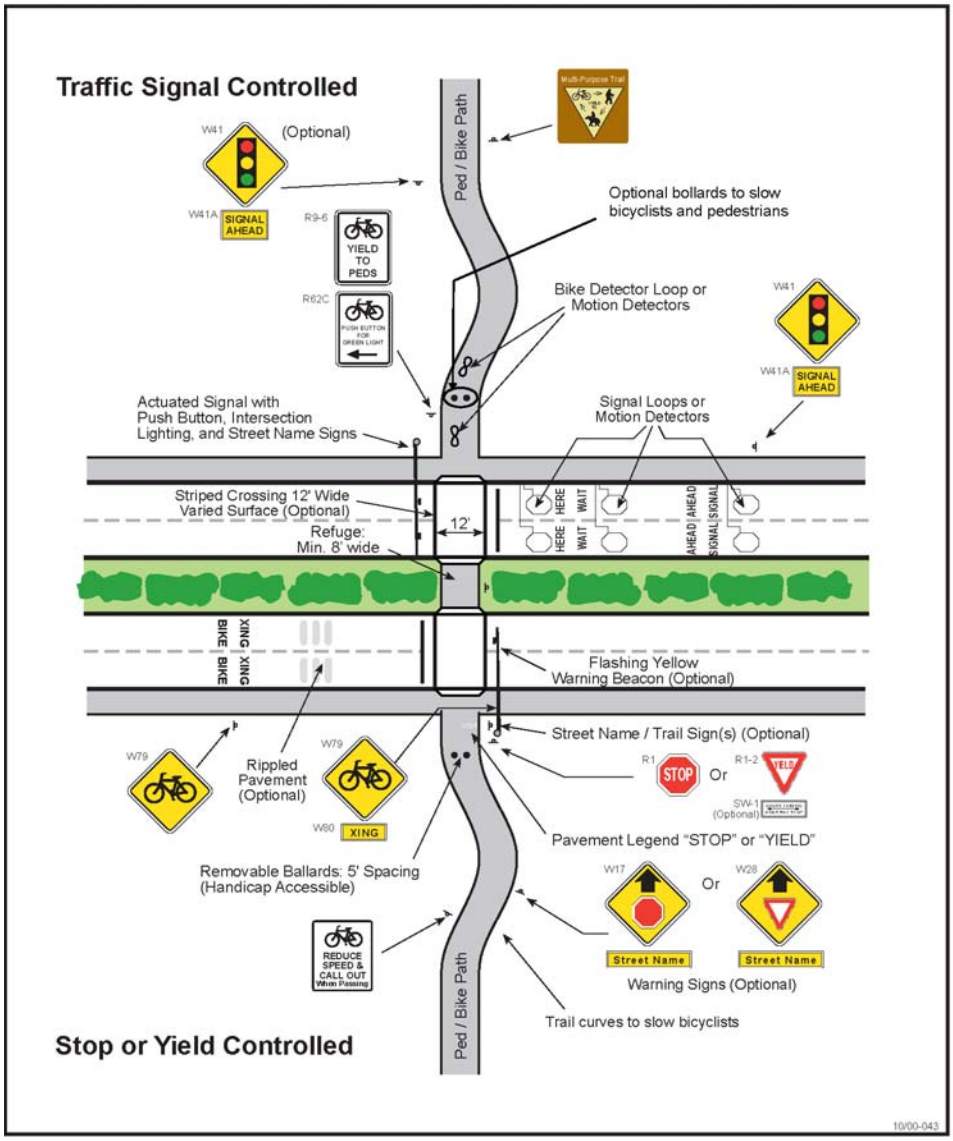


Figure A-3 - Shared Use Path Mid-Block Crossing

A.2.1.2. Barrier Posts

Posts at multi-use path intersections and entrances may be necessary to keep vehicles from entering. Posts should be designed to be visible to bicyclists and others, especially at night, with reflective materials, appropriate striping and lighting where appropriate. Posts should be designed to be easily moveable by emergency vehicles, such as bollards or a half gate and bollard, see **Figure A-4 – Bollard Specifications** for more detail. A post should be placed in the center of the path or where more than one post is necessary, a 5-foot spacing is used to permit passage of bicycle trailers, adult tricycles, and wheelchairs. One or three bollards are recommended because two bollards placed in the paved portion of a path channel users into the center of the path, causing possible head-on collisions.[1]

[1] Rails to Trails Conservancy, *Trails for the Twenty-First Century, 2nd Edition* (April 2001).

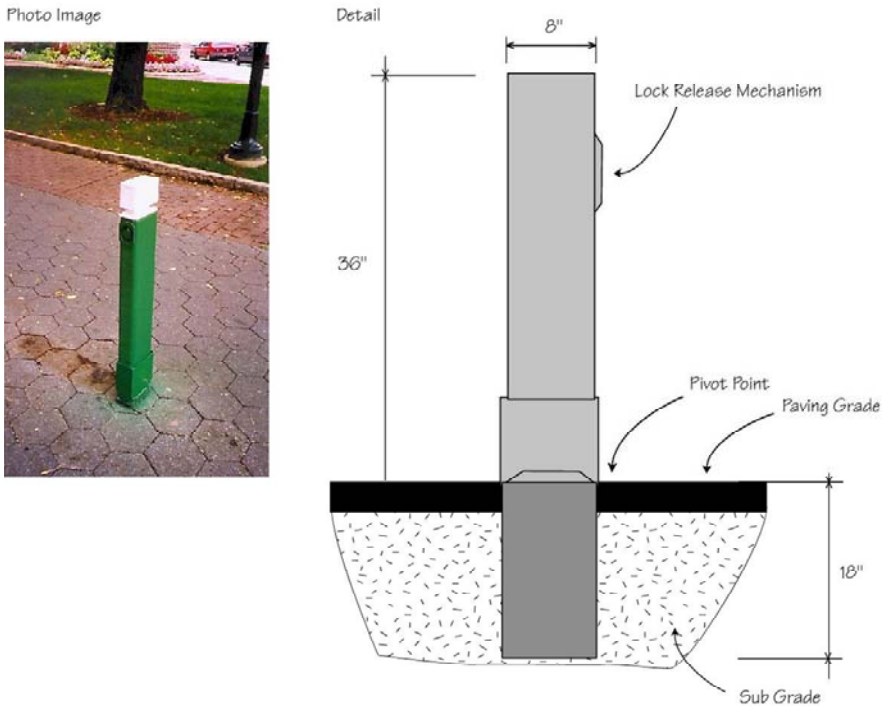


Figure A-4 – Bollard Specifications

A.2.1.3. Overcrossings

Overcrossings are also an important component of bikeway design. Barriers to bicycling often include freeways, complex interchanges, and rivers. When a route is not available to cross these barriers a bicycle overcrossing is necessary.

Figure A-5 - Overcrossing Design Guidelines illustrates basic design standards for typical designs. Some design considerations for overcrossings include:

- Pathways must be a minimum 6 feet wide, with a preferred width of 8 or 10 feet wide
- Slope of any ramps must comply with ADA Guidelines
- Screens are often a necessary buffer between vehicle traffic and the bicycle overcrossing

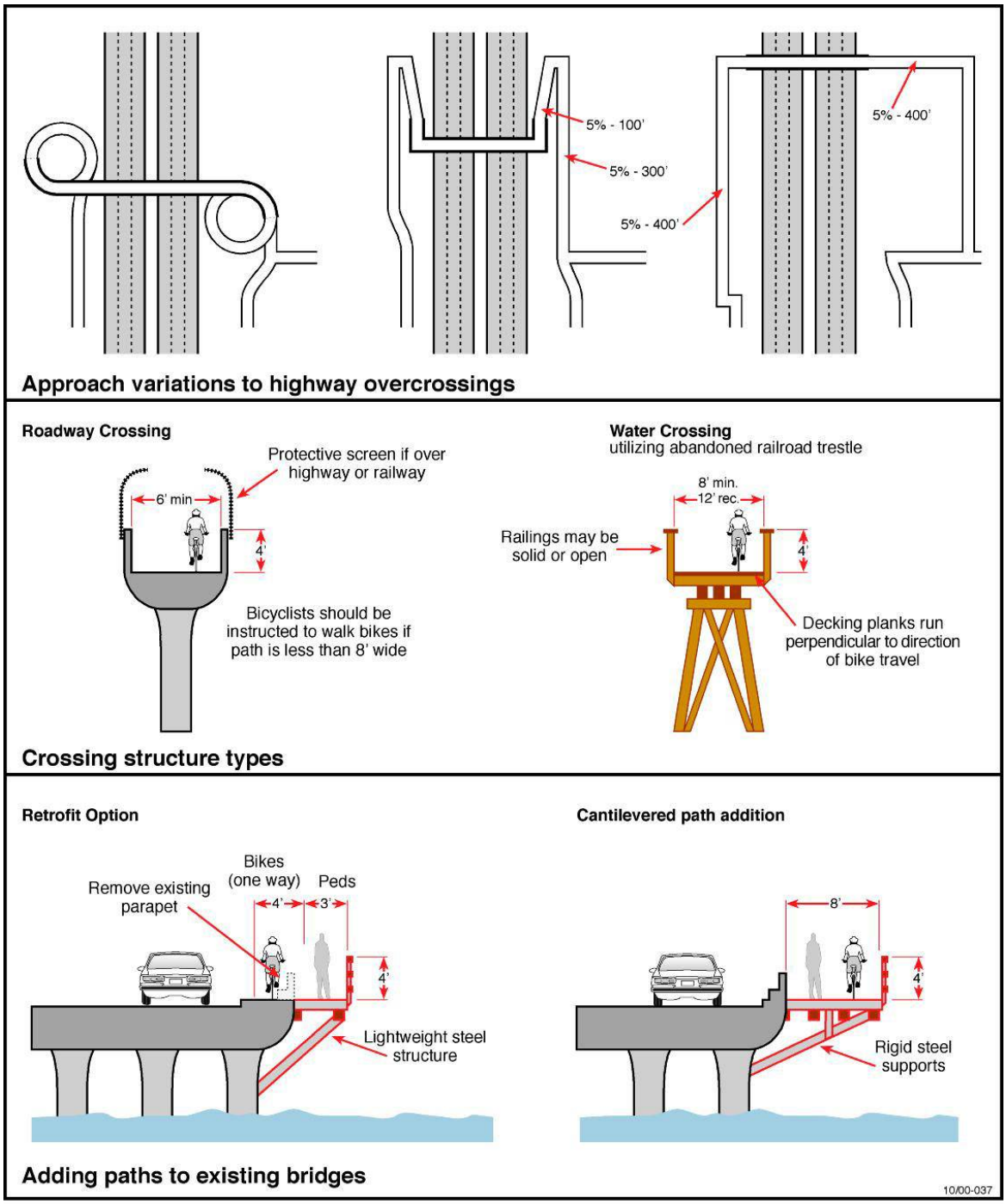


Figure A-5 - Overcrossing Design Guidelines

A.2.1.4. Undercrossings

Undercrossings are an important component of Class I bikeway design. **Figure A-6 - Undercrossing Design Guidelines** shows designs for undercrossings Some considerations for undercrossings include:

- Must have adequate lighting and sight distance for safety

- Must have adequate over-head clearance of at least 3.1 m (10 ft)
- Tunnels should be a minimum 4.3 m (14 ft) for several users to pass one another safely; a 3.0 m x 6.0 m (10 ft x 20 ft) arch is the recommended standard
- "Channeling" with fences and walls into the tunnel should be avoided for safety reasons
- May require drainage if the sag point is lower than the surrounding terrain.

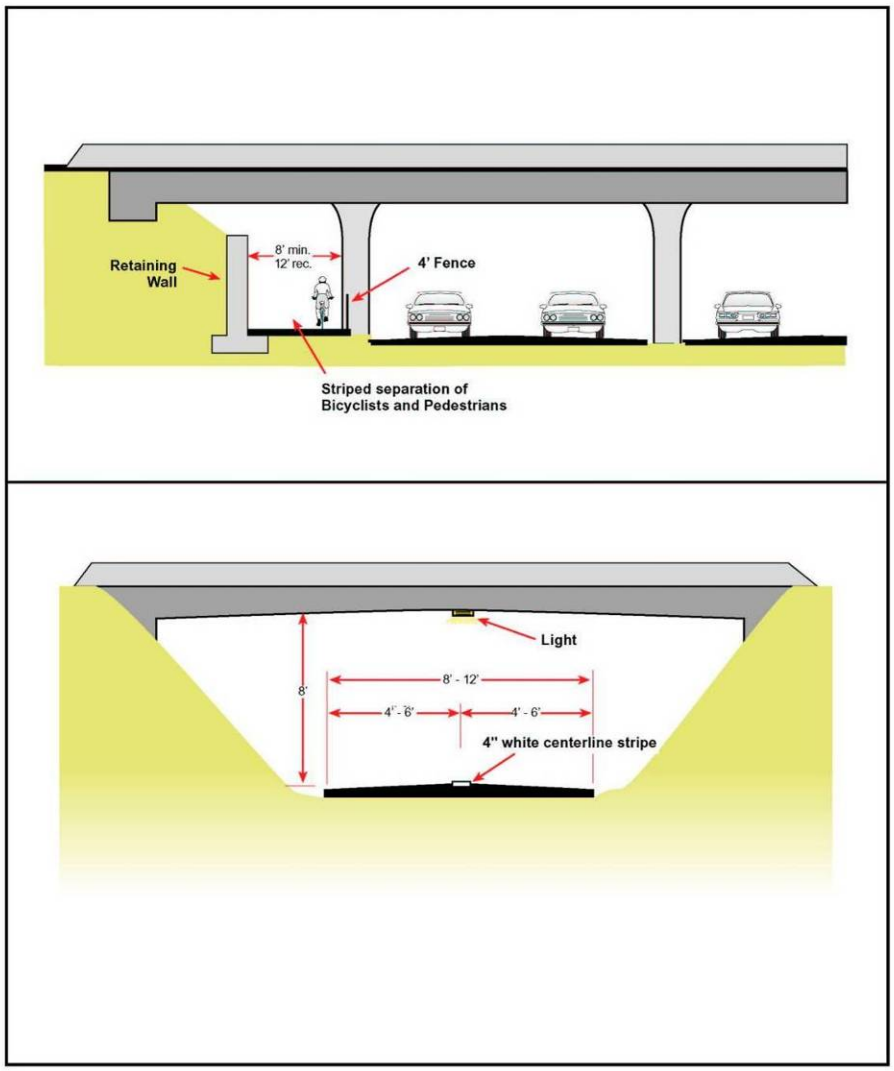


Figure A-6 - Undercrossing Design Guidelines

A.3. Class II Bikeway Design

Often referred to as a "bike lane," a Class II bikeway provides a striped and stenciled lane for one-way travel on either side of a street or highway. **Figure A-7 – Typical Class II Cross Section** shows a typical Class II cross-section. To provide bike lanes along corridors where insufficient space is currently available, extra room can be provided by removing a traffic lane, narrowing traffic lanes,

or prohibiting parking. The width of the bike lanes vary according to parking and street conditions. Note that these dimensions are for reference only, may not meet Milpitas Standards and are subject to engineering design review.

- 4 feet (1.2 m) minimum if no gutter exists, measured from edge of pavement
- 5 feet (1.5 m) minimum with normal gutter, measured from curb face; or 3' (0.9 m) measured from the gutter pan seam
- 5 feet (1.5 m) minimum when parking stalls are marked
- 11 feet (3.3 m) minimum for a shared bike/parking lane where parking is permitted but not marked on streets without curbs; or 12 feet (3.6 m) for a shared lane adjacent to a curb face.

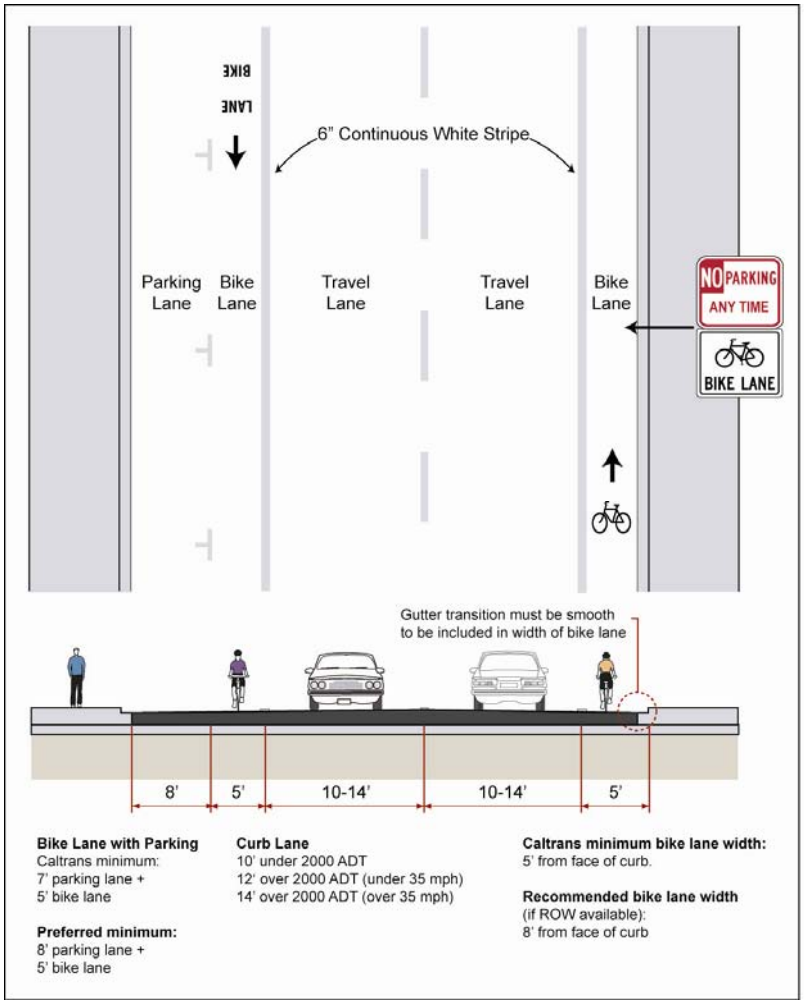


Figure A-7 – Typical Class II Cross Section

A.3.1. Bike Lanes

Figure A 7 - CA MUTCD Examples of Optional Word and Symbol Pavement Markings for Bicycle Lanes provides examples for bike lane marking and striping. Further details regarding

bicycle lane demarcation—specifically addressing turn movements—can be found in the CA MUTCD.

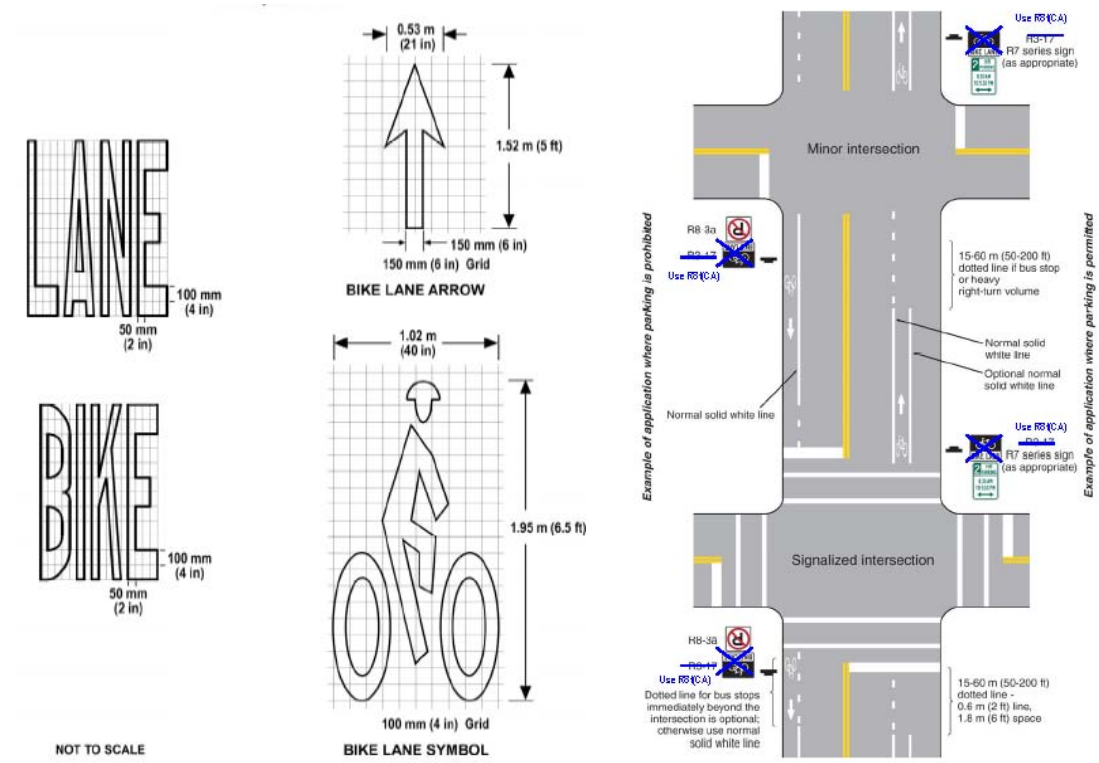


Figure A-8 - CA MUTCD Examples of Optional Word and Symbol Pavement Markings for Bicycle Lanes

A.3.2. Class II Intersection Design

A.3.2.1. Signalized Intersections

Intersections represent a primary collision points for bicyclists. Small intersections with few lanes are relatively easy to manage. **Figure A-9 - Bicycle Lane Configurations at Intersections** shows how to configure bicycle lanes at intersections with minimal vehicle lanes. Large, multi-lane intersections, are more difficult for bicyclists to travel through than smaller, two-lane intersections. This section includes design considerations for larger intersections, including .

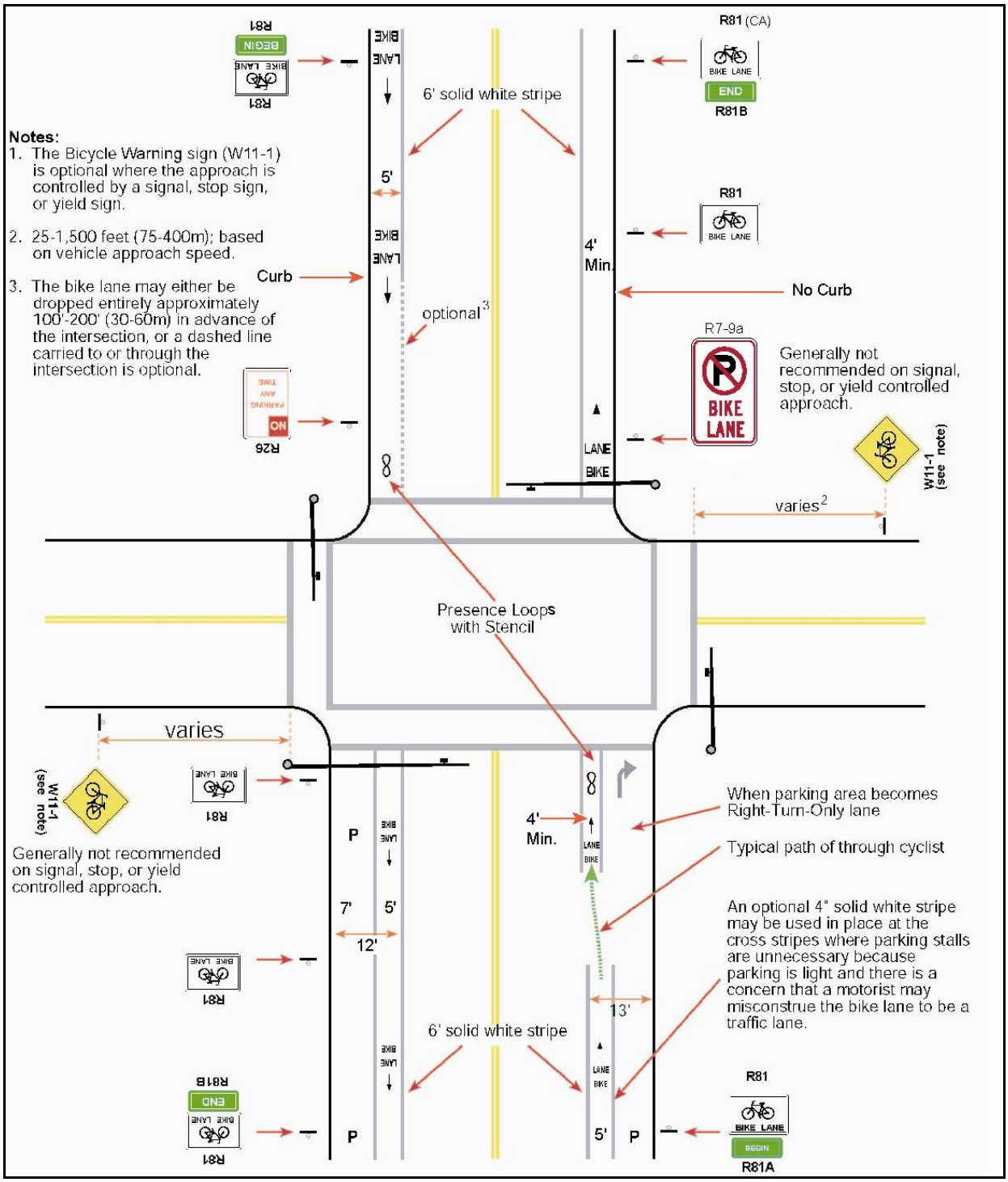


Figure A-9 - Bicycle Lane Configurations at Intersections

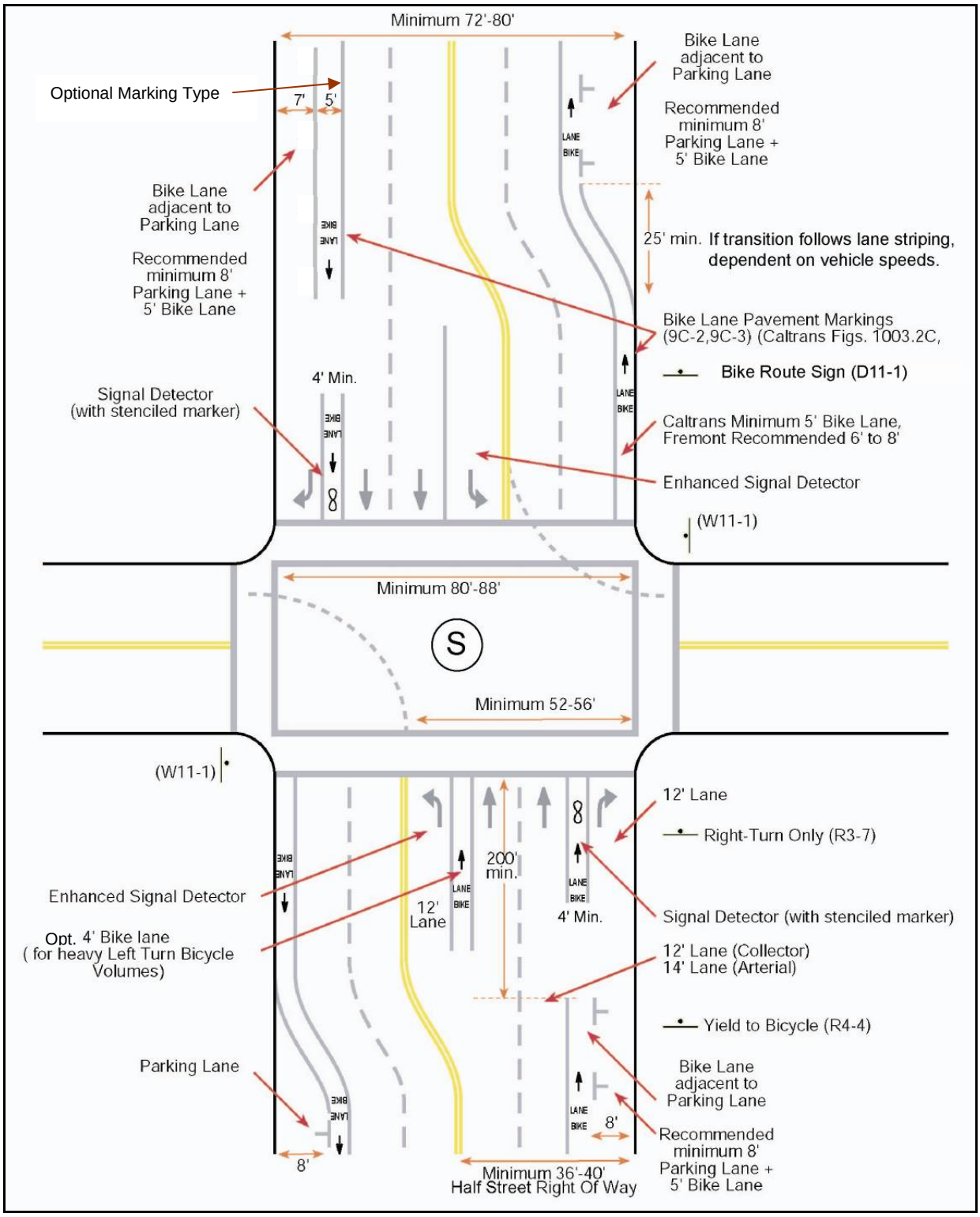


Figure A-10 - Dedicated Bike Turn Lanes at an Intersection

Challenges and potential solutions for bicyclists at large signalized intersections include:

- Signals may not be timed to allow slower-moving bicyclists to travel across the intersection.
    - Solution: Bicycle adaptive signal timing:
- Loop detectors or video detection that is used to actuate the signal may not be calibrated to detect bicyclists.
    - Solution: Design standard of bike loop use.
- Bicyclists may not know how to actuate the signal using loop detectors, even if it is calibrated.
    - Solution: Use of bike loop detector symbol.
- Bicyclists who wish to turn left may be required to travel across several motor vehicle lanes to reach the left hand turn lane.
    - Solution: Enhanced signage.
- Bicyclists who wish to turn left like a pedestrian may experience long delays as they wait through several light cycles.
    - Solution: Well-signed bikeways.
- Bicyclists who are traveling straight may have to merge across motor vehicle traffic that is turning right from a right-turn lane.
    - Solution: Bike lane pockets at intersections, between through and right turn lanes.
- Motorists may be less likely to be aware of bicyclists at large, multi-lane intersections due to higher traffic volumes, more lanes of traffic and the complexity of large intersections
    - Solution: Enhanced bike lane signage.
- Large intersections without bicycle facilities are very auto-centric, leading motorists to assume that bicyclists are not supposed to be on the roadway.
    - Solution: Installation of bicycle facilities, including pavement markings and signage.

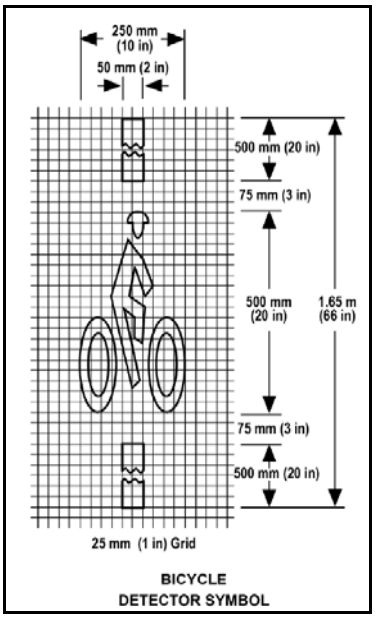
Design treatments can help bicyclists travel through intersections and alert motorists of bicyclists' presence. Good intersection design alerts motorist to bicyclists, indicates to motorists and bicyclists where bicyclists may ride, and guides bicyclists through intersections.

This treatment provides a design for where a roadway with Class II bike lanes intersects with a road at a signalized intersection.

A.3.2.2. Bicycle Actuated Signals & Adaptive Signal Timing

Make intersections more "friendly" to bicyclists, involves modifying how they operate. Improved signal timing, calibrating loop detectors to detect bicyclists, and camera detection makes intersections easier for bicyclists to cross intersections.

Loop detectors are installed within the roadway to allow the metal of a motor vehicle to trigger a change in the traffic signal. Many standard motor vehicle loop detectors can be calibrated to detect bicycles. This allows the bicyclist to stay within the lane of travel and avoid maneuvering to the side of the road to trigger a push button. Signals can be configured so that if a bicycle is detected, an extended green time can be provided. Milpitas should use hard-wire loops at signalized intersections with bike lanes instead of video detection to reduce false detection or extension of green for adaptive timing.



The California Manual on Uniform Traffic Devices has specific standards for loop detector pavement markings

Standards suggest intersections utilize markings to indicate the location where a bicyclist is to be positioned in order to actuate a signal. Adjacent signage is also recommended to emphasize the connection between the marking and the signal.

A.3.2.3. Right-Turn Only Lanes

Right-turn only lanes can present challenges for bicyclists traveling through an intersection. Bicyclists must merge to the left to position themselves in the through travel lane. Jurisdictions will sometimes stripe bike lanes on the right-side of right-turn only lanes, which places the through-bicyclist in direct conflict with a right-turning vehicle. The appropriate treatment for right-turn only lanes is to either drop the bike lane entirely approaching the right-turn lane, or to place a bike lane pocket between the right-turn lane and the right-most through lane. **Figure A-11 - Bike Lane Adjacent to Right Turn Only Lane** shows an example of the through bike lane pocket. The first Yield to Bikes sign in the figure is not in the CA MUTCD, this is an adapted sign originally described in the Portland Blue Bike Lanes Study.[2]

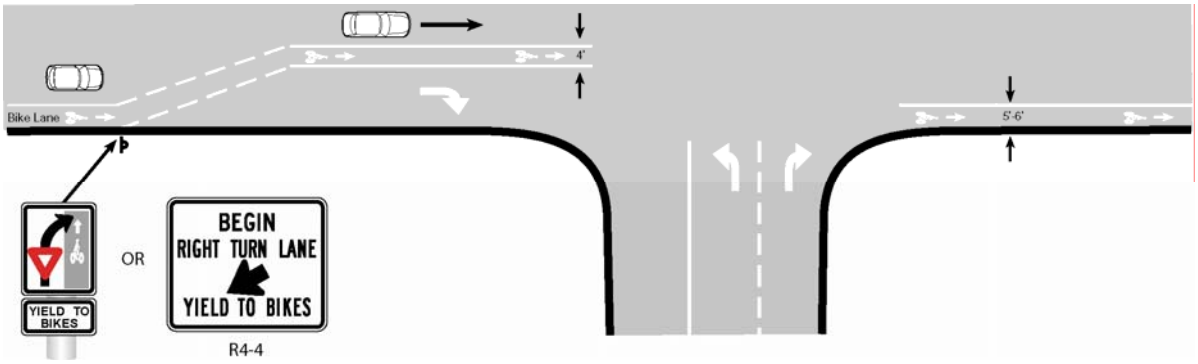


Figure A-11 - Bike Lane Adjacent to Right Turn Only Lane

A.3.2.4. Freeway Ramps

Freeway on- and off-ramp crossings present a potential conflict zone for bicyclists and motorists, as bicycle lanes are typically dropped and bicyclists must merge across travel lanes where vehicles are accelerating or decelerating from freeway speeds. The appropriate bicyclist behavior is to merge left

[2] Portland's Blue Bike Lanes, City of Portland, Office of Transportation, July 1, 1999.

to be positioned in the through lane well before the mouth of the on-ramp, and to remain out away from the curb until past the off-ramp. Implementation of interchange improvements requires coordination with Caltrans District 4 regarding placement of signage and striping because these areas are in Caltrans' right-of-way. Two guidelines for these improvements are:

- The bicycle merge should begin 250 feet in advance of the freeway on-ramp.
- Appropriate signage and striping should be used to warn bicyclists and motorists of the merge.

Bicycle improvements to freeway ramps are shown in **Figure A-12 - Bike Crossing of Freeway Ramps**. The first Yield to Bikes sign in the figure is not in the CA MUTCD, this is an adapted sign originally described in the Portland Blue Bike Lanes Study.[3]

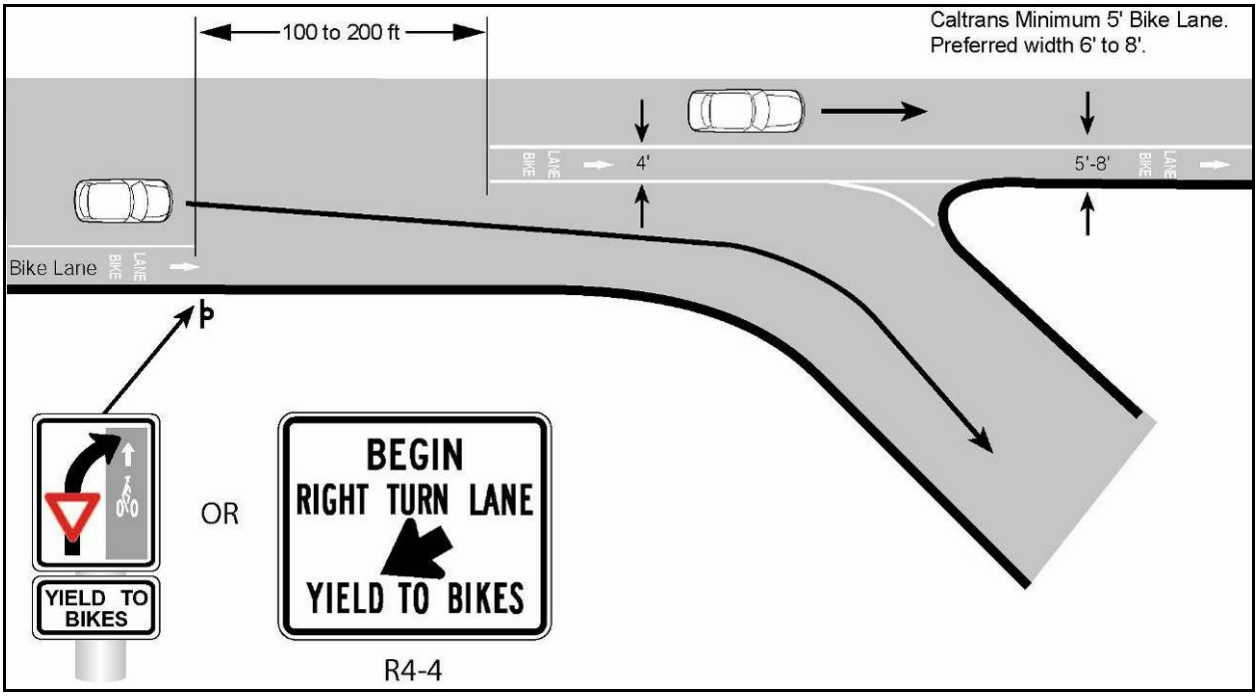


Figure A-12 - Bike Crossing of Freeway Ramps

A.3.2.5. At-Grade Railroad Crossings

There are multiple rail lines in Milpitas that cross existing and proposed bikeways. Railroad tracks can be a hazardous to bicyclists. If bicyclists do not ride at a 90 degree angle over the tracks, bicyclists' wheels can catch in the tracks and potentially lead to a collision. **Figure A-13 - Bike Lanes Crossing at Railroad Tracks** shows the proper design for a bike lane crossing railroad tracks. Bike lanes should cross train tracks at 90 degrees, helping to prevent collisions.

[3] Portland's Blue Bike Lanes, City of Portland, Office of Transportation, July 1, 1999.

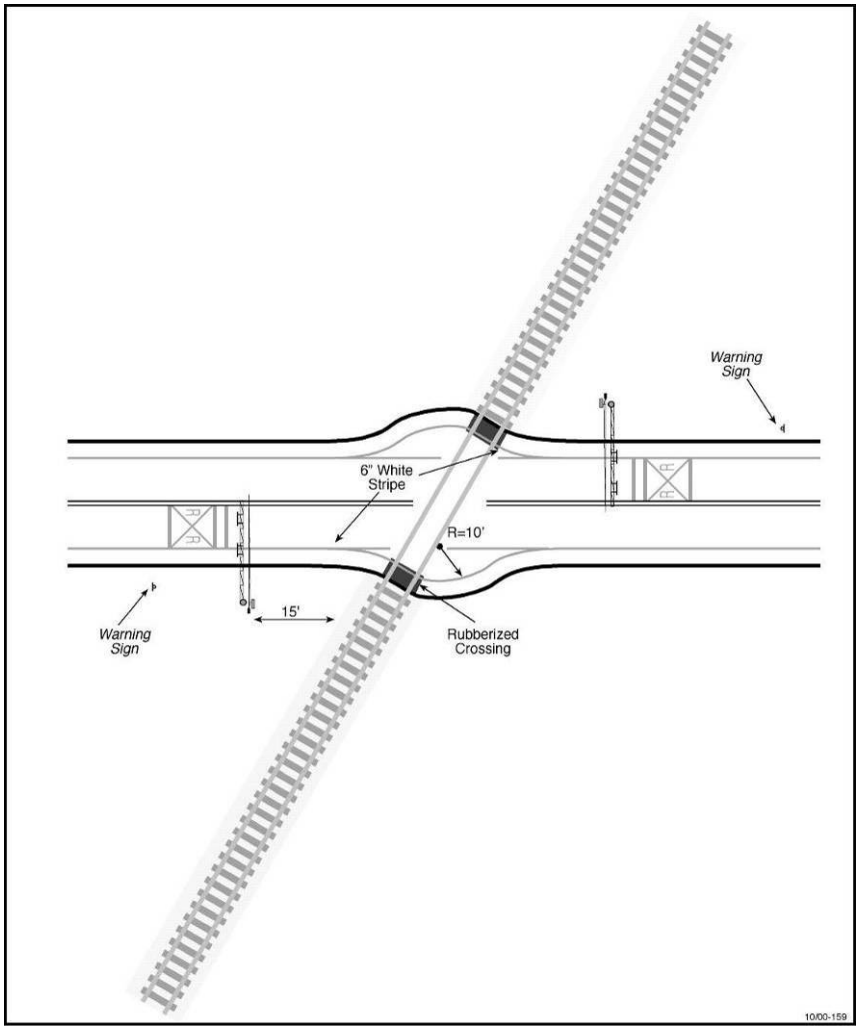


Figure A-13 - Bike Lanes Crossing at Railroad Tracks

A.4. Class III Bikeway Design

Generally referred to as a "bike route," a Class III bikeway provides routes through areas not served by Class I or II facilities or to connect discontinuous segments of a bikeway.

Class III facilities can be shared with either motorists on roadways or pedestrians on a sidewalk (not advisable) and is identified only by signing. There are no recommended minimum widths for Class III facilities, but when encouraging bicyclists to travel along selected routes, traffic speed and volume, parking, traffic control devices, and surface quality should be acceptable for bicycle travel. Although it is not a requirement, a wide outside traffic lane (14 feet) is typically preferable to enable cars to safely pass bicyclists without crossing the centerline. Caltrans Chapter 1000 provides details regarding the design requirements for placement and spacing of bicycle route signage.

A.5. On-Street Regulatory & Warning Bike Signs

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. Signage should be installed on existing signposts if possible, reducing visual clutter along the path or roadway. **Figure A-14 – Standard CA MUTCD Bicycle Signs** shows standard bicycle signs in the CA MUTCD.

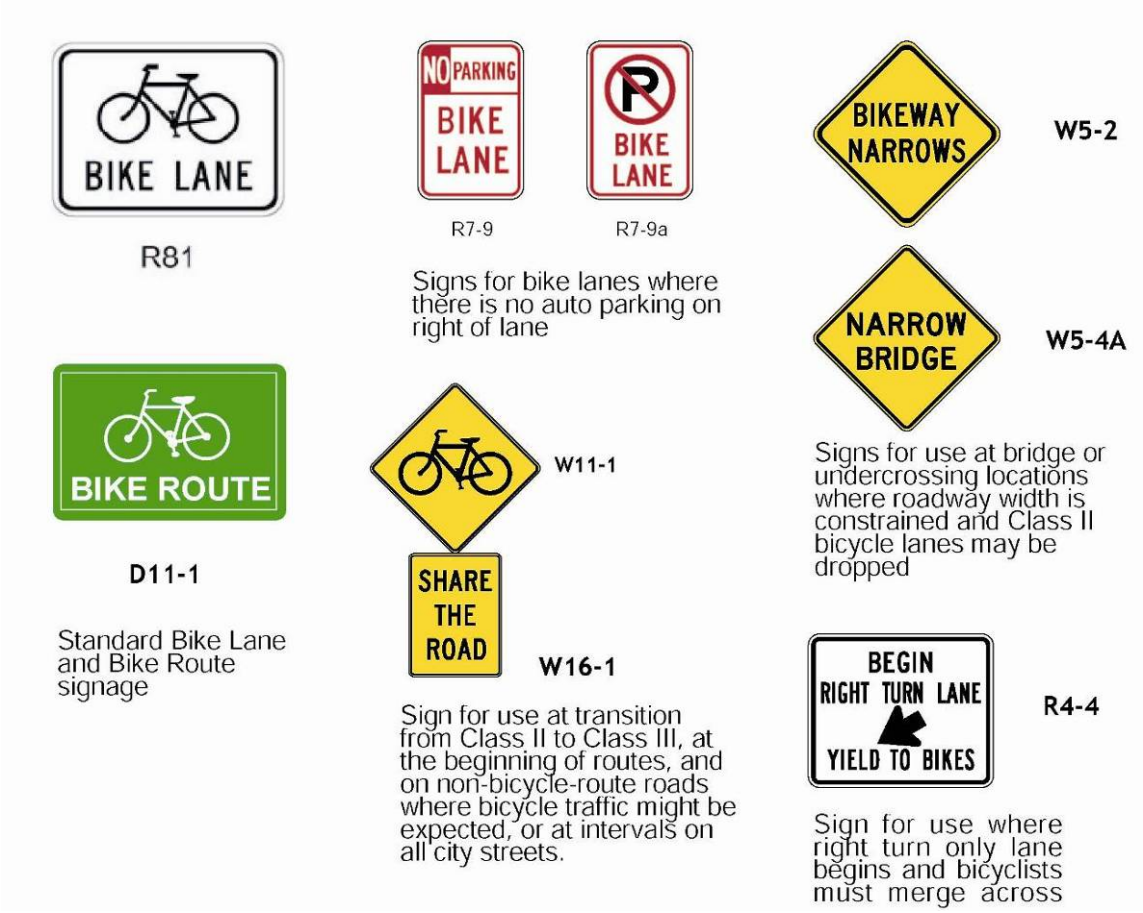


Figure A-14 – Standard CA MUTCD Bicycle Signs

A.6. Innovative Bikeway Treatments

A.6.1. Bicycle Boulevards

Bicycle Boulevards have been implemented in numerous locations including Berkeley, Palo Alto and Davis California, and Portland, Oregon. A Bicycle Boulevard, also known as bicycle priority road, is a roadway that allows all types of vehicles, but which has been modified to enhance bicycle safety and security. Roadways are designed to be places where cars and bicycles can equally share right-of-way. Bicycle Boulevards tend to be residential streets with lower traffic volumes, typically between 3000 to 5000 average daily vehicles, but can include secondary commercial streets.

Figure A-15 - Bicycle Boulevard Lane Configuration shows the typical design features of bicycle boulevards, these include:

- Traffic calming devices such as traffic circles and curb bulbouts
- Bicycle destination signage
- Pavement stencils indicating status as a Bicycle Boulevard
- Crossing improvements at major arterials such as traffic signals with bicycle-detection, four-way stops and high-visibility crosswalks
- Bicycle-friendly signal preemption at high-volume signalized intersections.
- Stop signs on streets crossing the Bicycle Boulevard

Bicycle Boulevards can be designed to accommodate the particular needs of the residents and businesses along the routes, and may be as simple as pavement markings with wayfinding signs or as complex as streets with traffic diverters and bicycle signals. Many good candidates for Bicycle Boulevards may benefit most from signage and public education. Substantial capital improvements may not be necessary.

A bicycle boulevard sign in Berkeley, CA

To further identify a street as a preferred bicycle route, lower volume roadways may be modified to function as a through street for bicycles, while maintaining only local access for automobiles. Traffic calming devices can lower traffic speeds and through trips, limiting conflicts between motorists and bicyclists and providing priority to through bicycle movement. shows an example configuration for a bicycle boulevard.

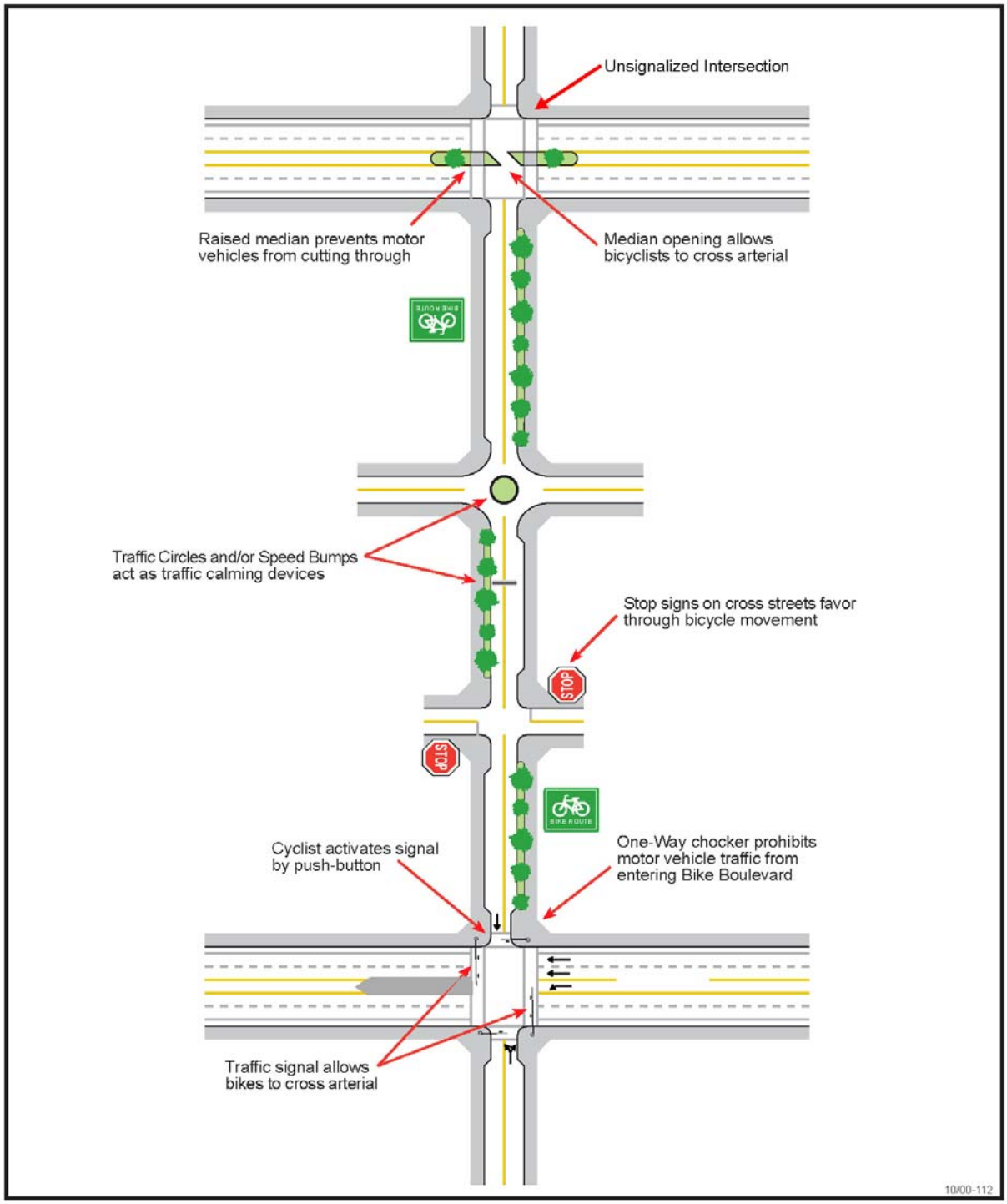


Figure A-15 - Bicycle Boulevard Lane Configuration

A.6.2. Shared Roadway Bicycle Marking

Recently, Shared Lane Marking stencils have been introduced for use in California as an additional treatment for Class III facilities. The stencil can serve a number of purposes, such as making motorists aware of bicycles potentially in their lane, showing bicyclists the direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent "dooring" collisions.

Figure A-16 - Shared Lane Marking Placement and Shared Roadway Bicycle Marking illustrates recommended placement of the stencil in the roadway and the "Chevron" marking design recommended by Caltrans. Caltrans adopted the following pavement markings for official use in 2005 as part of the CA MUTCD.

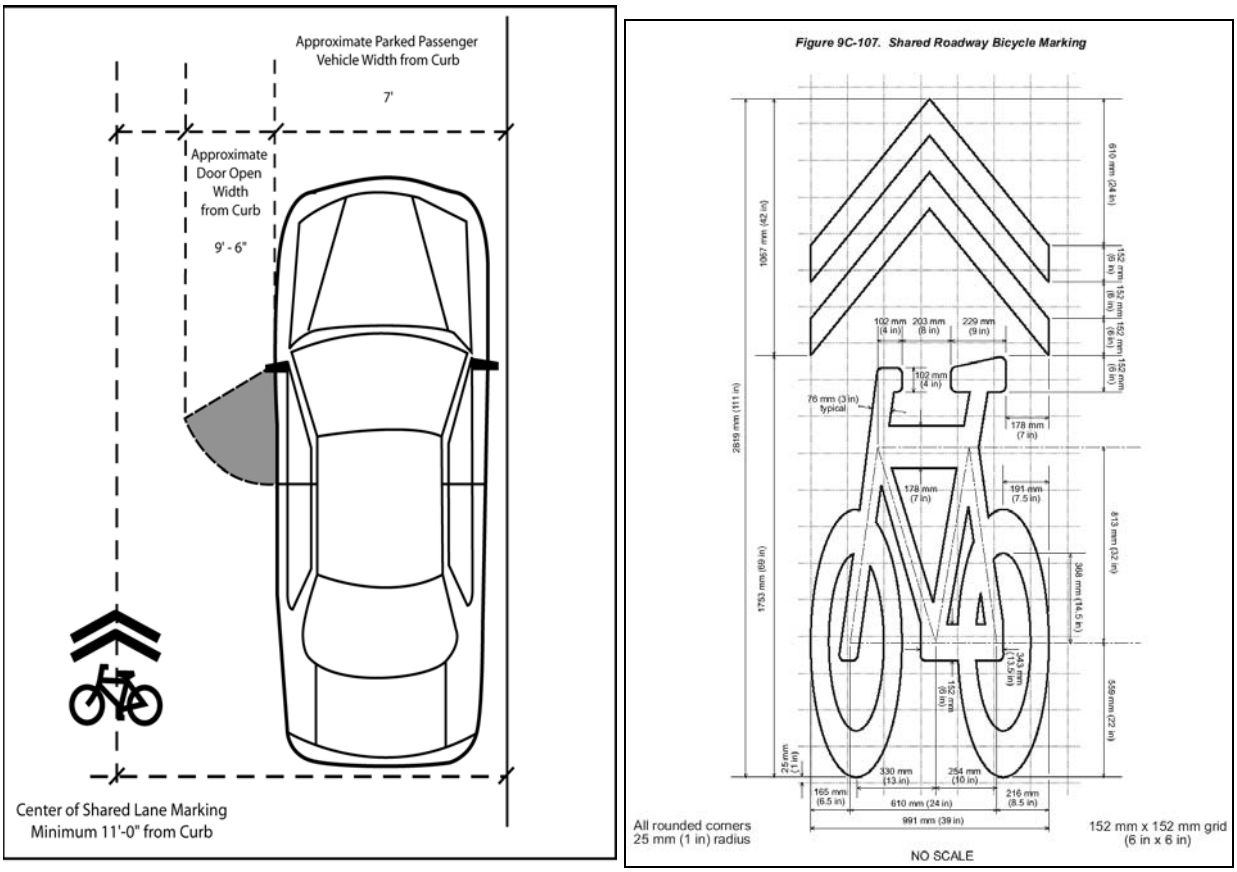


Figure A-16 - Shared Lane Marking Placement and Shared Roadway Bicycle Marking

A.7. Signage and Wayfinding

A.7.1. Wayfinding

As recommended for the Midtown Core in Chapter 6, wayfinding signage is an important part of the bicycle network. **Figure A-17 - Proposed Milpitas Wayfinding Signage** shows two sign options for the network. Signs such as these improve the clarity of travel while illustrating that destinations are really only a short ride away. The first sign is Milpitas specific and includes the Milpitas BPAC logo. Included on the sign are destinations and travel length to the destinations. Approximate time to the destination is also possible to include on this sign unique to Milpitas. The alternative is an experimental sign proposed for the MUTCD. The color of these signs resemble vehicle signs and have a bicycle to denote that they are for bicycles. These signs are currently installed in Chicago as well as some other cities in the US. These signs may be a MUTCD standard in the future.

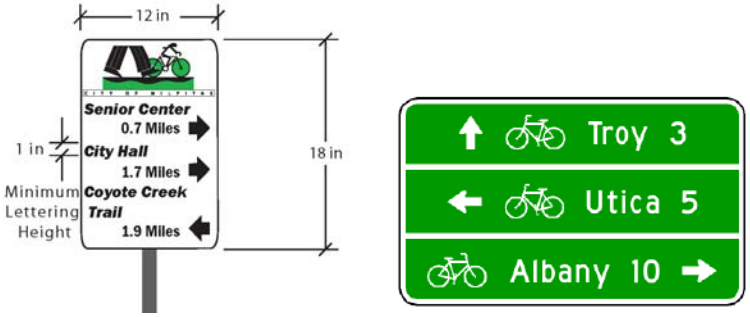


Figure A-17 - Proposed Milpitas Wayfinding Signage

A.7.2. Bike Route Signage

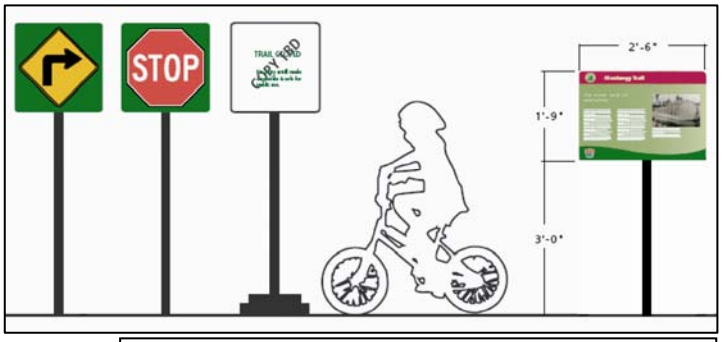
Figure A-18 – Bicycle Route Number Marker

In addition to wayfinding signs, bike route network signage is recommended for Milpitas and the CA MUTCD standard for these signs should be used in the City. Route numbering for these signs should be coordinated with neighboring jurisdictions where bikeways cross the City's boundary. Most commonly, they show the route number and the corresponding direction.

For bike route signs, CA MUTCD requires a green background and white lettering. The top portion of the sign is customizable for the city or region where it located. For example, the City of San Francisco shows the Golden Gate Bridge on its bike route signs. **Figure A-18 – Bicycle Route Number Marker** shows an example from San Francisco.

A.7.2.1. Multi-Use Path Signs

The City of Milpitas' Transportation Department and the Parks and Recreation Department should work together to create a sign system for the multi-use path network through the City. It is an expanding network that could link with many destinations citywide. Signs could show destinations as well as proper traffic control.



These signs could be coordinated with the wayfinding signs in Midtown as well as on-street bicycle route signage. This system should encourage use of trails for recreational as well as functional bicycling trip-purposes. Helping bicyclists of all ages reach destinations easily.

A.7.3. Wrong-Way Signs

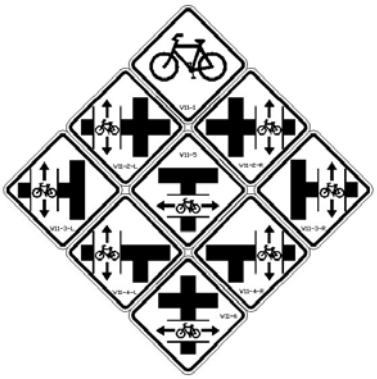
The City may want to consider additional signage on bikeways with high levels of wrong-way riding. The City of Sunnyvale, places wrong way riding signs on the back of bike lane signs to help prevent bicyclists using bicycle lanes in the wrong direction, riding against traffic. The City of Milpitas may want to consider installing similar signs on bikeways where there is wrong-way riding.

Wrong-Way Signs in Sunnyvale

A.7.4. Parallel Path Warning Signage

When paths are located parallel and adjacent to roadways, vehicles turning into and out of streets and driveways must cross the path. Conflicts between bicyclists and pedestrians and turning motorists are common at these types of intersections. Turning motor vehicles do not expect to see bicyclists or pedestrians coming in the opposite direction of traffic.

Starting in the early 1990's, the City of Denver, Colorado began using experimental warning signage at its parallel paths. The signage is



An example of Denver's parallel path warning signage

An example of Denver's parallel path warning signage in context

modified from the standard MUTCD railroad warning signage.

Experimental signage, similar to the Denver parallel path warning signs, could help alert motorists to the presence of bicyclists and pedestrians on parallel paths.

A.8. Bicycle Parking

As more bikeways are constructed and bicycle usage grows, the need for bike parking will increase. Short-term parking at shopping centers and similar land uses can support bicycling as well as long-term bicycle parking at transit stations and work sites.

A.8.1. Guidelines for Locating Bicycle Parking

Bicycle parking should be installed on public property, or available to private entities on an at-cost basis. Bicycle parking facilities should be provided at public destinations, including government buildings, community centers, parks, schools and shopping centers.

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. 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. **Figure A-19 - Recommended Guidelines for Bicycle Parking Locations and Quantities** provides basic guidelines on ideal locations for parking at several key activity centers as well as an optimum number of parking spaces. Currently Milpitas zoning states that the number of bicycle parking stalls should equal five percent of automobile parking stalls.

Land Use or Location	Physical Location	Bicycle Capacity
City Park	Adjacent to restrooms, picnic areas, fields, and other attractions	8 bicycles per acre
City Schools	Near office entrance with good visibility	8 bicycles per 40 students
Public Facilities (city hall, libraries, community centers)	Near main entrance with good visibility	8 bicycles per location
Commercial, retail and industrial developments over 10,000 gross square feet	Near main entrance with good visibility	1 bicycle per 15 employees or 8 bicycles per 10,000 gross square feet
Shopping Centers over 10,000 gross square feet	Near main entrance with good visibility	8 bicycles per 10,000 gross square feet
Commercial Districts	Near main entrance with good visibility; not to obstruct auto or pedestrian movement	2 bicycles every 200 feet
Transit Stations	Near platform or security guard	1 bicycle per 30 parking spaces

Figure A-19 - Recommended Guidelines for Bicycle Parking Locations and Quantities

A.8.2. Short Term Bicycle Parking

Short term bicycle parking facilities are best used to accommodate visitors, customers, messengers and others expected to depart within two hours. Bicycle racks provide support for the bicycle but do not have locking mechanisms. Racks are relatively low-cost devices that typically hold between two and eight bicycles, allow bicyclists to securely lock their frames and wheels, are secured to the ground, and are located in highly visible areas. They are usually located at schools, commercial locations, and activity centers such as parks, libraries, retail locations, and civic centers. See **Figure A-20 - Recommended Short-Term Bicycle Parking Facilities**.

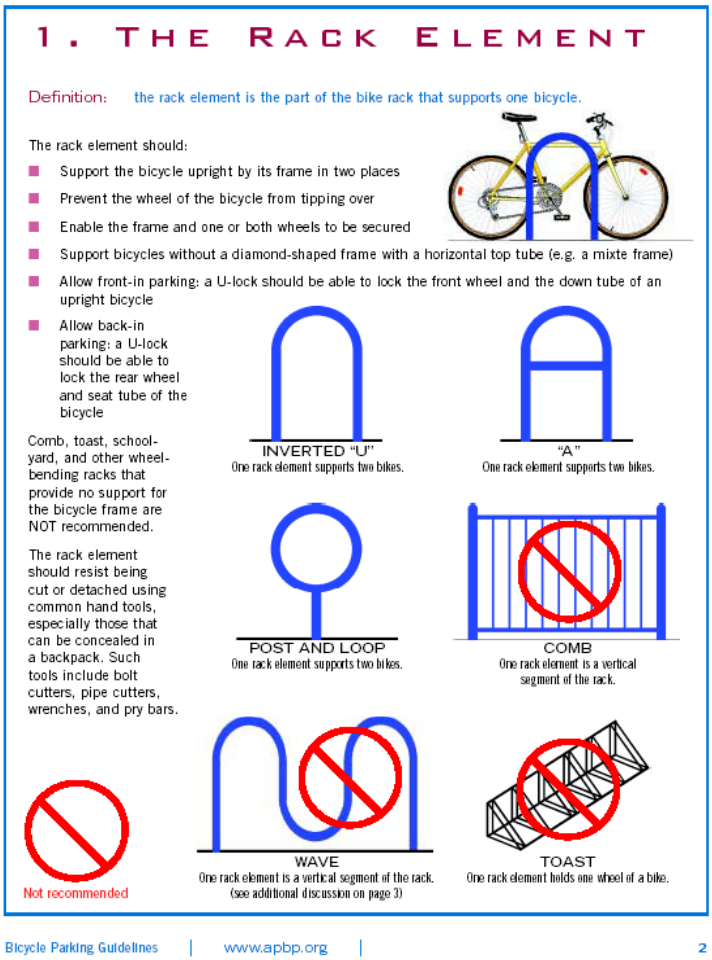
Bicycle racks should be installed with the following guidelines in mind:

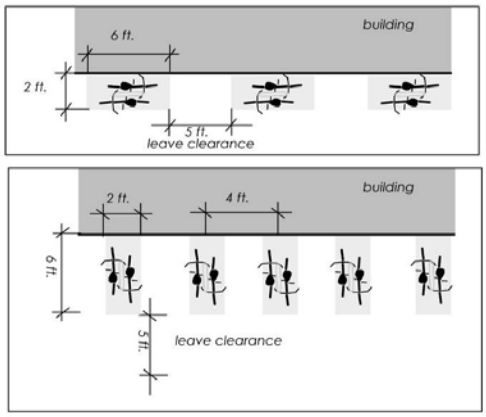
- The rack element (part of the rack that supports the bike) should keep the bike upright, supporting the frame in two places and allowing one or both wheels to be secured.
- Install racks so there is enough room between adjacent parked bicycles. If it becomes too difficult for a bicyclist to easily lock their bicycle, they may park elsewhere. A row of inverted "U" racks should be installed with 15 inches minimum between racks.
- Empty racks should not pose a tripping hazard for visually impaired pedestrians. Position racks out of the walkway's clear zone.

When possible, racks should be in a covered area protected from the elements. Long-term parking should always be protected.

Generally, 'U' type racks bolted into the sidewalk are preferred and should be located intermittently or in front of key destinations. Bicycle racks should be installed to meet ADA standards and not block pedestrian through traffic.

The City may want to consider custom racks that can serve not only as bike racks, but also public artwork or as advertising for a specific business. The "post and ring" style rack is an attractive alternative to the standard inverted-U, which requires only a single mounting point and can be customized to have the city name or emblem stamped into the rings. These racks can also be easily retrofitted onto existing street posts, such as parking meter posts. While custom racks can add a decorative element and relate to a neighborhood theme, the rack function should not be overlooked: All racks should adhere to the basic functional requirement of supporting the bicycle by the frame (not only the wheel) and accepting a U-lock.





Recommended bicycle parking spacing dimensions

Figure A-20 - Recommended Short-Term Bicycle Parking Facilities

Possible alternatives to the inverted-U bike rack include a custom artistic rack (left) or the abstract rack (right) . All styles allow the bicycle to be secured by the frame with a U-lock.

A.8.3. Long Term Bicycle Parking

For long-term parking, the city may want to consider bicycle lockers. Bicyclists are usually more comfortable storing bicycles in lockers for long periods because they offer increased security and

protection from natural elements. Although they may be more expensive to install, they can make the difference for commuters deciding whether or not to bicycle.

Lockers can be controlled with traditional key systems or through more elaborate subscription systems. Subscription locker programs, like e-lockers, or park-by-phone systems allow even more flexibility within locker use. Instead of restricting access for each patron to a single locker, subscribers can gain access to all lockers within a system, controlled by magnetic access cards, or caller ID. These programs typically have fewer administrative costs because they simplify or eliminate key management and locker assignment.

Long-term bicycle parking facilities accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking, as shown in **Figure A-21 - Recommended Long-Term Bicycle Parking Facilities** should be provided in a secure, weather-protected manner and location.

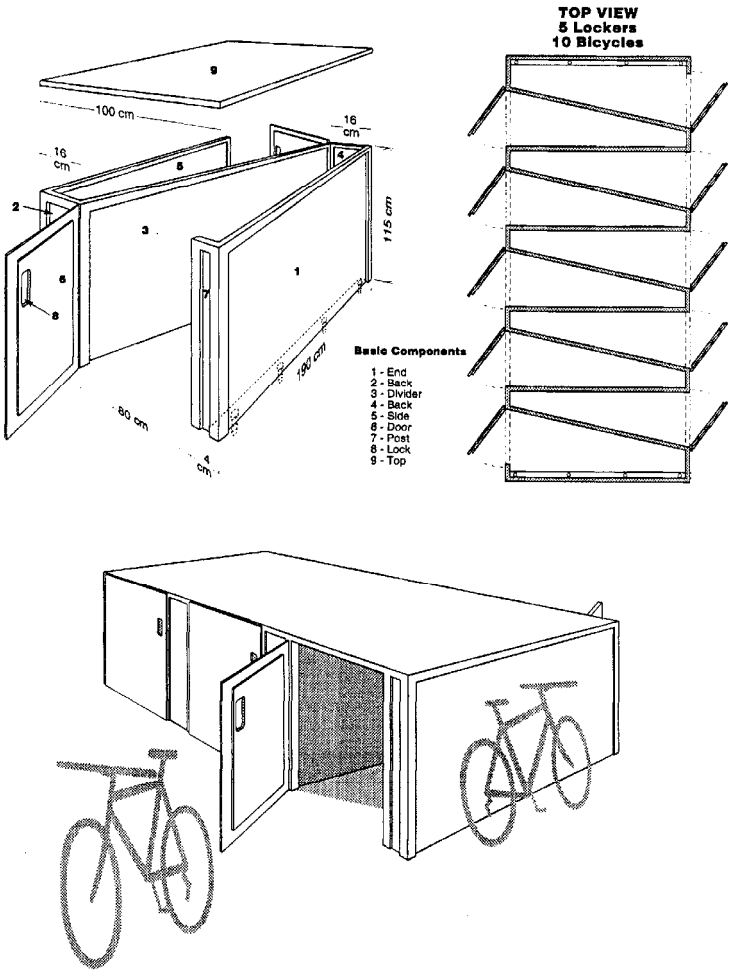


Figure A-21 - Recommended Long-Term Bicycle Parking Facilities

Bike Corral in Portland, Oregon

A.8.4. Innovative High Volume Bicycle Parking

In many locations, individual U-racks located on the sidewalk can be sufficient to meet bicycle parking demand. Where bicycle parking demand is higher, more formal structures and larger facilities need to be provided. Several options for high-volume bicycle parking are outlined below.

A.8.4.1. On-Street Bike Parking Corral

A relatively inexpensive solution to providing high-volume bicycle parking is to convert one or two on-street motor vehicle parking spaces into on-street bicycle parking. Bike racks are installed in the street and protected from motor vehicles with removable curbs and bollards. These Bike Parking Corrals move bicycles off the sidewalks, and leave space for sidewalk café tables or pedestrians. Bicycle parking does not block sightlines like motor vehicles do, so it may be possible to locate bicycle parking in no-parking zones near intersections and crosswalks.

Bike Oasis installed in Portland, OR near NE 43rd and Hancock

A.8.4.2. Bike Oasis

In 2008, the City of Portland, Oregon began installation of several "Bike Oases" in commercial districts. These signature bicycle parking facilities are installed on curb extensions and consist of attractive covered bike parking and an information panel. Portland's Bike Oases provide parking space for ten bikes. Bike and walking maps are installed on the information panel.

Mayor Daley of Chicago at the ribbon-cutting ceremony for Chicago's Millennium Bicycle Station
Photo: Chicagoland Bicycle Federation

A.8.4.3. Bike Stations

Bike stations serve as one-stop bicycle service centers for bicycle commuters. They include 24-hour secure bicycle parking and may provide additional amenities such as a store to purchase items (helmets, raingear, tubes, patch kits, bike lights, and locks), bicycle repair facilities, showers and changing facilities, bicycle rentals, and information about biking. Some bike stations provide free bike parking, while others charge a fee or require membership.

Bike stations have been installed in several cities in California, including Long Beach, San Francisco, Los Angeles and Berkeley, as well as Chicago, Illinois and Seattle, Washington. Most commonly, they are installed at transit stations.

A.8.4.4. Valet Bike Parking

The City of Milpitas partners with its Bicycle Pedestrian Advisory Committee and Silicon Valley Bicycle Coalition to provide valet bike parking at City festivals and other community events. Indoor locations for storing bicycles should be designed into venues that host sporting events, festivals, and other events where large numbers of people gather.

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B. Tier 1 Priority Project Cost Estimates

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Project Number 1

Name	Start	Stop	Length	Improvement Type	Class
N Abel Street	Redwood Ave	Corning Ave	1.07	Arterial Connection	II

Item	Description	Est. Quant.	Units	Unit Price	Total
1	MOBILIZATION (10%)	1	LS	$ 3,968.00	$ 3,968
2	DEMOLITION (STRIPING REMOVAL)	1	LF	$ -	$ -
3	STRIPING	11,300	LF	$ 2.00	$ 22,600
4	PAVEMENT MARKINGS - MILPITAS BIKE LANE SYMBOL	49	EA	$ 70.00	$ 3,430
5	BICYCLE STENCILS AT SIGNAL INTERSECTIONS	14	EA	$ 100.00	$ 1,400
6	POST SIGNAGE	49	EA	$ 250.00	$ 12,250
7	ASPHALT CONCRETE	1	TON	$ -	$ -
	Subtotal				$ 43,648
	Contingency (35%)				$ 15,277
	Subtotal				$ 58,925
	Design				$ 8,839
	Grand Total				$ 67,764

Notes:

1 Class II: 5' bike lanes, Bicycle detector symbol at signalized intersections
2 Assume 1.07 miles long
3 7 signalized intersections
4 Milpitas Bike Lane symbol - 14 sqft @ $5/sqft
5 Stencils - 20 sqft @ $5/sqft

Signalized Intersections

Redwood
Marilynn
Weller
Calaveras
Serra Way
Junipero
Corning

Project Number 2

Name	Start	Stop	Length	Improvement Type	Class
Arizona Ave	Manfred St	Jacklin Rd	0.89	Neighborhood Connections	III

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	1	LS	$ 1,785.00	$ 1,785
2	**DEMOLITION (STRIPING REMOVAL)**	1	LF	$ -	$ -
3	**STRIPING**	1	LF	$ -	$ -
4	**PAVEMENT MARKINGS - SHARROWS**	51	EA	$ 100.00	$ 5,100
5	**BICYCLE DETECTOR SIGNS**	1	EA	$ -	$ -
6	**POST SIGNAGE**	51	EA	$ 250.00	$ 12,750
7	**ASPHALT CONCRETE**	1	TON	$ -	$ -
	Subtotal				$ 19,635
	Contingency (35%)				$ 6,872
	Subotal				$ 26,507
	Design				$ 3,976
	Grand Total				$ 30,483

Notes:

1 Class III: Shared Roadway bicycle markings after intersections
Shared Roadway markings every 250'

2 Assume 0.89 miles long

3 19 intersections @ 2 sharrows per intersection

4 Sharrow: 20 sqft @ $5.00/sqft

Intersections - heading north from Jacklin	Markings Needed
Jacklin - 1N, 1S (south facing symbol on north side of intersection)	2
Oregon Way (west side only) - 1N, 1S	2
Berrendo Dr. (west side only) - 1S	1
Midwick Dr. (west side only) - 1S	1
Vienna Dr. (west side only) - 1S	1
Rose Dr./Garcia Ct. 1N, 1S	2
Duarte Ct. (east side only) - 1N	1
Washington Dr. - 1N, 1S	2
Valmy St. - 1N, 1S	2
Coelho St. - 1N, 1S	2
Hazen St (east side only) - 1N	1
Boyd St. (east side only) - 1N	1
Boulder St. (east side only) - 1N	1
Dixon Rd. - 1N, 1S	2
Mazey St. (east side only) - 1N	1
Autrey St. (east side only) - 1N	1
Callan St. (east side only) - 1N	1
Tiny St. (east side only) - 1N	1
Manferd St. (east side only) - 1N	1
Heading North: 8 from Jacklin to Garcia Ct	8
Heading North: 2 from Boulder to Dixon	2
Heading South: 5 from Manferd to Dixon	5
Heading South: 5 from Dixon to Coelho	5
Heading South: 1 from Washington to Rose	1
Heading South: 3 from Vienna to Midwick	3
Heading South: 1 from Berrendo to Oregon	1
	51

Project Number 3

Name	Start	Stop	Length	Improvement Type	Class
N Park Victoria Dr	Jacklin Rd	Calaveras I	0.86	Vehicle Lane Reduction	II

Item	Description	Est. Quant.	Units	Unit Price	Total
1	MOBILIZATION (10%)	1	LS	$ 7,316.40	$ 7,316
2	DEMOLITION (STRIPING REMOVAL)	13,624	LF	$ 1.50	$ 20,436
3	STRIPING	18,164	LF	$ 2.00	$ 36,328
4	PAVEMENT MARKINGS - MILPITAS BIKE LANE SYMBOL	50	EA	$ 70.00	$ 3,500
5	BICYCLE STENCILS AT SIGNAL INTERSECTIONS	4	EA	$ 100.00	$ 400
6	POST SIGNAGE	50	EA	$ 250.00	$ 12,500
7	ASPHALT CONCRETE	1	TON	$ -	$ -
	Subtotal				$ 80,480
	Contingency (35%)				$ 28,168
	Subtotal				$ 108,649
	Design				$ 16,297
	Grand Total				$ 124,946

Notes:

1 Class II: 5' bike lanes, Bicycle detector symbol at signalized intersections
2 Assume 0.86 miles long
3 2 signalized intersections
4 Milpitas Bike Lane symbol - 14 sqft @ $5/sqft
5 Stencil: 20 sqft @ $5/sqft

Project Number 4

Name	Start	Stop	Length	Improvement Type	Class
Calaveras Blvd	S Park Victoria Dr	McCarthy	1.52	Route Arterial Connection	III

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	1	LS	$ 1,875.00	$ 1,875
2	**DEMOLITION (STRIPING REMOVAL)**	1	LF	$ -	$ -
3	**STRIPING**	1	LF	$ -	$ -
4	**PAVEMENT MARKINGS - SHARROWS**	1	EA	$ -	$ -
5	**BICYCLE DETECTOR SIGNS**	1	EA	$ -	$ -
6	**POST SIGNAGE**	75	EA	$ 250.00	$ 18,750
7	**ASPHALT CONCRETE**	1	TON	$ -	$ -
	Subtotal				$ 20,625
	Contingency (35%)				$ 7,219
	Subtotal				$ 27,844
	Design				$ 4,177
	Grand Total				$ 32,020

Notes:

1 Class III: Shared Roadway bicycle markings after intersections
Shared Roadway markings every 250'

2 Assume 1.52 miles long

3 Signage only

Project Number 5

Name	Start	Stop	Length	Improvement Type	Class
Temple Drive	Yosemite Dr	Kennedy I	1.01	Neighborhood Connections	III

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	1	LS	$ 1,575.00	$ 1,575
2	**DEMOLITION (STRIPING REMOVAL)**	1	LF	$ -	$ -
3	**STRIPING**	1	LF	$ -	$ -
4	**PAVEMENT MARKINGS - SHARROWS**	45	EA	$ 100.00	$ 4,500
5	**BICYCLE DETECTOR SIGNS**	1	EA	$ -	$ -
6	**POST SIGNAGE**	45	EA	$ 250.00	$ 11,250
7	**ASPHALT CONCRETE**	1	TON	$ -	$ -
	Subtotal				$ 17,325
	Contingency (35%)				$ 6,064
	Subtotal				$ 23,389
	Design				$ 3,508
	Grand Total				$ 26,897

Notes:

1 Class III: Shared Roadway bicycle markings after intersections
Shared Roadway markings every 250'
2 Assume 1.01 miles long
3 15 intersections
4 Sharrow: 20 sqft @ $5.00/sqft

Intersections - heading North from Yosemite

1	Yosemite - 1N, 1S (south facing symbol on north side of intersection)	2
2	Edsel Dr. - 1N, 1S	2
3	Wylie Dr. (east side only) - 1N	1
4	Canton Dr. - 1N, 1S	2
5	Burley Dr. - 1N, 1S	2
6	Jupiter Dr./Mirabella Ct. - 1N, 1S	2
7	Calaveras Blvd - 1N, 1S	2
8	Adams Ave. (west side only) - 1S	1
9	Strawberry Ln. (east side only) - 1N	1
10	Golden Hills Dr. (east side only) - 1N	1
11	Dennis Ave. - 1N, 1S	2
12	View Dr. (east side only) - 1N	1
13	Arana Ct. (east side only) - 1N	1
14	Fairhill Dr. (east side only) - 1N	1
15	Kennedy Dr. - 1N, 1S (north facing symbol on south side of intersection)	2
16	Heading North: 2 from Edsel to Wylie	2
17	Heading North: 2 from Wylie to Canton	2
18	Heading North: 2 from Canton to Burley	2
19	Heading North: 2 from Calaveras to Strawberry	2
20	Heading South: 4 from Kennedy to Dennis	4
21	Heading South: 3 from Dennis to Adams	3
22	Heading South: 2 from Burley to Canton	2
23	Heading South: 5 from Canton to Edsel	5
		45

Project Number 6

Name	Start	Stop	Length	Improvement Type	Class
Sequoia Dr	Yellowstone Ave	Yosemite Dr	0.33	Neighborhood Connections	III

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	1	LS	$ 560.00	$ 560
2	**DEMOLITION (STRIPING REMOVAL)**	2	LF	$ -	$ -
3	**STRIPING**	1	LF	$ -	$ -
4	**PAVEMENT MARKINGS - SHARROWS**	16	EA	$ 100.00	$ 1,600
5	**BICYCLE DETECTOR SIGNS**	1	EA	$ -	$ -
6	**POST SIGNAGE**	16	EA	$ 250.00	$ 4,000
7	**ASPHALT CONCRETE**	1	TON	$ -	$ -
	Subtotal				$ 6,160
	Contingency (35%)				$ 2,156
	Subtotal				$ 8,316
	Design				$ 1,247
	Grand Total				$ 9,563

Notes:

1 Class III: Shared Roadway bicycle markings after intersections
Shared Roadway markings every 250'
2 Assume 0.33 miles long
3 8 intersections
4 Sharrow: 20 sqft @ $5.00/sqft

Intersections - heading north from yellowstone

Yellowstone - 1N, 1S (South facing symbol on the north side of intersection)	2
Grand Teton Dr. - 1N, 1S	2
Mt. Rainier Dr.(west side only) - 1S	1
Everglades Dr. - 1N, 1S	2
Crater Lake Ave. - 1N, 1S	2
Big Bend Dr. - 1N, 1S	2
Shenandoah Ave. - 1N, 1S	2
Yosemite Dr. - 1N, 1S (North facing symbol on the south side of intersection)	2
Heading north: 1 from Grand Teton to Everglades	1
	16

Project Number 7

Name	Start	Stop	Length	Improvement Type	Class
Dempsey Rd	S Park Victoria Dr	Montague Expy/ Landess Ave	1.61	Route Arterial Connection	III

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	**1**	**LS**	**$ 2,730.00**	**$ 2,730**
2	**DEMOLITION (STRIPING REMOVAL)**	**1**	**LF**	**$ -**	**$ -**
3	**STRIPING**	**1**	**LF**	**$ -**	**$ -**
4	**PAVEMENT MARKINGS - SHARROWS**	**78**	**EA**	**$ 100.00**	**$ 7,800**
5	**BICYCLE DETECTOR SIGNS**	**1**	**EA**	**$ -**	**$ -**
6	**POST SIGNAGE**	**78**	**EA**	**$ 250.00**	**$ 19,500**
7	**ASPHALT CONCRETE**	**1**	**TON**	**$ -**	**$ -**
	Subtotal				**$ 30,030**
	Contingency (35%)				**$ 10,511**
	Subtotal				**$ 40,541**
	Design				**$ 6,081**
	Grand Total				**$ 46,622**

Notes:

1 Class III: Shared Roadway bicycle markings after intersections
Shared Roadway markings every 250'
2 Assume 1.61 miles long
3 8 intersections
4 Sharrow: 20 sqft @ $5.00/sqft

Intersections - heading north - all roads from the west, UNO

Landess - 1N, 1S	2
French Ct. - 1N	1
Cuciz Ln. - 1N	1
David Ln. - 1N	1
Chewpon Ave. - 1N	1
Mt. Shasta Ave. - 1N	1
Creighton Ct - 1N	1
Aberfeldy Way - 2N	2
Yosemite Dr. - 1N, 1S	2
Edsel Dr. - 1N	1
Shirley Dr. - 1N	1
Selwyn Dr. - 2N	2
Dempsey Way - 1S	1
S Park Victoria - 1N, 1S	2
Heading North: 1 from Landess to French Ct	1
Heading North: 2 from David to Chewpon	2
Heading North: 1 from Chewpon to Mt Shasta	1
Heading North: 3 from Mt Shasta to Creighton Ct	3
Heading North: 2 from Aberfeldy to Yosemite	2
Heading North: 6 from Yosemite to Edsel	6
Heading North: 1 from Edsel to Shirley	1
Heading North: 5 from Shirley to S. Park Victoria	5
Heading South: 1 from SPV to Dempsey Way	1
Heading South: 16 from Dempsey Way to Yosemite	16
Heading South: 21 from Yosemite to Landess	21
	78

Project Number 8

Name	Start	Stop	Length	Improvement Type	Class
S Park Victoria Dr	Mt Shasta Ave	Yosemite Dr	0.44	Arterial Connection	II

Item	Description	Est. Quant.	Units	Unit Price	Total
1	MOBILIZATION (10%)	1	LS	$ 1,663.60	$ 1,664
2	DEMOLITION (STRIPING REMOVAL)	1	LF	$ -	$ -
3	STRIPING	4,648	LF	$ 2.00	$ 9,296
4	PAVEMENT MARKINGS - MILPITAS BIKE LANE SYMBOL	22	EA	$ 70.00	$ 1,540
5	BICYCLE STENCILS AT SIGNAL INTERSECTIONS	3	EA	$ 100.00	$ 300
6	POST SIGNAGE	22	EA	$ 250.00	$ 5,500
7	ASPHALT CONCRETE	1	TON	$ -	$ -
	Subtotal				$ 18,300
	Contingency (35%)				$ 6,405
	Subtotal				$ 24,704
	Design				$ 3,706
	Grand Total				$ 28,410

Notes:

1 Class II: 5' bike lanes, Bicycle detector symbol at signalized intersections
2 Assume 0.44 miles long
3 2 signalized intersections
4 Milpitas Bike Lane symbol - 14 sqft @ $5/sqft
5 Stencil: 20 sqft @ $5/sqft

Project Number 9

Name	Start	Stop	Length	Improvement Type	Class
Landess Ave	I-680Ramp	Piedmont Rd	1.01	Route Arterial Connection	III

Item	Description	Est. Quant.	Units	Unit Price	Total
1	MOBILIZATION (10%)	1	LS	$ 500.00	$ 500
2	DEMOLITION (STRIPING REMOVAL)	1	LF	$ -	$ -
3	STRIPING	1	LF	$ -	$ -
4	PAVEMENT MARKINGS - SHARROWS	1	EA	$ -	$ -
5	BICYCLE DETECTOR SIGNS	1	EA	$ -	$ -
6	POST SIGNAGE	20	EA	$ 250.00	$ 5,000
7	ASPHALT CONCRETE	1	TON	$ -	$ -
	Subtotal				$ 5,500
	Contingency (35%)				$ 1,925
	Subtotal				$ 7,425
	Design				$ 1,114
	Grand Total				$ 8,539

Notes:

1 Class III: Shared Roadway bicycle markings after intersections
Shared Roadway markings every 250'

2 Assume 1.52 miles long

3 Signage only

Project Number 10

Name	Start	Stop	Length	Improvement Type	Class
Calera Creek Trail	Milpitas Blvd	I-680	0.97	Path Network	I

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	1	LS	$ 52,116.00	$ 52,116
2	**SWPPP (Preparation and Implementation, 10%)**	1	LS	$ 26,058.00	$ 26,058
3	**PAVEMENT MARKINGS - SHARROWS**	1	EA	$ -	$ -
4	**BICYCLE DETECTOR SIGNS**	1	EA	$ -	$ -
5	**ASPHALT CONCRETE (3")**	1,883	TON	$ 120.00	$ 225,960
6	**ACTUATED PED. CROSSINGS**	2	EA	$ 40,000.00	$ 80,000
7	**STORM MITIGATION (See Note 6)**	1	EA	$ 85,000.00	$ 85,000
8	**AGGREGATE BASE (Class 2, 6")**	1,860	CY	$ 70.00	$ 130,200
	Subtotal				$ 599,334
	Contingency (35%)				$ 209,767
	Subtotal				$ 809,101
	Design				$ 121,365
	Grand Total				$ 930,466

Notes:

1 Class I: 10 feet wide with two 2 foot shoulders
2 Assume .97 miles long
3 AC: 14' x 7172' x (3/12)' x 150#/CF / 2000#/ton
4 AB: 14' x 7172' x (6/12)' / 27CF/CY
5 1 side trail from Milpitas to Escuela: 3072'
2 side trail from Escuela to I-680: 2050' each
6 May not be required by Regional Water Quality Control Bd.

Project Number 11

Name	Start	Stop	Length	Improvement Type	Class
Yellowstone Ave	S Park Victoria Dr	Landess Ave	0.86	Neighborhood Connections	III

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	1	LS	$ 1,540.00	$ 1,540
2	**STRIPING**	1	LF	$ -	$ -
3	**PAVEMENT MARKINGS - SHARROWS**	44	EA	$ 100.00	$ 4,400
4	**BICYCLE DETECTOR SIGNS**	1	EA	$ -	$ -
5	**POST SIGNAGE**	44	EA	$ 250.00	$ 11,000
6	**ASPHALT CONCRETE**	1	TON	$ -	$ -
	Subtotal				$ 16,940
	Contingency (35%)				$ 5,929
	Subtotal				$ 22,869
	Design				$ 3,430
	Grand Total				$ 26,299

Notes:

1 Class III: Shared Roadway bicycle markings after intersections
Shared Roadway markings every 250'
2 Assume 1.61 miles long
3 8 intersections
4 Sharrow: 20 sqft @ $5.00/sqft

Intersections - heading north

Landess - 1N, 1S	2
Butano Dr./Calle Mesa Alta - 1N, 1S	2
Rocky Mountain Ave/Eagle Ridge Way - 1N, 1S	2
Tahoe Dr (west side only) - 1S	1
Westridge Dr (east side only) - 1N	1
Sequoia Dr (east side only) - 1N	1
S Park Victoria - 1N, 1S	2
Heading North: 1 from Landess to Calle Mesa	1
Heading North: 4 from Eagle Ridge to Westridge	4
Heading North: 2 from Westridge to Sequoia	2
Heading North: 8 from Sequoia to SPV	8
Heading South: 17 from SPV to Tahoe	17
Heading South: 1 from Butano Landess	1
	44

Project Number 12

Name	Start	Stop	Length	Improvement Type	Class
Berryessa Creek	Hillview Dr	City Limit	1.86	Path Network	I

Item	Description	Est. Quant.	Units	Unit Price	Total
1	MOBILIZATION (10%)	1	LS	$ 83,277.00	$ 83,277
2	SWPPP (Preparation and Implementation, 5%)	1	LS	$ 41,638.50	$ 41,639
3	PAVEMENT MARKINGS - SHARROWS	1	EA	$ -	$ -
4	BICYCLE DETECTOR SIGNS	1	EA	$ -	$ -
5	ASPHALT CONCRETE (3")	2,579	TON	$ 120.00	$ 309,480
6	STORM MITIGATION (See Note 5)	1	EA	$ 120,000.00	$ 120,000
8	RAMPS UNDER ROADWAYS (See Note 6)	3	EA	$ 75,000.00	$ 225,000
9	AGGREGATE BASE (Class 2, 6")	2,547	CY	$ 70.00	$ 178,290
	Subtotal				$ 957,686
	Contingency (35%)				$ 335,190
	Subtotal				$ 1,292,875
	Design				$ 193,931
	Grand Total				$ 1,486,807

Notes:

1 Class I: 10 feet wide with two 2 foot shoulders
2 Assume 1.86 miles long
3 AC: 14' x 9821' x (3/12)' x 150#/CF / 2000#/ton
4 AB: 14' x 9821' x (6/12)' / 27CF/CY
5 May not be required by Regional Water Quality Control Bd.
6 Assumes cost sharing with SCVWD/Corps future project

Project Number 13

Name	Start	Stop	Length	Improvement Type	Class
Jacklin Rd	I-680 SBR Ramps	Evans Rd	0.37	Arterial Connection	II

Item	Description	Est. Quant.	Units	Unit Price	Total
1	MOBILIZATION (10%)	1	LS	$ 1,257.60	$ 1,258
2	STRIPING	3,908	LF	$ 2.00	$ 7,816
3	PAVEMENT MARKINGS - MILPITAS BIKE LANE SYMBOL	13	EA	$ 70.00	$ 910
4	BICYCLE STENCILS AT SIGNAL INTERSECTIONS	6	EA	$ 100.00	$ 600
5	POST SIGNAGE	13	EA	$ 250.00	$ 3,250
6	ASPHALT CONCRETE	1	TON	$ -	$ -
	Subtotal				$ 13,834
	Contingency (35%)				$ 4,842
	Total				$ 18,675
	Design				$ 2,801
	Grand Total				$ 21,477

Notes:

1 Class II: 5' bike lanes, Bicycle detector symbol at signalized intersections
2 Assume 0.37 miles long
3 3 signalized intersections
4 Milpitas Bike Lane symbol - 14 sqft @ $5/sqft
5 Stencil: 20 sqft @ $5/sqft

Project Number 14

Name	Start	Stop	Length	Improvement Type	Class
S Main St	E Curtis Ave	W Calaveras Blvd	0.85	Route Arterial Connection	III

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	1	LS	$ 945.00	$ 945
2	**DEMOLITION (STRIPING REMOVAL)**	1	LF	$ -	$ -
3	**STRIPING**	1	LF	$ -	$ -
4	**PAVEMENT MARKINGS - SHARROWS**	27	EA	$ 100.00	$ 2,700
5	**BICYCLE DETECTOR SIGNS**	1	EA	$ -	$ -
6	**POST SIGNAGE**	27	EA	$ 250.00	$ 6,750
7	**ASPHALT CONCRETE**	1	TON	$ -	$ -
	Subtotal				$ 10,395
	Contingency (35%)				$ 3,638
	Subtotal				$ 14,033
	Design				$ 2,105
	Grand Total				$ 16,138

Notes:

1 Class III: Shared Roadway bicycle markings after intersections
Shared Roadway markings every 250'
2 Assume 0.85 miles long
3 8 intersections
4 Sharrow: 20 sqft @ $5.00/sqft

Intersections - heading north from Curtis Ave

Curtis Ave - 1N	1
Machado Ave - 1S	1
Alvarez Comm - 1S	1
Sylvia Ave - 1S	1
Corning Ave - 1N, 1S	2
Junipero Ave - 1S	1
Serra Way - 1N, 1S	2
W Calaveras Blvd - 1S	1
Heading North: 7 from Curtis Ave to Corning Ave	8
Heading North: 1 from Corning Ave to Serra Way	2
Heading North: 1 from Serra Way to W Calaveras Blvd	1
Heading South: 1 from W Calaveras Blvd to Serra Way	1
Heading South: 1 from Serra Way to Junipero Dr	1
Heading South: 1 from Junipero Dr to Corning Ave	1
Heading South: 3 from Machado Ave to Curtis Ave	3
	27

Project Number 15

Name	Start	Stop	Length	Improvement Type	Class
Berryessa Creek	Pedestrian Bridge	Milpitas Blvd	0.26	Path Network	I

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	1	LS	$ 11,622.00	$ 11,622
2	**SWPPP (Preparation and Implementation, 5%)**	1	LS	$ 5,811.00	$ 5,811
3	**PAVEMENT MARKINGS - MILPITAS BIKE LANE SYMBOL**	1	EA	$ -	$ -
4	**BICYCLE DETECTOR SIGNS**	1	EA	$ -	$ -
5	**ASPHALT CONCRETE (3")**	403	TON	$ 120.00	$ 48,360
6	**STORM MITIGATION (See Note 5)**	1	EA	$ 40,000.00	$ 40,000
7	**AGGREGATE BASE (Class 2, 6")**	398	CY	$ 70.00	$ 27,860
	Subtotal				$ 133,653
	Contingency (35%)				$ 46,779
	Total				$ 180,432
	Design				$ 27,065
	Grand Total				$ 207,496

Notes:

1 Class I: 10 feet wide with two 2 foot shoulders
2 Assume 0.29 miles long
3 AC: 14' x 1532' x (3/12)' x 150#/CF / 2000#/ton
4 AB: 14' x 1532' x (6/12)' / 27CF/CY
5 May not be required by Regional Water Quality Control Bd.

Project Number 16

Name	Start	Stop	Length	Improvement Type	Class
Dixon Rd	N Milpitas Blvd	Conway St	0.36	Vehicle Lane Reduction	II

Item	Description	Est. Quant.	Units	Unit Price	Total
1	**MOBILIZATION (10%)**	**1**	**LS**	**$ 3,036.25**	**$ 3,036**
	DEMOLITION (STRIPING REMOVAL)	**5,703**	**LF**	**$ 1.50**	**$ 8,555**
2	**STRIPING**	**7,604**	**LF**	**$ 2.00**	**$ 15,208**
3	**PAVEMENT MARKINGS - MILPITAS BIKE LANE SYMBOL**	**20**	**EA**	**$ 70.00**	**$ 1,400**
4	**BICYCLE STENCILS AT SIGNAL INTERSECTIONS**	**2**	**EA**	**$ 100.00**	**$ 200**
5	**POST SIGNAGE**	**20**	**EA**	**$ 250.00**	**$ 5,000**
6	**ASPHALT CONCRETE**	**1**	**TON**	**$ -**	**$ -**
	Subtotal				**$ 33,399**
	Contingency (35%)				**$ 11,690**
	Total				**$ 45,088**
	Design				**$ 6,763**
	Grand Total				**$ 51,852**

Notes:

1 Class II: 5' bike lanes, Bicycle detector symbol at signalized intersections
2 Assume 0.36 miles long
3 1 signalized intersection
4 Removal of two lanes
5 Milpitas Bike Lane symbol - 14 sqft @ $5/sqft
6 Stencil: 20 sqft @ $5/sqft