

City of Mount Shasta

Bicycle Pedestrian and Trails Master Plan 2009



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City of Mt. Shasta



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CHAPTER 1. Introduction

The 2008 Mount Shasta Bicycle, Pedestrian and Trails Master Plan provides for a city-wide network of bicycle paths, lanes, and routes, along with bicycle and pedestrian-related programs and support facilities, intended to ensure cycling and walking becomes an increasingly viable and attractive transportation option for people who live, work and recreate in Mount Shasta. Current bikeway and pedestrian network information was gathered from meetings with the Mount Shasta community, City staff, and the city’s Alternative Transportation Advisory Committee, combined with information on proposed routes from the previously proposed Siskiyou County Bicycle Plan, Mount Shasta General Plan and the Mount Shasta Community Action Plan.

The purpose of this Bicycle, Pedestrian and Trails Master Plan is to improve bicycle and pedestrian transportation in Mount Shasta, in part by meeting the requirements of the California Bicycle-Transportation Act, the requirements for which are contained in Sections 890-894 of the California Streets and Highways Code.

1.1. DEFINITION OF PEDESTRIAN AND BICYCLE IMPROVEMENTS

Bicycle and pedestrian improvements fall into two categories: physical improvements (engineering) and programmatic (education, encouragement and enforcement) improvements. Specific definitions of physical improvements follow in this section, while education, encouragement and enforcement will be defined later, in Chapter 7. These principles, often referred to as the “5 ‘E’s” can serve as a useful organizational tool. These “5 ‘E’s” represent a comprehensive approach to developing, maintaining and organization all aspects of a bikeway and pedestrian system and also serve as a commonly referenced organizational structure for Safe Routes to School Programs. More information on the “5 E’s” and safe routes to school is located in the Plan Appendix.

A “5th E” – evaluation - is a good way to periodically review and measure improvements in the walking and bicycling environment and can be useful in determining whether more people are walking and biking.



The City of Mount Shasta’s dominant, eponymous landmark.

1.2. SETTING

Situated in Siskiyou County, at the foot of Mount Shasta in far northern California, the city of Mount Shasta, shown in Map 1, boasts a rural atmosphere with captivating mountain views. The city is located at an elevation of 3500 feet in the Strawberry Valley, and is

nearly encircled by the lands of the Shasta-Trinity National Forest. According to American Fact Finder, in 2006 the city housed approximately 3,600 residents within its 3.4 square miles. Mount Shasta abuts California Interstate 5 (I-5), and an active Union Pacific railroad line.

The city contains two elementary and middle schools, Mount Shasta Elementary School (K-3) and Sisson School (4-8), which are part of the Mount Shasta Union Elementary School District. There are two Siskiyou Union High School District schools in Mount Shasta, Mount Shasta High School (9-12) and Jefferson (continuation) High School.

Map 1 depicts generalized land use and General Plan Designations within Mount Shasta. Much of the land within the city limits is zoned for general residential (predominately single family), public land, parks and commercial centers. Mount Shasta's downtown is pedestrian-scale with existing sidewalks, crosswalks and bicycle access via shared-use streets.

Mount Shasta is recognized as a major gateway to regional recreation opportunities, including fishing, hiking, backpacking, skiing, mountain climbing, horseback riding, mountain biking and cycling. A major driver of the bicycle and pedestrian planning effort is a desire to increase linkages between the city and existing recreational facilities. Key existing and potential future connections include the north/south running Pacific Crest Trail (PCT), existing mountain biking trails accessed off of Everitt Memorial Highway and other proposed shared-use trails throughout the region.

1.3. WHY DOES MOUNT SHASTA NEED A BICYCLE, PEDESTRIAN AND TRAILS MASTER PLAN

The City of Mount Shasta recognizes that bicycling and walking enhance the quality of life for residents, commuters, and visitors to the City. This Plan is for all residents who desire to bicycle or walk to work, improve their level of daily physical activity, go for a family bicycle ride to the park, library, or down to the hatchery, or experience a recreational destination such as Lake Siskiyou.

Developing a quality system of bikeways and walkways that will complement the motor vehicle system in Mount Shasta requires long-term planning, a comprehensive vision, and integration with other transportation, land use and economic development plans. The creation and implementation of the Plan represents a critical step in the long-term success of making Mount Shasta a safe and inviting city for bicyclists and pedestrians of all ages and abilities.

1.4. MAJOR RECOMMENDATIONS

Key recommendations of the Mount Shasta Bicycle, Pedestrian and Trails Master Plan include the following items. Later chapters of the Plan discuss these recommendations in greater detail.

1. Create a network of Class I, II and III bicycle facilities in the city of Mount Shasta to enhance safety and enjoyment, and encourage bicycling for both residents and visitors.
2. Create a connected shared-use path (Class I) system that will allow pedestrians and bicyclists easily access all parts of the city.

3. Create a continuous north-south travel corridor for cyclists and pedestrians that avoids busy streets to the greatest extent possible. The proposed route begins on Sheldon Avenue and runs north, through Sisson Meadows to Shasta Avenue.
4. Prioritize pedestrian and bicycle improvements in high need areas – priority pedestrian corridors, downtown, near schools and major employers.
5. Update policies on bicycling and walking based on recommendations contained in this Plan.
6. Seek Bicycle Transportation Account (BTA) program approval in order to meet eligibility requirements for state funding and ensure that this Plan is updated every 5 years in order to retain eligibility.
7. Implement suggested updates to the city’s standard design guidelines. These should include Class I, II and III bicycle facilities, bicycle parking and bicycle loop detectors. Pedestrian facilities design standards should include truncated domes with curb ramps.
8. Develop and update policies and Municipal Code language on back-in diagonal parking, snow removal on bicycle and pedestrian facilities and sidewalk bicycle riding.
9. Form a permanent bicycle and pedestrian advisory committee.
10. Revise General Plan to reference this Plan regarding alternative transportation issues.

1.5. ROLE OF THE BICYCLE, PEDESTRIAN AND TRAILS MASTER PLAN

The Bicycle, Pedestrian and Trails Master Plan provides a broad vision and specific strategies and actions for the improvement of bicycling and walking in Mount Shasta. The plan is intended to be used as a guide for developing a citywide system of bike lanes, bike routes, multi-use trails, and bicycle parking in addition to a system of sidewalks, and crossing improvements that will facilitate safe and efficient travel within Mount Shasta.

1.6. BICYCLE, PEDESTRIAN AND TRAILS MASTER PLAN PROCESS

This Plan was developed using many resources, including input from citizens of Mount Shasta, members of the Alternative Transportation Advisory Committee (ATAC), City staff, field research and information outlined in city plans and documents. The Plan was written as a series of three working papers and submitted to the ATAC for comment prior to release of the entire draft document for public comment.

In a dramatic expression of community support for this Plan, ninety percent of the funding was provided through community donations. Funding was provided by the Mountain Wheelers, the Mountain Runners, the Mount Shasta Trail Association, Pedali, Timberworks, the Mount Shasta Yoga Center and the City of Mount Shasta.

In 2007, the City of Mount Shasta created the ATAC to help guide non-motorized transportation planning for the Circulation Element of the General Plan update. The body has worked over the last year to lay the groundwork for a non-motorized transportation plan by conducting community outreach in the form of a detailed bicycle and pedestrian survey. A community forum and kick-off meeting to the non-motorized transportation planning process was held on April 9, 2008 at the Stage Door coffee house. Notification of the meeting was provided to newspapers two weeks in advance of the event, which was open to the public. The draft plan was made available to the public for comment on November 3, 2008 with the comment period open for three weeks, including a joint City Council/Planning Commission meeting held on November 17, 2008. At the end of this period comments were incorporated, prior to the Plan's presentation to City Council for approval.

1.7. OVERVIEW OF THE PLAN

The Bicycle, Pedestrian and Trails Master Plan is organized as follows:

- **Chapter 1, Introduction** provides an overview of this Plan, and its purpose.
- **Chapter 2, Goals, Objectives and Policy Actions** reviews relevant local, state and federal planning documents and establishes new Goals, Policies and Action Items to guide bicycle planning in the City of Mount Shasta.
- **Chapter 3, Existing Conditions** provides a description of existing bicycle conditions in Mount Shasta. The chapter includes maps depicting existing bikeways, and pedestrian facilities and descriptions of existing bicycle and pedestrian programs.
- **Chapter 4, Needs Analysis** documents the need for bicycle transportation in Mount Shasta including a commuter bicycle needs analysis, general bicycle needs analysis, pedestrian needs analysis, crash analysis, summary of identified needs and summary of estimated future usage and benefits analysis.
- **Chapter 5, Proposed System Improvements** depicts the recommended system of on- and off street bikeways, and the pedestrian and trail system. This section also discusses how to create a bikeway system, a long-term vision, descriptions of short- and mid-term bicycle projects, pedestrian projects and supporting education and enforcement programs.
- **Chapter 6, Design Guidelines** provides design guidelines to be referenced when implementing bikeway and pedestrian projects in Mount Shasta. Design guidelines are gathered from local, state and national best practices. The chapter is intended to serve as a guide for regional and local planners, engineers and designers when designing and constructing bicycle facilities in Mount Shasta.
- **Chapter 7, Implementation Strategy** provides information on an implementation plan, cost breakdowns, maintenance, security and funding.

CHAPTER 2. Goals, Policies and Actions Items

2.1. STUDY AREA

The general study area for this Plan is the Mount Shasta city boundary, with consideration given to the city's sphere of influence as well. Relevant legislation, plans and policies exist at the local, county, state and federal level. The remainder of this chapter discusses this information in greater detail.

2.2. RELATIONSHIP TO OTHER PLANS

The creation of the Bicycle, Pedestrian and Trails Master Plan is supported by the *2007 City of Mount Shasta General Plan Circulation Element (General Plan)* and the *2002 Mount Shasta Community Action Plan (Community Action Plan)*. This Plan will take the conceptual ideas laid forth in each of these plans and integrate them into a cohesive and detailed plan that the city can use to prioritize improvements, target strategic funding sources and efficiently implement desired policies and programs.

2.3. LOCAL BIKEWAYS, PEDESTRIAN FACILITIES AND PLANS

While Mount Shasta currently has few dedicated bicycle facilities, recreational bicycling – both on-street and mountain biking – has been popular for years in the area. Similarly, pedestrian facilities are concentrated in the downtown area and are generally limited to sidewalks and striped crosswalks at signalized intersections. However, the compact central portion of the city is attractive to walkers. Recent efforts to improve conditions for bicycling in the city of Mount Shasta included provision for Class II bike lanes in the 1994 and 2007 General Plan updates, recommendations in the Community Action Plan, and the 2000 Draft Siskiyou County Bicycle Transportation Plan. More details on these efforts are included in the Regional and Local Policies section of this report.

Subsequent to adoption of the 1994 General Plan, Class II bike lanes were striped and a bicyclist stencil was placed in the lanes on a small number of streets. The lanes and stencils were never repainted.

In 2007, the City Council appointed an Alternative Transportation Advisory Committee (ATAC) to address the needs of bicyclists and pedestrians in the city, and directed the committee to create a bicycle and trails master plan for the city. As a preliminary step in the process, the ATAC conducted a bicycle and walking survey of residents. The survey is discussed in detail in the Needs Analysis portion of this report.

2.4. RELEVANT LEGISLATION AND POLICIES

The following section provides context for this Plan in terms of past and current policy and regulatory efforts related to bicycling and walking.

2.4.1. *Federal Legislation and Policies*

SAFETEA-LU (2005)

The Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users guarantees over \$244 billion in federal funding for highways, highway safety, and public transportation. This bill follows the trend of previous federal transportation bills (TEA-21 and ISTEA) toward integration of bicycling with mainstream transportation policy.¹

2.4.2. *State Legislation and Policies*

Deputy Directive Number DD-22: Context Sensitive Solutions

This Caltrans directive, approved in 2001, reads, “The Department uses Context Sensitive Solutions as an approach to plan, design, construct, maintain, and operate its transportation system. These solutions use innovative and inclusive approaches that integrate and balance community, aesthetic, historic and environmental values with transportation safety, maintenance, and performance goals. Context sensitive solutions are reached through a collaborative, interdisciplinary approach involving all stakeholders.”

Deputy Directive Number DD-64-R1: Accommodating Non-Motorized Travel

Caltrans Deputy Directive 64 (DD-64) also applies to projects within Caltrans jurisdiction or funded by Caltrans moneys and seeks to address the needs of all users through the development of “complete streets”. The document states: “The department views all transportation improvements as opportunities to improve safety, access and mobility for all the travellers in California... The Department develops integrated multimodal projects in balance with community goals, plans and values. Addressing the safety and mobility needs of bicyclists, pedestrians and transit users in all projects, regardless of funding is implicit in these objectives”

Assembly Bill 1358, The Complete Streets Act

The Complete Streets Act requires a jurisdiction to modify the Circulation Element of their General Plan when updated to identify how the jurisdiction will provide for the routine accommodation of all roadway users including motorists, pedestrians, cyclists, individuals with disabilities, seniors and public transportation. This act is intended to encourage healthy physical activity, reduce greenhouse gas emissions, reduce the need to make short trips by motor vehicle, and cut planning costs.

The bill also directs the Office of Planning and Research to amend guidelines for the development of general plan circulation elements so that the building and operation of local transportation

¹ For more information refer to www.fhwa.dot.gov/safetealu.

facilities safely and conveniently accommodates everyone, regardless of their mode of travel. The Act will take effect on January 1, 2009.

California Blueprint for Bicycling and Walking

This document describes implementation goals designed to increase bicycling and walking, while improving safety, as well as funding sources for bicycle and pedestrian projects.

California Highway Design Manual

In order to obtain federal and state funding for bicycle projects, applicants must adhere to the California Highway Design Manual design standards.² Relevant chapters include:

- Chapter 80, Application of Standards
- Chapter 20, Geometric Design and Structure Standards
- Chapter 1000, Bikeway Planning and Design

Bicycle Transportation Act Compliance checklist

In order to meet the California Bicycle Transportation Act requirements, the 2008 Mount Shasta Bicycle and Pedestrian Master Plan must include the provisions listed in Table 2-1.

Table 2-1. Mount Shasta 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 4.2, Section 4.3
(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.	Map 1, Section 1.2, Map 2, Section 3.1.1
(c)	A map and description of existing and proposed bikeways.	Map 2, Section 3.2.1, Map 3, Section 5.3
(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.	Map 2, Section 3.2.3, Map 3 Section 5.3
(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.	Map 2, Section 3.2.5, Map 3, Section 3.2, Section 5.3
(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.	Map 2, Section 3.2., Map 3, Section 5.3

² Document available at - <http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm>.

BTA	Required Plan Elements	Location Within the Plan
891.2		
(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.	Section 3.2.4
(h)	A description of the extent of citizen and community involvement in development of the plan.	Section 1.6, Section 2.3, Section 2.4.3, Section 4.5
(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.	Section 2.2, Section 2.3, Section 2.4.3
(j)	A description of the projects proposed in the plan and a listing of their priorities for implementation.	Section 5.3, Section 7.1
(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.	Section 3.2, Section 7.0 Section 7.2

2.4.3. Regional and Local Policies

Several related planning processes have helped guide the vision and development of the Mount Shasta Bicycle, Pedestrian and Trails Master Plan. The recommendations from these documents have been incorporated into this Plan to maintain consistency between past and future planning efforts.

Below are summaries of the plans and their relevant goals, objectives and policies.

City of Mount Shasta General Plan (2007)

The *City of Mount Shasta General Plan* is a long-term, comprehensive plan that was updated in 2007 in accordance with California Government Code, Section 65300. The objective of the Circulation Element of the Plan “is to provide long-term policies concerning the movement of people, goods, and services within the Mount Shasta planning area.”

One of the general plan objectives is to promote safe and efficient pedestrian and bicycle transportation and other forms of non-motorized transportation. The policy is to, “Promote the development of bikeways, sidewalks, pedestrian pathways and multi-use paths that connect residential neighborhoods with other neighborhoods, schools, employment centers, commercial centers and public open space, and that separate bicyclists, skateboarders and pedestrians from vehicular traffic whenever possible. Ensure that pedestrian facilities follow logical routes designed to serve pedestrian needs and are not constructed as ‘sidewalks to nowhere’...” The relevant implementation measures from this sub-section that refer to pedestrian or bicycle facilities include:

...Amend the development code to require that new sidewalks, pedestrian pathways, multi-use paths and/or bikeways be constructed for new development based upon current and foreseeable future needs in the area of proposed projects...

... When siting sidewalks, pedestrian pathways, bikeways and/or multi-use paths, the City shall examine where existing facilities are located and determine if there are other more logical travel patterns that should also be served...

... The City should create an Alternative Transportation Advisory Committee (ATAC) to serve as an advisory body on matters relating to planning of the City's bikeway, sidewalk, pedestrian pathway and multi-use path system, as well as future modifications and expansion of that system...

... Develop a Walkways, Trails and Bikeways Master Plan that incorporates the recommendations of the Community Action Plan, the draft Siskiyou County Bicycle Plan, and other planning proposals, where appropriate, to plan the location and development of future trails and alternative transportation routes in the City and the vicinity...

... When the City prepares a master plan and, prior to completion of such a plan as the City considers issues related to walkway, trail and bikeway issues, the City will consider the following needs and general objectives:

A. The city bicycle network will connect with the countywide bicycle network. The city will encourage and work with the county in development of a countywide bicycle network.

B. Signage should be provided (where automobile traffic merges with or intersects bicycle traffic) to notify automobiles of the presence of cyclists.

C. Repair or development of railroad crossings should be done in a way that allows safe crossing by bicycles.

D. The timing of traffic lights and sensitivity of traffic sensing equipment should accommodate bicycles.

... The City, local schools and concerned community organizations will seek funding opportunities through the Safe Routes to School program to facilitate the planning, design, and implementation of eligible projects to improve the safety and accessibility of pedestrian and bicycle routes to local schools...

The General Plan further states that if the railroad line between the City of Mount Shasta and McCloud is ever proposed for abandonment, the City will support the conversion of the route for a public multi-use path.

The Circulation Element of the General Plan presents a conceptual plan for primary bikeways, shown in Map 3, that is consistent with the proposed Siskiyou County Bicycle Transportation Plan and the Conceptual Trail Map (Map 4) presented in the Community Action Plan. Both plans are discussed in detail below.

Siskiyou County Bicycle Transportation Plan (Proposed)

The Purpose and Goals stated in the Draft Siskiyou County Bicycle Transportation Plan³ are to “provide an ongoing mechanism for planning and implementing bicycling-related transportation

³ *An administrative draft of a Siskiyou County Bicycle Transportation Plan was prepared in 2000 for the Siskiyou County Planning Department by Tom Hesselden and Associates. While the plan was never adopted, it nevertheless provides some recommendations for bicycle-related transportation improvements in the planning area.*

improvements in Siskiyou County in order to satisfy existing needs and keep pace with anticipated growth.” The specific goals are to:

1. Develop and promote bicycle commuting in order to reduce traffic congestion, conserve energy, and improve air quality.
2. Develop and promote recreational bicycling opportunities in order to enhance and diversify the local economy and provide close-to-home recreational and exercise opportunities.
3. Improve safety for bicyclists
4. Provide adequate bicycling support facilities
5. Ensure effective bicycle transportation planning and design.
6. Identify and implement effective funding strategies for installing and maintaining bicycling-related facilities.

The Draft Plan specifies the following ranking criteria for the prioritization of proposed bicycle routes:

- Aids commuting; provides linkages
- Improves safety
- Offers recreational, exercise, and/or tourism benefits
- Accommodates a mix of users, including handicapped
- Will serve a large number of people
- Includes support facilities (parking, restrooms, etc.)
- Has high demand and broad support
- Public access already secured (percent of route)

The Draft Siskiyou County Bicycle Transportation Plan contains detailed policies to implement the above goals as well as tables outlining prioritized bike amenities.

Specific policies designed to implement these goals include recommendations to:

.... Promote bicycle routes that connect residential neighborhoods with other neighborhoods, major employment centers, schools, libraries, shopping areas, commercial centers, parks, museums, government offices, post offices, and other destinations within and between communities...

...support the development of continuous interconnected bicycle routes by identifying gaps and giving high priority to installation of bicycle routes to complete connectivity...

Goal V of the Bicycle Plan proposed to, “Ensure effective bicycle transportation planning and design”, and was supported by policies to, “Consider bicycle facility needs in the planning, design, construction, reconstruction, and maintenance of all transportation systems, with highest priority given to designated bicycle routes.”

Figure 16 of the Draft Bicycle Plan addressed proposed designated bikeways in the Mount Shasta City area, and Table 14 consisted of a list of proposed bikeways with recommended improvements. The Draft Bicycle Plan acknowledged the need to plan

bicycle facilities in a manner that minimizes conflicts between users and private landowners, and contained an objective with policies concerning legal access for bicycle routes.

Figure 4-3, *Conceptual Primary Bike Routes*, is included in this General Plan to indicate the public streets and roads that also serve as primary bike routes in the planning area. These routes connect with schools and parks, and also provide connections to regional destinations as part of a larger network (e.g., Lake Siskiyou, Bunny Flat, Weed, Dunsmuir and McCloud). The indicated routes are not intended to be exclusive. Other routes are understood to also be commonly used by bicyclists.

This figure also does not attempt to distinguish between streets and roads that have been or that could be improved to provide “Class II” type bike lanes beside the motor vehicle roadway, or “Class III” routes where the roadway is shared by motor vehicles and bicyclists.

In addition to the primary bike routes indicated in Figure 4-3, there have been several proposals in the community for multi-purpose trails of the “Class I” variety, as suggested in Figure 4-2. One such conceptual route would connect the downtown area of the City with the City Park via a route west of the railroad tracks. Another conceptual route would extend west from South Mount Shasta Boulevard through the “Roseburg Site” and underneath Interstate 5 to connect to South Old Stage Road.

More detailed study is needed to identify opportunities for specific improvements and proposed alignments for Class I trails, as well as Class II bike routes. The General Plan supports preparation of a master plan that provides more detailed plans for the location and development of walkways, trails and bikeways. It is expected that such a master plan will provide much more detail than, and which may vary from, the conceptual routes indicated in Figure 4-2 or Figure 4-3. Since the routes indicated in these figures are only conceptual, the development of more detailed routes” with these figures.⁴

Mount Shasta Community Action Plan

Adopted by the Mt. Shasta City Council in 1996 and again in May, 2002, the *Mount Shasta Community Action Plan’s* stated mission is to, “maintain the character and resources of our ‘small town’ community while striking an appropriate balance between economic development and preservation of our quality of life.”

As envisioned in the Action Plan, by the year 2020 residents and visitors in Mount Shasta should be able to safely and comfortably walk and bike to local shops, schools, social events, and nearby recreational areas on well-maintained sidewalks and pleasant, well-planned trails. A second vision stated in the *Community Action Plan* is, “comprehensive planning for development of pedestrian and bicycle trails, to be incorporated into the City’s General Plan Circulation Element and the regional transportation plan.”

Table 2.2 summarizes strategies that can help make Mount Shasta’s vision a reality and identifies entities that can help implement these strategies successfully.

Table 2.2. Comprehensive Bicycle and Pedestrian Planning Action Strategies

Action Strategy	Responsible Party
Develop a comprehensive trail and community enhancement project that considers including: preservation of Sisson Meadows, as open space; a Castle Creek waterway enhancement project with relocated parking; a trail from downtown to Horse Camp; trail	City, Mount Shasta Trail Association, Siskiyou Land Trust, various community

⁴ Italicized text in this section represents a summary of the Siskiyou County Proposed Bike Plan extracted from the 2007 Mount Shasta General Plan.

Action Strategy	Responsible Party
connections to the Mt. Shasta Fish Hatchery, the Roseburg Property and Lake Siskiyou; and a trail from downtown to City Park. Incorporate the plans into the City General Plan Circulation Element and the Regional Transportation Plan.	organizations, and the regional transportation planning agency
Evaluate opportunities and plan the improvement of transportation connections where feasible for vehicles, pedestrians and bicycles between South Mount Shasta and downtown.	City, County, Local Transportation Planning Agencies

A subsection of the Action Plan recommends the development of a “downtown district plan,” which would encourage pedestrian and bicycle use within town and to surrounding visitor accommodations, recreation sites and other attractions.

Another section considers recreational resources, and states that, “support for community multi-use trails in the area has been one of the most popular issues supported by the action plan community meetings.” The most popular recreational proposal at community meetings was a comprehensive trail and community enhancement project that would include a trail from downtown to Horse Camp, a trail connecting the Roseburg Property to the Fish Hatchery and Lake Siskiyou, and a trail to the City Park. The objectives related to recreation that address bicycle amenities include: “adopt a comprehensive community pedestrian and bicycle trail plan and support development of the trail system and improve transportation to recreational resources and related roads and trails.” The Plan also specifically recommends supporting the planning and development of recreation trails on portions of the Roseburg Mill Site and developing and circulating promotional material for regional recreation resources in South Siskiyou County.

Title-18 (Mount Shasta Zoning Code)

The City’s zoning code contains specific requirements designed to promote pedestrian and bicycle travel in the following sub-sections:

- General Requirements: *Outdoor merchandise displays must be maintained in good repair, and no item may be hazardous to pedestrian or vehicular traffic, or extend into the safe line-of-sight distances at intersections, as determined by the City Engineer.*
- Size restrictions for large scale commercial, industrial and multi-family residential facilities: *The purpose of this section is:*
 - ...to promote and facilitate a safe and comfortable pedestrian scale environment...*
 - ...to encourage development that produces a desirable relationship between buildings and the pedestrian and vehicular circulation systems and between such development and adjacent land uses...*
 - ...to establish specific standards for coordination of landscaping and street trees along public rights-of-way, public pedestrian ways and buffers between dissimilar uses...*
- Glare: *Reflected glare onto nearby buildings, streets or pedestrian areas is prohibited.*
- Pedestrian circulation and amenities:
 - ...A safe pedestrian circulation system shall be provided **on site** which connects to public streets and neighborhoods, where possible...*

...Pedestrian walkways **within the development** shall be differentiated from driving surfaces through a change in materials...

- Parking and vehicular circulation: *Large scale development should recognize parking facilities as transitional spaces where users change modes of travel, from car, bus, or bicycle to pedestrian. The design of those spaces shall therefore safely and attractively serve all modes, especially the pedestrian.*

2.5. GOALS, POLICIES AND ACTION ITEMS

GOALS, POLICIES AND ACTION ITEMS

In order to establish Mt. Shasta as a community with a healthy and environmentally-friendly quality of life, and to provide planning guidance and ensure compliance with other regional planning efforts, the following goals, policies and action items for the Mt. Shasta Bicycle, Pedestrian and Trails Master Plan have been prepared. This process has considered goals and policies from the draft Siskiyou County Bicycle Transportation Plan, recommendations from the public and local bicycle and pedestrian advocates, and professional experience and judgment. These suggested goals, policies, and action items are consistent with the General Plan and the Community Action.

This section is divided into four parts:

1. A list of goals and proposed policies.
2. A discussion of recommended policy changes. These proposed changes pertain to existing policies or established practices. The topics addressed include diagonal on-street parking, snow removal and sidewalk riding.
3. An implementation recommendation to establish a permanent pedestrian and bicycle advisory committee.
4. A list of action items and corresponding physical projects. These action items enact the goals and policies established by this plan. For example, Action Item 4 addresses the creation of linkages to recreational facilities from the downtown area. This fulfills goals and policies that relate to increasing connectivity and improving conditions for recreational riding. Example projects relating to this action item include the City Park to Downtown Pathway and the Rotary Trail. Project linkage information is included in Table 2.3. It should be noted that not all goals and policies (e.g., those that relate to maintenance and design standards) are linked to specific projects.

2.5.1. GOALS AND POLICIES

Goal I. Develop and promote good walking conditions to encourage pedestrianism in order to improve public health, reduce traffic congestion, conserve energy and improve air quality.

Policy 1. Promote the development of sidewalks, pedestrian pathways and shared-use (Class I) paths that connect residential neighborhoods with other neighborhoods, major employment centers, schools, libraries, shopping areas, commercial centers, parks, museums, government offices, post offices, and other destinations within and between communities. Ensure this system is designed to meet the needs of as many user groups as possible.

Policy 2. Amend development code to require that new sidewalks, pedestrian pathways and shared-use (Class I) paths be constructed for new development based upon current and foreseeable future needs in the areas of proposed projects.

Policy 3. Ensure that public sidewalks provide connections between transit stops, pedestrian and bicycle routes, and the network of public and private trail systems.

Policy 4. Work with partner agencies and citizen groups to develop and implement education and encouragement programs related to walking.

Policy 5. Develop a sidewalk snow-clearing plan that would promote safe pedestrian access to schools and downtown commercial areas along primary transportation routes during the winter months.

Policy 6. Improve crossing conditions at intersections identified by this Plan and at other intersections as conditions change or additional needs are identified.

Goal II. Develop and promote bicycle use for commuting and other utilitarian trips to reduce traffic congestion, conserve energy and improve air quality.

Policy 1. Promote the development of bicycle routes that connect residential neighborhoods with other neighborhoods, major employment centers, schools, libraries, shopping areas, commercial centers, parks, museums, government offices, post offices, and other destinations within and between communities. Ensure this system is designed to meet the needs of as many user groups as possible.

Policy 2. Support the development of continuous, interconnected bicycle routes by identifying gaps and giving high priority to development of facilities that increase connectivity.

Policy 3. Where feasible and acceptable to affected landowners, retrofit existing cul-de-sacs, to provide enhanced bicycle and pedestrian linkages between neighborhoods. Require new developments with cul-de-sacs to include such linkages.

Policy 4. Encourage the installation of bicycle parking facilities at transit stops, parks, commercial destinations, government buildings and other destinations. Develop and enact minimum standards for bicycle parking.

Policy 5. As part of the review process for proposed residential subdivisions, require bikeway and pedestrian connections to the existing and planned community bikeway system..

Policy 6. Promote and maintain a (Class III) network of lightly traveled streets designated by signage that provide access to schools, commercial centers and parks for bicyclists of all ages and experience levels.

Policy 7. Work with partner agencies and groups to develop and implement education and encouragement programs for bicyclists.

Policy 8. Encourage the placement of bicycle racks and other mechanisms for year-round transportation of bicycles on public transit.

Goal III. Develop and promote recreational bicycling opportunities to enhance and diversify the local economy, and provide close-to-home recreational and exercise opportunities.

Policy 1. Participate with federal and state land management agencies in the development and maintenance of bicycling opportunities on lands under their jurisdiction.

Policy 2. Design bikeways to take full advantage of scenic and open space opportunities.

Policy 3. Encourage the establishment or expansion (where appropriate), and maintenance of regional single-track mountain bicycling trail networks.

Policy 4. Support the establishment of neighborhood BMX and single-track mountain bicycling trails to enhance children’s recreational opportunities.

Policy 5. Provide bicycling facilities for all age and skill levels.

Policy 6. Establish and showcase Class I bikeways/shared use paths, taking advantage of striking views, open space areas, water features, historic sites, and other opportunities, to serve as a tourism attraction in addition to facilitating local bicycle transportation needs.

Policy 7. Coordinate bicycle routes with the County, Scenic Byways, the Discovery Trail, and other tourism-oriented route identifications.

Goal IV. Improve safety for pedestrians and bicyclists.

Policy 1. Adopt design standards that create safe and convenient facilities to encourage walking and bicycling. Design bicycle facilities to minimize conflicts between bicyclists, pedestrians and other types of users. Provide separated routes if necessary.

Policy 2. Assign high priority to projects that are designed to minimize identified cyclist/motorist conflicts, especially in the vicinity of schools.

Policy 3. Coordinate with schools to develop an active “Safe Routes to School Program” that identifies the safest and most direct walking and bicycling routes to school.

Policy 4. Identify and, where possible, eliminate barriers along existing routes used by bicyclists, with special attention to bridges, freeways, unpaved road shoulders, and railroad tracks.

Policy 5. Improve intersections between bikeways and roads, streets and railroads, and provide grade-separation at high-conflict intersections wherever feasible. Provide for safe bicycle crossings during repair or development of railroad lines.

Policy 6. Require bicycle-safe drainage grates for all drainage structures located where bicycle use is anticipated.

Policy 7. Enhance provisions for safety and comfort of cyclists on arterial and collector streets.

Policy 8. Provide bicycle (where applicable) and pedestrian facilities on both sides of all streets.

Policy 9. At intersections with actuated signals, adjust detection and timing and provide standard markings to accommodate bicyclists.

Policy 10. Implement traffic calming measures where appropriate.

Policy 11. When designing Class II bikeways along streets with adjacent on-street parking, use back-in diagonal or parallel parking rather than head-in diagonal parking.

Policy 12. Avoid designing Class I bikeways parallel to and alongside roads, particularly those having numerous driveways, intersections and other vehicular crossing points.

Policy 13. At locations where automobile traffic merges with or intersects bicycle traffic, provide signage to notify motorists of the presence of cyclists.

Policy 14. Provide literature and up-to-date bicycle route and walking maps for public use in paper and online formats.

Goal V. Employ “best practices” for pedestrian and bicycle transportation planning and design.

Policy #1. Where feasible and acceptable to affected landowners, retrofit existing cul-de-sacs, to provide enhanced bicycle and pedestrian linkages between neighborhoods. Require new developments with cul-de-sacs to include such linkages.

Policy #2. Design bicycle routing in a manner that takes advantage of available scenic, open space, recreational, aesthetic, historical, interpretive, and other opportunities.

Policy #3. Require that new bicycle facilities be designed to meet or exceed current Caltrans bikeway design guidelines (Caltrans Highway Design Manual, Chapter 1000 and CAMUTCD Chapter 9), other standards adopted by Caltrans and as required by Sections 2374-2376 of the California Streets and Highways Code.

Policy #4. Change head-in diagonal parking to back-in parking.

Policy #5. As part of the review process for proposed residential subdivisions, require bikeway and pedestrian connections to the existing and planned community bikeway system.

Policy #6. Consider pedestrian and bicycle facility needs in the planning, design, construction, reconstruction, and maintenance of all transportation systems, with highest priority given to designated walking or bicycling routes.

Policy #7. Encourage construction of recommended bicycle facilities in conjunction with all road, street, and bridge improvement projects that coincide with Mount Shasta Bicycle, Pedestrian and Trails Master Plan corridors.

Policy #8. Retrofit existing roadways with paved shoulders for use as Class II, Class III or undesignated bikeways.

Policy #9. Connect the city bicycle network with the countywide network. Work with and encourage the county in the development of a countywide bicycle network.

Policy #10. Construct or plan construction of Class I bikeways in undeveloped areas prior to or concurrent with the development of these areas.

Policy #11. Update the bicycle plan every five years or as otherwise necessary to meet state funding requirements to ensure that the plan remains current and viable.

Policy #12. Prohibit the removal of bicycle lanes for accommodation of additional automobile lanes without a thorough traffic study analyzing the alternatives and unless the bicycle accommodation is replaced by another facility of equal or greater utility to cyclists.

Goal VI - Ensure Legal Access to Bicycle Routes

Policy #1. Obtain public easements for bicycle routes along designated corridors at the time of land subdivision or entitlement.

Policy #2. Retain bicycle/pedestrian access points and trails across public lands and rights-of-way if these lands or rights-of-way are otherwise slated for disposal.

Policy #3. In conformance with California Streets and Highways Code, Section 892, consider potential bicycle facility opportunities prior to vacating un-used city rights-of-way.

Goal VII - Ensure equitable access to public facilities for people of all ages and abilities.

Policy #1. Implement the accessible transportation requirements established by the Americans with Disabilities Act of 1990 (ADA) and the California Building Code (Title 24) as they pertain to bicycle routes, *pedestrian facilities*, and shared-use paths.

Policy #2. Consider an ordinance requiring clearing of snow from sidewalks to prevent pedestrians from having to use the streets during the winter.

Policy #3. Provide for equal access to and along public sidewalks and along as much of the trail system as feasible. Develop a plan to clear snow from high priority sidewalks first (e.g., along streets providing access to schools). Investigate funding opportunities to enlarge the city's maintenance budget to allow for increased sidewalk snow clearing and other general maintenance activities.

Goal VIII. Identify and implement effective funding strategies for installing and maintaining pedestrian- and bicycle-related facilities.

Policy #1. Provide seed money to cover preliminary design and initial grant writing costs whenever possible, knowing that this type of expenditure will ensure better quality and more timely projects and will make it easier to obtain outside funding down the road.

Policy #2. In instances where easements or other provisions for pedestrian or bicycle facilities is required as part of the development approval process, developers may also be required to fund pre-construction and/or construction costs associated with these facilities.

Policy #3. For public works projects involving roads, bridges, etc., to be funded by outside sources and in which the inclusion of pedestrian and/or bicycle facilities would be desirable, seek coverage of the costs of the pedestrian and/or bicycle facilities from the same funding sources.

Policy #4. Require developers to include pedestrian and bicycle transportation facilities in new, large residential and commercial developments, with such facilities to either be offered for public dedication upon completion, or to be held and maintained by an applicable homeowners association or other private property management entity.

Policy #5. Develop ongoing contacts with regional, state and federal agencies, and private entities to identify available funding sources.

2.5.2. *Recommended Policy Changes*

Proposed changes to Municipal code chapter 10

This plan recommends several changes to Chapter 10 of the Mount Shasta Municipal Code. These changes include a clarification of the term sidewalk, as well as updates to language regarding bicycle use on roadways and sidewalk riding.

Section 10.04.050 defines a sidewalk as “that portion of a street between the curb lines and the adjacent property lines.” A clarification of this language would read “that paved portion of the street between curb lines or the street’s edge and the adjacent property lines. This area is intended for travel by means other than a motor vehicle.”

Section 10.20.090 defines the allowed use of the roadway by cyclists, requiring the cyclist to “ride as nearly as practicable within five feet of the right-hand curb or edge of the roadway except when passing a standing or other vehicle or making a left hand turn at an intersection.” This is inconsistent with the current California Motor Vehicle Code Division 11, Chapter 1, Article 4, which defines the following rules and exceptions for bicycle travel on the roadway.

California Motor Vehicle Code Division 11, Chapter 1, Article 4 - Operation on Roadway

21202. (a) Any person operating a bicycle upon a roadway at a speed less than the normal speed of traffic moving in the same direction at that time shall ride as close as practicable to the right-hand curb or edge of the roadway except under any of the following situations:

(1) When overtaking and passing another bicycle or vehicle proceeding in the same direction.

(2) When preparing for a left turn at an intersection or into a private road or driveway.

(3) When reasonably necessary to avoid conditions (including, but not limited to, fixed or moving objects, vehicles, bicycles, pedestrians, animals, surface hazards, or substandard width lanes) that make it unsafe to continue along the right-hand curb or edge, subject to the provisions of Section 21656. For purposes of this section, a “substandard width lane” is a lane that is too narrow for a bicycle and a vehicle to travel safely side by side within the lane.

(4) When approaching a place where a right turn is authorized.

(b) Any person operating a bicycle upon a roadway of a highway, which highway carries traffic in one direction only and has two or more marked traffic lanes, may ride as near the left-hand curb or edge of that roadway as practicable.

It is recommended that Municipal Code Section 10.20.090 be updated in order to achieve consistency with the current California Motor Vehicle Code.

The Mount Shasta Municipal Code (Section 10.20.090) prohibits sidewalk riding, although the prohibition is not strictly enforced. Many cyclists feel safer riding on the sidewalk than on the street with traffic. However, unless the sidewalk is adjacent to low-speed, low-volume streets and the cyclist is riding slowly, sidewalk riding can be less safe than riding with traffic on the street. Cyclists riding on sidewalks can be obstructed from view by cars parked along the street and landscaping. In addition, motorists do not expect to see cyclists on sidewalks, and may turn into a cyclist as they are crossing a driveway or intersection. If cyclists must ride on the sidewalk, they should ride slowly, ride with the flow of traffic, not against it, should walk across streets in crosswalks and should be aware of drivers entering and exiting driveways and side streets.

In some cases, sidewalk riding may be appropriate, especially for children traveling along a road with higher speed traffic. Despite the circumstances, children and adults should know that sidewalk riding presents the same potential challenges for all users. An alternative to outright prohibition of sidewalk riding would require sidewalk travel at a low speed, an audible warning and yielding to pedestrians. Modification of the existing municipal code language would give police and the public a clear understanding of appropriate, safe and polite sidewalk riding behavior. A suggested example ordinance, from the City of San Rafael CA is included below. This ordinance would allow sidewalk riding in all areas unless specifically prohibited. This would replace section 10.20.130. Enforcement and education focusing on the the risks involved with sidewalk riding should accompany any code changes.

Chapter 5.34 REGULATION OF SKATEBOARDS, ROLLER SKATES, BICYCLES AND ELECTRIC PERSONAL ASSISTIVE MOBILITY DEVICES (EPAMD'S)

5.34.010 Skateboard, roller skates, bicycles and electric personal assistive mobility devices (EPAMD'S) prohibited in certain areas.

5.34.020 Posting of signs prohibiting skateboards, roller skates, bicycles, or electric personal assistive mobility devices (EPAMD'S).

5.34.030 Skateboards, roller skates, bicycles and electric personal assistive mobility devices (EPAMD'S) violating rights-of-way.

5.34.040 Exceptions--Police officers.

5.34.010 Skateboard, roller skates, bicycles and electric personal assistive mobility devices (EPAMD'S) prohibited in certain areas.

In any area where official signs are posted prohibiting such acts, it is unlawful for any person to ride any skateboard or similar device, or to skate using roller skates, on the public sidewalk or street. In any area where official signs are posted prohibiting such acts, it is unlawful for any person to ride a bicycle, an electric personal assistive mobility device (EPAMD), or similar devices on the public sidewalk or other public place. (Ord. 1800 § 3, 2003; Ord. 1475 § 1 (part), 1984).

5.34.020 Posting of signs prohibiting skateboards, roller skates, bicycles, or electric personal assistive mobility devices (EPAMD'S).

The city manager is authorized to post or cause to be posted signs prohibiting skateboarding, roller skating, bicycling, electric personal assistive mobility devices (EPAMD'S), or other similar devices or activities on public sidewalks or streets or in other public places, as provided by Section 5.34.010 and as designated by resolution of the city council. (Ord. 1800 § 4, 2003: Ord. 1475 § 1 (part), 1984).

5.34.030 Skateboards, roller skates, bicycles and electric personal assistive mobility devices (EPAMD'S) violating rights-of-way.

No person shall ride or propel a skateboard or roller skate in any roadway or upon any public sidewalk, nor shall any person ride a bicycle or an electric personal assistive mobility device (EPAMD) upon any public sidewalk or in any public place in such manner as to violate the right-of-way of any vehicle or pedestrian. (Ord. 1800 § 5, 2003: Ord. 1475 § 1 (part), 1984).

5.34.040 Exceptions--Police officers.

Notwithstanding Section 5.34.010, it shall not be unlawful for a person engaged in the course and scope of employment as a police officer for the city, to ride a bicycle on a public sidewalk or to ride an electric personal assistive mobility device (EPAMD) on a public sidewalk or in a public place in an area posted with a sign prohibiting such acts. (Ord. 1800 § 6, 2003: Ord. 1668 § 1, 1994).

Addressing Diagonal Back-in Parking

Mount Shasta utilizes diagonal head-in parking as a design standard on many streets in the downtown area (e.g., Chestnut Street and East Castle Street). This practice has several potential advantages over traditional parallel parking, including:

- More parking spaces per block
- Creation of larger curb extensions on many corners
- Traffic calming due to reduced travel lane width and slower average motor vehicle speeds

Despite these benefits, head-in diagonal parking is dangerous for roadway users, including cyclists and can increase the discomfort and willingness of cyclists to travel on streets with this type of parking facility. Both AASHTO's *Guide for the Development of Bicycle Facilities* and the *Oregon Bicycle and Pedestrian Plan* recommend against this practice, citing reduced sight distance for drivers of backing motor vehicles and a reduced ability of cyclists to see cars in motion because of screening by other parked cars. Additionally, the *Oregon Bicycle and Pedestrian Plan* states that, "these factors require cyclists to ride close to the center of a travel lane, which is intimidating to inexperienced riders."

"Back-in/Head-Out Parking Angle Parking" (2005), a report by Nelson\Nygaard Consulting Associates, cited benefits of back-in diagonal parking over parallel or head-in parking including:

- Decreased incidence of parking-related crashes and injuries
- Increased visibility for motor vehicle drivers, particularly of oncoming bicycles
- Improved access to curb ramps
- Loading/unloading out of the path of oncoming traffic

Many cities currently utilize back-in angled parking, including: Seattle, WA; Olympia, WA; Vancouver, WA; Portland, OR; Tucson, AZ; Austin, TX; Salt Lake City, UT; Indianapolis, IN; Wilmington DE, San Francisco, CA and Ventura, CA. Several cities have documented benefits of diagonal back-in parking; Pottstown, PA, for example, found a 25 percent reduction in the number of accidents as a result of back-in angled parking, and a 43 percent reduction in accidents resulting in injury.

This Plan recommends that head-in diagonal parking throughout Mount Shasta be replaced with back-in angle parking.

Addressing Snow Removal

The City should consider revising Municipal Code Chapter 12.24 to more prominently address snow removal from sidewalks and bikeways. Clearing facilities within a reasonable amount of time following a storm event can significantly improve conditions for winter walking. Feasibility of facility clearance will depend, to an extent, on availability of maintenance funds.

However, snow removal and treatment for ice on sidewalks is also a pedestrian accessibility issue, not an optional activity. The Federal Highway Administration (FHWA) has oversight responsibility for all sidewalks constructed with federal funds. An FHWA memorandum on snow removal released in August 2008 states that:

*“In accordance with [28 CFR § 35.133](#), a public agency must maintain its walkways in an accessible condition for all pedestrians, including persons with disabilities, with only isolated or temporary interruptions in accessibility. Part of this maintenance obligation includes reasonable snow removal efforts. See FHWA, *Questions and answers about ADA/Section 504, question 31 under Maintenance*, www.fhwa.dot.gov/civilrights/ada_qa.htm#q31.”⁵*

Additional guidance comes from US Access Board publication *Accessible Rights-of-Way: A Design Guide* Section 3.2.4.3 on Maintenance.

“Maintenance of pedestrian routes should also be considered a “program” of an entity covered by title II. Where abutters or owners of adjacent property are charged with responsibility to fund repairs or improvements or to clear snow from sidewalks, municipalities should consider how to ensure the accessibility of those routes.”

Because roadway plowing is defined as a government program, failure to plow the sidewalks could be found to be discrimination against both the disabled who can't drive, and other non-drivers.

Guidance from AASHTO's *Guide for the Planning, Design and Operation of Pedestrian Facilities (2004)* suggests that public works agencies adopt policies that require the “most heavily used pedestrian routes are cleared, including bus stops and curb ramps at street crossings so that snow plows do not create impassible ridges of snow.” Snow berms should not create new sight distance restrictions.

⁵ Memorandum from Butch Wlaschin Director, Office of Asset Management regarding Snow Removal on Sidewalks Constructed with Federal Funding (<http://www.fhwa.dot.gov/preservation/082708.cfm>) accessed October 10, 2008.

Implementation Recommendation

This Plan recommends that the City Council establish a permanent advisory body – The Bicycle and Pedestrian Advisory Committee. This body would advise on matters relating to planning of the city’s sidewalk, bikeway, street, trail and multi-use path systems, as well as future modification and expansion of those systems. This body should be involved at all stages of all transportation projects that may impact bicycle and pedestrian travel, and would be charged with:

- Involvement in planning, design and implementation stages of transportation projects.
- Aiding the city in pursuing funding to implement these projects.
- Coordinating with staff to maintain a prioritized project list for implementation.
- Working with school officials and city staff to implement projects relating to safe routes to schools.
- Acting as liaison with other government and non-government groups as necessary to coordinate plans and obtain funding.

2.5.3. ACTION ITEMS

ACTION ITEM 1

Provide safe pedestrian and bicycle routes on key streets leading to Mt. Shasta Elementary School, Sisson Middle School, Jefferson High School and Mt. Shasta High School.

ACTION ITEM 2

Provide pedestrian and bicycle routes to commercial and park areas.

ACTION ITEM 3

Develop clear north-south and east-west travel corridors through Mount Shasta Boulevard.

ACTION ITEM 4

Provide bicycle linkages between downtown and adjacent recreational areas.

Table 2.3a. Proposed Pedestrian Projects and Action Item Linkage

Name	From	To	"length(Feet)"	* Action Item
South Mount Shasta Boulevard	Bear Springs Road	Mountain View Drive	1,000	2,3
South Mount Shasta Boulevard	Mountain View Drive	Sisson Street	1,100	2,3
North and South Mount Shasta Boulevard	Sisson Street	East Ivy Street	1,000	2, 3
North Mount Shasta Boulevard	East Ivy Street	Hinkley Street	2,200	2,3
North Mount Shasta Boulevard	Hinkley Street	Nixon Road	1,800	2,3
Pine Street	West Lake Street	I-5	1,000	1, 2
East and West Lake Street	I-5	Washington Drive	500	2, 3
Chestnut Street	McCloud Avenue	North Mount Shasta Boulevard	1,700	2, 3
East and West Alma Street	Pine Street	Rockfellow Street	1,500	1, 2, 3

Name	From	To	"length(Feet)"	* Action Item
Rockfellow Drive	Everitt Memorial Highway	Adams Drive	1,000	1, 2
D Street/ Washington Drive/ Everitt Memorial Highway	Old McCloud Road	Mount Shasta High School	5,280	1, 2, 3

*Action Item

#1 Access to schools

#2 Access to commercial areas and parks

#3 Creating clear north/south and east/west travel corridors

#4 Recreation

Table 2.3b. Proposed Bicycle Projects and Action Item Linkage

Name	From	To	Type	*Action Item
City Park to Downtown Pathway	Springs at City Park	West Alma Street	Class I	2, 3, 4
Southern Railway Connector Pathway (Option I and II)	City limits	West Alma Street	Class I	2, 3, 4
Rotary Trail	East Alma Street	East Lake Street	Class I	1, 2, 4
McCloud River Railroad Pathway	Union Pacific Railroad	City limits	Class I	4
Shasta Avenue to North Mount Shasta Boulevard Pathway	Shasta Avenue	North Mount Shasta Boulevard	Class I	3, 4
High School Connector Pathway	Rockfellow Drive	McCloud Railroad	Class I	4
East Castle Street to Sisson Meadow Connector Pathway	City Park to Downtown Pathway	East Alma Street	Class I	3
Cedar Street Lassen Lane Connector	Lassen Lane	Cedar Street	Class I	3
Spruce Street Connector	East Alma Street	Rockfellow Drive	Class I	3
East and West Lake Street/Hatchery Lane	City limits	Washington Drive	Class II	2, 3, 4
D Street/Washington Drive/Everitt Memorial Highway	Old McCloud Road	Shasta Avenue	Class II	1, 2, 3
Rockfellow Drive	North Mt. Shasta Boulevard	City limits	Class II	1, 2, 3
East and West Alma Street	Cedar Street	Rockfellow Drive	Class II	1, 2, 3
North and South Mount Shasta Boulevard	City limits	Spring Hill Drive	Class II	2, 3
Pine Street	West Lake Street	City limits	Class II	1, 2, 3
Ream Avenue	City limits	South Mount Shasta Boulevard	Class II	3, 4
Spring Hill Drive	North Mount Shasta Boulevard	City limits	Class II	1,2,3
Shasta Avenue	Western terminus	Everitt Memorial Highway	Class III	3
Ski Bowl Drive	Rockfellow Drive	Shasta Avenue	Class III	3
East and West Castle Street	Maple Street	Sisson Meadows	Class III	2, 3
Mountain View Drive	South Mount Shasta Boulevard	Old McCloud Road	Class III	3
Sheldon Avenue	South Mount Shasta Boulevard	D Street	Class III	3
Mill Street	Sisson Street	Maple Street	Class III	3
Chestnut Street	McCloud Avenue	North Mount Shasta Boulevard	Class III	2, 3
McCloud Avenue	South A Street	North B Street	Class III	3
Maple Street	Mill Street	West Castle Street	Class III	3
Sisson Street	Mill Street	Mount Shasta Boulevard	Class III	3
South B Street	Old McCloud Road	Gaudenzio Street	Class III	3
Orem Street	South Mount Shasta Boulevard	Washington Drive	Class III	3

Name	From	To	Type	*Action Item
Smith Street	South Mount Shasta Boulevard	D Street	Class III	3
South A Street	Gaudenzio Street	McCloud Avenue	Class III	3
Gaudenzio Street	South A Street	South B Street	Class III	3
Ida Street	South Mount Shasta Boulevard	D Street	Class III	3
Cedar Street	Mount Shasta Elementary School	Northern terminus	Class III	3
East Ivy Street	North Mount Shasta Boulevard	Rockfellow Drive	Class III	3
North B Street/Birch Street	McCloud Avenue	East Lake Street	Class I/III	1, 2, 3,

*Action Item

#1 Access to schools

#2 Access to commercial areas and parks

#3 Creating clear north/south and east/west travel corridors

#4 Recreation

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CHAPTER 3. Existing Conditions

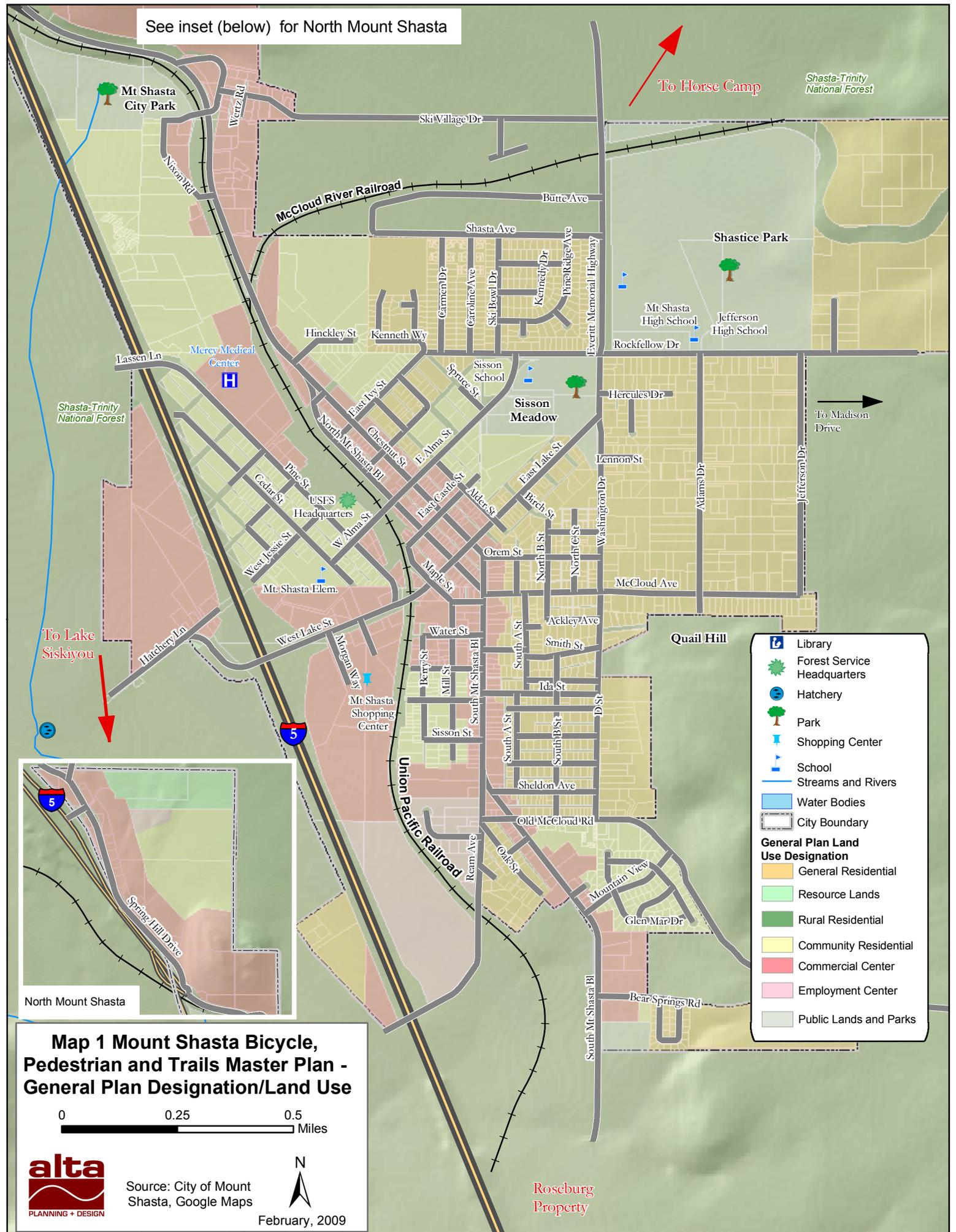
3.1. INTRODUCTION

This chapter provides a review and assessment of existing bicycle and pedestrian facilities in Mount Shasta. It first defines various bicycle infrastructure types, including on- and off-street facilities, and follows with a discussion of the existing bikeway system and a review of facilities. This chapter also reviews other bicycle infrastructure components, including signage, end-of-trip facilities, and multi-modal connections. The text briefly summarizes existing programmatic efforts to encourage bicycling, while the remainder of the chapter follows the same format regarding existing pedestrian conditions.

3.1.1. *Field Review*

A field review was conducted in two phases. An initial review was conducted on May 2, 2008 in conjunction with the project kick-off meeting. A second visit was conducted on August 8, 2008 in conjunction with a meeting of the Alternative Transportation Advisory Committee (ATAC). The field review was used to supplement existing information. Additional site observations and photographs were collected during an informal visit by Alta staff in late June 2008. General Plan designations and land use information is shown on Map 1. The locations of existing bicycle facilities are shown in Map 2 (p. 3-3).

See inset (below) for North Mount Shasta



To Horse Camp

Shasta-Trinity National Forest

Shastice Park

Mt Shasta High School
Jefferson High School

Mercy Medical Center

Sisson Meadow

To Madison Drive

Shasta-Trinity National Forest

To Lake Siskiyou

	Library
	Forest Service Headquarters
	Hatchery
	Park
	Shopping Center
	School
	Streams and Rivers
	Water Bodies
	City Boundary
General Plan Land Use Designation	
	General Residential
	Resource Lands
	Rural Residential
	Community Residential
	Commercial Center
	Employment Center
	Public Lands and Parks



North Mount Shasta

Map 1 Mount Shasta Bicycle, Pedestrian and Trails Master Plan - General Plan Designation/Land Use



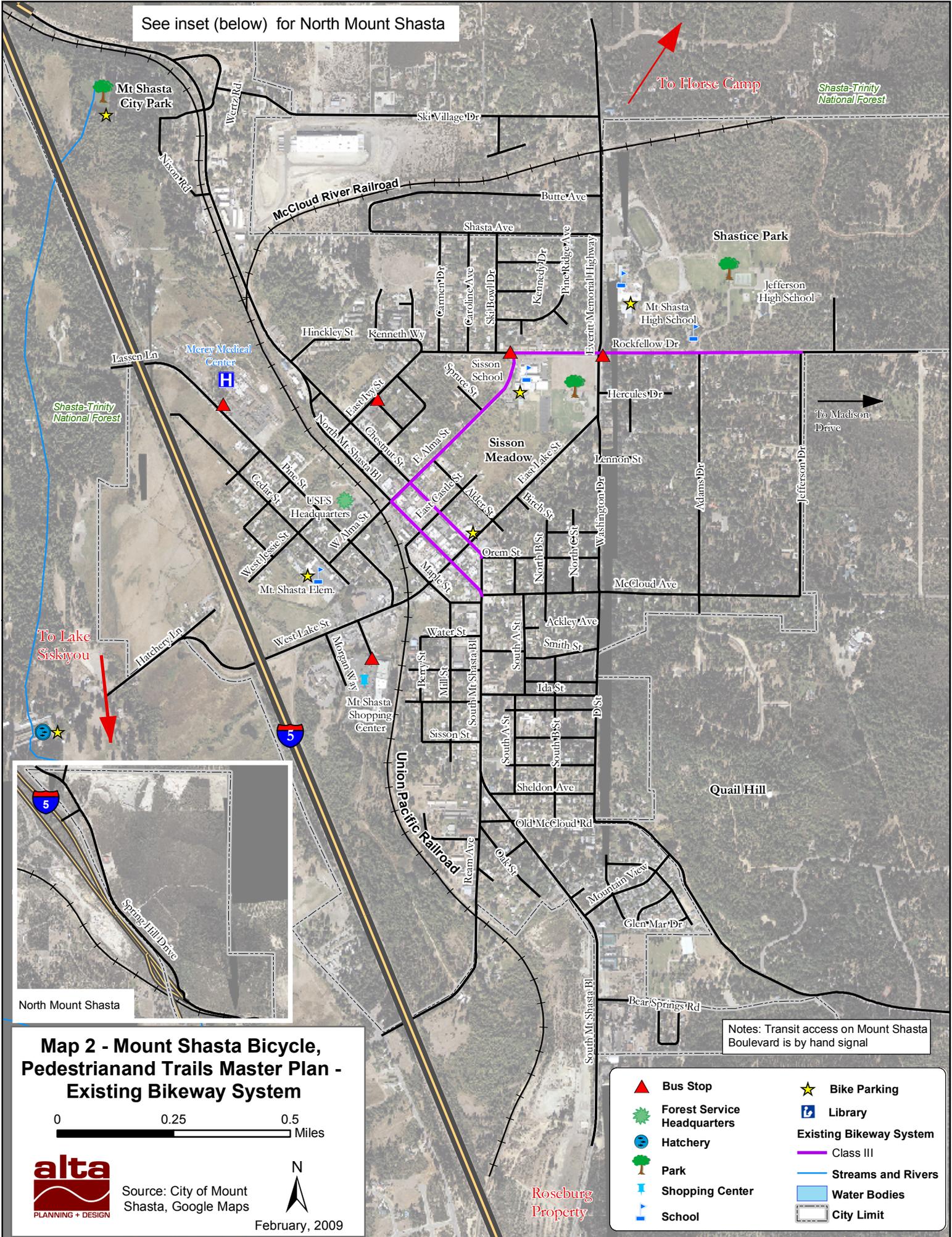
Source: City of Mount Shasta, Google Maps



February, 2009

Roseburg Property

See inset (below) for North Mount Shasta



To Horse Camp

Shasta-Trinity National Forest

Shastice Park

Jefferson High School

Mt Shasta High School

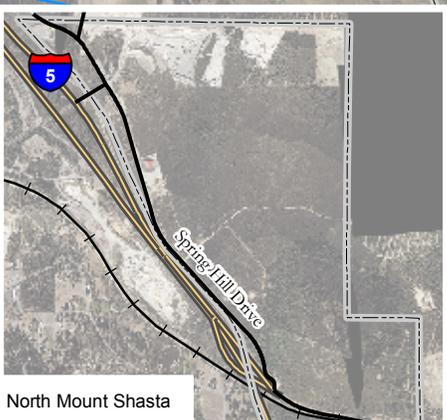
Mersey Medical Center

Lassen Ln

Shasta-Trinity National Forest

To Madison Drive

To Lake Siskiyou



North Mount Shasta

Notes: Transit access on Mount Shasta Boulevard is by hand signal

Map 2 - Mount Shasta Bicycle, Pedestrian and Trails Master Plan - Existing Bikeway System



Source: City of Mount Shasta, Google Maps



February, 2009

Roseburg Property

- | | |
|-----------------------------|--------------------------------|
| Bus Stop | Bike Parking |
| Forest Service Headquarters | Library |
| Hatchery | Existing Bikeway System |
| Park | Class III |
| Shopping Center | Streams and Rivers |
| School | Water Bodies |
| | City Limit |

3.2. BICYCLE FACILITIES

The three types of bikeways identified by Caltrans in Chapter 1000 of the Highway Design Manual are as follows:

Class I Bikeway. Typically called a “bike path,” a Class I bikeway provides bicycle travel on a paved right-of-way completely separated from any street or highway.

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 motor vehicle traffic and is identified only by signage. Optional “Shared Roadway” bicycle marking pavement stencils are also available for use on Class III bikeways.

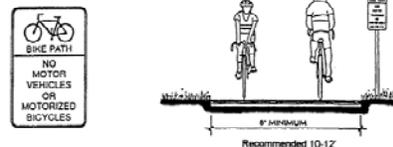
It is important to note that bicycles are permitted on *all* roads in the State of California and in Mount Shasta (with the exception of access-controlled freeways). As such, Mount Shasta’s entire street network is effectively the town’s bicycle network, regardless of whether or not a bikeway stripe, stencil, or sign is present on a given street. The designation of certain roads as Class II or III bicycle facilities is not intended to imply that these are the only roadways intended for bicycle use. Rather, the designation of a network of Class II and III on-street bikeways recognizes that certain roadways are optimal bicycle routes, for reasons such as directness or access to significant destinations, and allows the City of Mount Shasta to focus resources on constructing this primary network. No money has been spent on dedicated bicycle facilities within the last five years.

3.2.1. Existing Bikeways

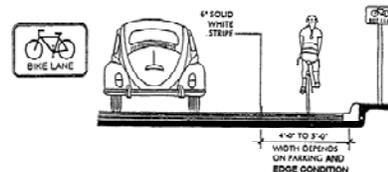
The current bikeway network within the city is comprised mainly of unmarked, unsigned shared streets. The rights-of-way on many streets throughout the downtown area offer adequate room for the inclusion of future Class II or III facilities. Currently, motor vehicle traffic is fairly light and many people even bike on roads with the heaviest traffic, such as Mount Shasta Boulevard. Mount Shasta is experiencing gradual population growth, resulting in higher traffic volumes on many roads; therefore, there is a growing need for additional designated facilities for cyclists.

Several trails exist within the City of Mount Shasta:

Class I Bike Path



Class II Bike Lane



Class III Bike Route



Class I, II and III bicycle facilities.



Railroad right-of-way



Railroad crossing at Alma Street.

- Napenthe Trail on the Mercy Medical Hospital Campus
- Centennial Park walking trail
- Sisson Meadow Boardwalk

These trails provide limited options for bicycle and pedestrian travel due to their lack of connectivity to a larger trail network.

One key north-south bicycling route, Everitt Memorial Highway, has a very wide right-of-way that skirts the eastern edge of the city and passes within a block of three of the four schools in town. Though lacking any specific bicycle facility designations, this popular cyclist route also provides access to many downhill mountain bike trails on Mount Shasta.

Designated Class III bicycle routes follow parts of Rockfellow Drive, Alma Street, Chestnut Street, and Mount Shasta Boulevard shown in Map 2 (p 3-3). In addition, there are several north-south running gravel alleyways for utilities and emergency access that are currently used by pedestrians and cyclists.



Low vertical clearance on I-5 bridges

Pine Street/Lassen Lane and Ream Avenue provide valuable non-interchange crossings of I-5 on the north and south ends of the city. Non-interchange freeway crossings provide an opportunity for bicyclists to traverse these barriers without the complication and hazards of on- and off-ramps. Low railing and bridge fencing create potential hazards for bicycle travel on all overpasses.

To the west of I-5 (and partially outside of the city limits), W. A. Barr Road and Old Stage Road together provide an important north-south route connecting to the Mount Shasta Fish Hatchery, Lake Siskiyou and its adjacent trail resort areas and mountain bike trails. However, shoulders on these roads are quite variable, making them problematic for most cyclists.

3.2.2. *Signage*

Implementing a well-designed, attractive, and functional system of network signage greatly enhances bikeway facilities by promoting their presence to both potential and existing users. The ability to navigate through a town or city is informed by landmarks, natural features, and other visual cues. A signage system is a key component of a navigable environment and informs pedestrians, bicyclists, and motorists, while also enhancing a city's identity. An effective wayfinding system communicates information clearly and concisely. Placing signs throughout the bikeway system indicating to bicyclists and pedestrians their direction of travel,



Green MUTCD Bike Route Sign

location of destinations, and the time/distance to those destinations will increase users' comfort and accessibility to the bicycle and pedestrian system. Wayfinding signs are a relatively cost-effective means for improving the walking and bicycling environment.

Currently Mount Shasta utilizes a standard Manual on Uniform Traffic Control Devices (MUTCD) green bikeway sign to identify Class III routes. The city may choose to design unique directional signage to add to replace the more standard signage as a future project.

Class III route signs exist along routes shown on Map 2 (p. 3-3).

3.2.3. *Bikeway Support Facilities*

Bicycle Parking

The availability of secure, visible bicycle parking can strongly influence one's decision to complete a trip via bicycle. In Mount Shasta, the quantity of bicycle parking facilities varies by location. Bicycle racks exist at several commercial locations and schools.

Most parking facilities consist of a rack located in a parking lot or near a building entrance. Most racks identified by the project team were older, less desirable types such as "wheel bender" racks. Some existing racks are considered substandard because they do not allow a bicycle frame and at least one wheel to be locked to the rack without the use of a long bicycle cable, and they do not provide two points of support for a bicycle. These are often referred to as "wheel bender racks" because of the tendency for the restrained front wheel of a bicycle parked in the rack to be bent when the bicycle either falls over or is pushed over. The shortage of quality bicycle racks in high-demand locations typically generates informal bicycle parking activities with cyclists securing their bikes to railings, street signs, light poles and other objects.



An example of inverted "U" bike racks



Existing bike parking at Mount Shasta High School.

Bicycle racks exist outside the Police Station, Mount Shasta City Hall, Mount Shasta City Park, at Mount Shasta Elementary School, Sisson School, Mount Shasta High School and the Fish Hatchery. See Map 2 (p. 3-3) for known bicycle parking locations.

Public restrooms at the City Park, Shastice Park and the Fish Hatchery are available with changing facilities. Currently there are no known publicly accessible shower facilities, although such facilities may exist in private buildings. These facilities are shown on Map 2 (p. 3-3)



Existing bike parking at the Mount Shasta Police Station.

3.2.4. *Safety Education and Encouragement Programs*

Existing bicycle safety and education programs include an annual bicycle rodeo conducted by the Fire Department, and an annual bicycle helmet give away conducted by the Police Department. A survey of education and encouragement programs available at Mount Shasta schools revealed the following results:

- Mount Shasta Elementary School: Does not allow students to walk or bike to school alone and does not provide any bicycle or pedestrian education. Not many children walk or bike to school, but if they do they must walk/bike with a parent. There are no organized walking or biking ‘trains’ or ‘buses’.
- Sisson School: No information was available.
- Jefferson High School: No information was available.
- Mount Shasta High School: The school does not provide bicycle or pedestrian education programs. Not many children walk or ride to school.

Snow Removal

Snow removal in the City of Mount Shasta is governed by Chapter 12.24 of the Municipal Code. Section 12.24.010 declares that “city streets and travel portions of public rights-of-way, to the degree that is reasonable and practical, [shall] be kept clear of snow, ice and other obstructions.”

According to existing code (Section 12.24.015), snow plowing or removal is required “whenever snow or ice conditions exist” as determined by the Public Works Director. Snow is typically piled into a berm that can reach 6-10 feet tall after high volume events. After a major storm event, berms typically extend into the sidewalk area, creating challenging conditions for pedestrian travel. Snow is also piled or plowed into areas of the roadway where bike lanes would typically be found. Given enough time between events, the berms are removed by dump truck to snow storage areas such as the one near the intersection of Everitt Memorial Highway and Rockfellow Drive.

Mount Shasta Municipal Code Section 12.24.075 “Mandatory Areas for Snow Removal” gives City Council the power to designate areas where sidewalk snow removal shall be mandatory. In these cases, snow removal shall be the responsibility of owners or occupants of properties abutting the sidewalk. Currently, snow removal is mandatory within the downtown shopping area. This area shares the same boundaries as the downtown parking district.

The City of Mount Shasta Municipal Code does not explicitly require snow removal on sidewalks not located within the Business Improvement District. The challenges involved with snow removal in Mount Shasta include volume, frequency of storm events and associated costs.

3.2.5. *Multi-Modal Connections*

Mount Shasta is served by the Siskiyou County STAGE transit system, which provides a variety of scheduled transit pick-ups as well as on-call service throughout the County. Service is generally available between 7:00 AM and 5:00 PM, Monday through Friday. Transit vehicles are equipped to carry bikes during daylight savings time. The I-5 and Mount Shasta routes, which provide primary service to the city, stops at the following locations, shown on Map 2 (p. 3-3):

- All along Mount Shasta Boulevard – Bus will stop for any passenger that signals it.



Existing pedestrian amenities

- Mercy Hospital at 914 Pine Street
- The Mount Shasta Shopping Center at the end of Commercial Way, at the bus shed
- The intersection of East Alma Street and Rockfellow Drive.
- The intersection of Rockfellow Drive and Washington Drive
- The intersection of East Ivy Street and Alder Street.

Bicycle Loop Detectors

Providing Bicycle Loop Detectors (BLDs) involves the installation or calibration and marking of in-pavement induction loops so that they are sensitive to bicycles and identifiable by bicyclists. The City of Mount Shasta has not installed bicycle loop detectors at any of its four signalized intersections. State legislation was passed in 2007 (Assembly Bill 1581) that requires the city to install such loop detectors if any new signals are installed or existing signals are improved, if this installation is feasible and conforms to professional engineering practices. The California Manual of Uniform Traffic Control Devices (CA MUTCD) also requires that signal timing and detection on bikeways be adjusted to accommodate the needs of bicyclists.

3.3. PEDESTRIAN AND TRAIL FACILITIES

Definition of Pedestrian Facilities

Generally, there are two types of pedestrian facilities, those intended for exclusive use by pedestrians, such as sidewalks, and those shared with other users (e.g., Class I Shared-use Pathways). In addition, in California sidewalks can be legally used by cyclists under the age of 12 unless otherwise signed or locally regulated. Section 10.20.090 of the Municipal Code prohibits sidewalk riding, although the prohibition is not strictly enforced. Pedestrian facilities at intersections can include crosswalks, pedestrian crosswalk signals, warning signage, curb ramps and other treatments to promote safety and accessibility for disabled users.

The California Vehicle Code Section 275 defines a crosswalk as either:

- That portion of a roadway included within the prolongation or connection of the boundary lines of sidewalks at intersections where the intersecting roadways meet at approximately right angles, except the prolongation of such lines from an alley across a street.
- Any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface.



Mt. Shasta Boulevard at Castle Street.



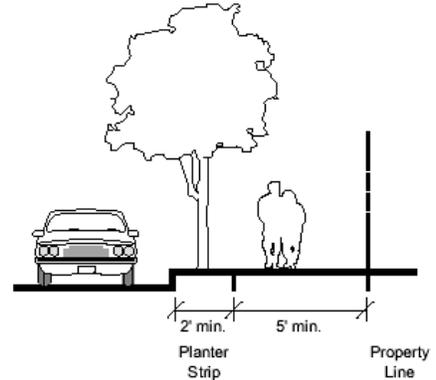
Sidewalks outside of town vary by location.

At intersections, a crosswalk is effectively a legal extension of the sidewalk across the roadway. Crosswalks are present at all intersections, whether marked or unmarked, unless the pedestrian crossing is specifically prohibited by the local jurisdiction. At mid-block locations, crosswalks only exist if they are marked.

Traffic control devices must follow the procedures set forth in the CA MUTCD, while elements such as sidewalks and curb cuts must comply with guidelines for implementing the federal Americans with Disabilities Act (ADA) and applicable provisions of the California Building Code (Title 24).

3.3.1. Existing Walkways

There are existing sidewalks on many of the roadways within the city limits. Newly repaved sidewalks in the downtown area have curb ramps and well-marked crosswalks. With the exception of most sidewalks within the downtown area, many of these walkways do not meet ADA requirements for width, obstructions, tripping hazards or curb ramps. Sidewalk gaps are a significant problem in some parts of the city.



Older sidewalks outside the downtown area generally lack curb ramps, are non-continuous, and many have faded crosswalk striping. Additionally, many residential streets do not have sidewalks, but have a paved or unpaved shoulder within a wide existing right-of-way that serves as an informal pedestrian facility.

Mount Shasta Boulevard, the main north-south surface street, has wide sidewalks on both sides of the road and signalized crosswalks at the two signalized intersections in the downtown area. The parallel streets (Pine and Chestnut) also have sidewalks in the vicinity of downtown. Pine Street has a formal sidewalk on the west side of the road, and a small unpaved path on the east side of the road. Outside of the immediate downtown area, the sidewalk on the east side of Pine is intermittent.



Pedestrians crossing the railroad at Alma Street

The following summarizes the existing pedestrian facilities within the downtown area:

Mount Shasta Boulevard:

- Sidewalks on both sides through downtown
- Parallel parking on both sides

Lake Street:

- Sidewalks on both sides throughout downtown
- Crosses railroad two blocks west of Mount Shasta Boulevard



A wide intersection at Everitt Memorial Highway and Rockfellow Street

- Parallel parking on both sides

Maple Street:

- Sidewalks on both sides (north & south)
- Parallel parking one block north of Lake Street

RR Crossing at Lake Street:

- Visitor center just to the south of Lake Street west of the tracks

RR Crossing at Alma Street:

- Sidewalk on south side of road
- Gravel path on north side of road
- Marked, mid-block crosswalk west of the tracks at the USFS offices.

Railroad Corridor:

- Flanked by wetlands downtown

A partial survey of pedestrian priority corridors undertaken by the ATAC revealed sidewalk gaps on all streets surveyed including:

- North and South Mount Shasta Boulevard
- Cedar Street
- Pine Street
- East and West Lake Street
- Chestnut Street
- Old McCloud Road
- Rockfellow Drive
- D Street/ Washington Drive / Everitt Memorial Highway



Shastice Park

Existing Crosswalks and Other Facilities

Pedestrian exposure at intersections directly affects safety, especially for older persons and children who may not be able to cross streets quickly or discern (or be seen by) oncoming traffic. Crosswalks marked at intersections use a standard configuration of two parallel white lines. Crosswalk lines are yellow at designated school crossings. Crosswalks are marked at many intersections downtown and near schools.

Several intersections in Mount Shasta are signalized and include pedestrian crossing amenities:

- East Lake Street and Mount Shasta Boulevard – push button pedestrian actuation
- Commercial Way and West Lake Street – push button pedestrian actuation

- East Alma Street and North Mount Shasta Boulevard – signal is timed, no pedestrian actuation

Barriers to Pedestrian and Bicycle Travel

There are natural and man-made barriers to pedestrian and bicycle travel within the city. These include snow berms that accumulate during the winter months that may create challenging crossing conditions at marked and unmarked crossings.

Mount Shasta Boulevard south of Lake Street and north of Alma Street has limited safe crossing opportunities. The speed limit in this area is higher than in the downtown areas, and the roadway serves high volumes of pass-through traffic.

3.3.2. *Pedestrian Trails and Paths*

Shared-use trails are defined and discussed earlier in this chapter.

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CHAPTER 4. Needs Analysis

4.1. WALKING AND BIKING IN MOUNT SHASTA

General User Profile

Many people in Mount Shasta already walk and/or bike for recreation or transportation. According to a survey done in 2007 by the Alternative Transportation Advisory Committee (ATAC) that included nearly 326 respondents, nearly 80 percent of households reported having at least one adult who walks regularly and nearly 70 percent reported one or more adults bicycling regularly. The results for adults closely match the walk and bike patterns of children – about 70 percent of households reported having one or more children that walks and/or bikes regularly.⁶ For comprehensive survey documentation, please see Appendix C.

During summer months (May – September) about 80 percent of respondents reported walking daily or nearly daily for pleasure, about 30 percent reported walking to work at least once a week and 40 percent ran errands or went shopping on foot. For the same time period, about 80 percent reported biking at least once a week for recreation or fitness, but only 25 percent report cycling to work and 30 percent ran errands or went shopping by bike.

Despite relatively high reported levels of activity, there was stated support for increased levels of walking and biking. Nearly 80 percent of respondents cited barriers to walking and biking which prohibited them from increasing their levels of either or both activities. When asked what affected their choice not to walk, the five reasons cited most commonly were⁷:

- Bad weather
- Destination too far/takes too long
- Lack of sidewalks
- Fear of cars/drivers
- Convenience/comfort of car



A lack of sidewalks deters people from walking in Mount Shasta.

⁶ The Survey Report notes that “There is strong evidence that a number of online surveys were completed consecutively from the same computer one immediately after the other. This is assumed to mean that some people chose to complete more than one survey in an attempt to sway the results of the survey.” Then goes on to say “The number of completed surveys reduced the impact of the cheaters to a low enough level that the effort was not made to edit the data. No attempt was made to prevent participation by people living outside the city. No exclusion of respondents was considered or implemented.

⁷ Percentage of non-neutral responses for “very much” and “extremely affects” were aggregated to determine the top five responses

When asked space what affected their choice not to bike, the five reasons cited most commonly were:

- Lack of bikeways or bike lanes
- Bad weather
- Fear of cars/drivers
- Destination too far/takes too long
- Lack of bike parking

Many of these reasons were also listed by parents as reasons they chose not to let their children walk or bike more.

The remainder of this section will discuss the general needs of cyclists and pedestrians in Mount Shasta.

Commuter and Recreational Bicycle Needs Analysis

The purpose of reviewing the needs of recreational and commuter bicyclists is twofold: it is instrumental when planning a system that must serve both user groups, and it is useful when pursuing competitive funding and attempting to quantify future usage and benefits to justify expenditures of resources. An April 2003 national survey conducted by America Bikes showed that Americans want to bicycle more and support building infrastructure to achieve this: “Over half of Americans (52 percent) want to bike more than they do now and a majority of the public (53 percent) favors increasing federal spending to build more bike paths for easier and safer bicycling.”

The 2007 ATAC survey indicated that nearly 80 percent of adults would walk and ride more, and 80 percent of parents would let their children ride more if barriers were removed. In short, there is a large reservoir of potential bicyclists and pedestrians in Mount Shasta who don't ride or walk (or do so more often) simply because they do not feel comfortable using the existing street system and/or don't have appropriate bicycle facilities at their destination.

Key general observations about bicycling needs in Mount Shasta by group include:

Bicyclists are typically separated between experienced and casual riders.

The U.S. Department of Transportation identifies thresholds of traffic volumes, speeds, and curb lane widths where less experienced bicyclists begin to feel uncomfortable. For example, on an arterial with traffic moving between 30 and 40 miles per hour, less experienced bicyclists require bike lanes while more experienced bicyclists require a 14 or 15 foot wide curb lane.

Casual riders include those who feel less comfortable negotiating traffic.

Others, such as children and the elderly, may have difficulty gauging traffic, responding to changing conditions, or moving rapidly enough to clear intersections. Other bicyclists, experienced or not, may be willing to sacrifice time by avoiding heavily traveled arterials and using quieter side streets. In some cases, casual riders may perceive side streets (or sidewalks) as being safer alternatives than major through routes. Other attributes of the casual bicyclist include shorter distances ridden than the experienced rider and unfamiliarity with many rules of the road. The casual bicyclist will benefit from route markers, bike lanes, wider curb lanes, and educational programs. Casual bicyclists may

also benefit from marked routes that lead to parks, museums, historic districts, and other visitor destinations. In Mount Shasta, many riders mention a fear of cars. These riders may feel more comfortable on lower traffic roads.

Experienced bicyclists include those who prefer the most direct, through route between origin and destination, and a preference for riding within or near the travel lanes.

Experienced bicyclists negotiate streets in much the same manner as motor vehicles, merging across traffic to make left turns, and avoiding bike lanes and shoulders that contain gravel and glass. The experienced bicyclist will benefit from wider curb lanes and loop detectors at signals. The experienced bicyclist who is primarily interested in exercise will benefit from loop routes that lead back to the point of origin.

Bicycles themselves range in cost from about \$350 to over \$12,000 for adult models.

The most popular bicycle types today are hybrid, commuter and mountain bikes. These relatively light weight bicycles feature relatively wide tires that can handle both on-road and off-road conditions, from 10 to 27 gears, and upright handlebars. Advanced versions have features such as front and rear shocks to help steady the rider on rough terrain. The 10-speeds of years past have evolved into a sophisticated ultralight ‘road bicycle’ that is used primarily by the serious long distance adult bicyclist.

Who rides bicycles?

While the majority of Americans (and Mount Shasta residents) own bicycles, most of these people are recreational riders who ride relatively infrequently. School children between the ages of about 7 and 12 make up a large percentage of the bicycle riders today, often riding to schools, parks, or other local destinations on a daily basis weather permitting. The serious adult road bicyclist who may participate in races, ‘centuries’ (100 mile tours) and/or ride for exercise makes up a small but important segment of bikeway users, along with serious off-road mountain bicyclists who enjoy riding on trails and dirt roads. The single biggest adult group of bicyclists in Mount Shasta is the intermittent recreational rider who generally prefers to ride on low speed, low traffic streets.

Bicycle Commuter Needs

Commuter bicyclists in Mount Shasta range from employees who ride to work, to children who ride to school, to people riding to shops. Bicycling requires shorter commutes, which runs counter to most land use and transportation policies which encourage people to live farther and farther from where they work. Access to transit helps extend the commute range of cyclists, but does not aid commuters during winter months (off-daylight savings time) when transit does not carry bicycles. Despite these facts, Mount Shasta has a great potential to increase the number of people who ride to work or school because of the small size of the city, moderate density residential neighborhoods near employment centers, a favorable summer climate, and a high percentage of work trips that are less than 15 minutes.



Cyclists come in a range of ages and skill levels.

Key bicycle commuter needs in Mount Shasta are summarized below.

- Commuter bicycling typically falls into one of two categories: adult employees, and younger students (typically ages 7-15). In Mount Shasta, about 30 percent of adults and 30 percent of children ride to school or work at least once a week when weather permits.
- Commuter trips range from several blocks inside the city limits to several miles or more for those commuters traveling beyond the city limits.
- Commuters typically seek the most direct and fastest route available, with regular adult commuters often preferring to ride on arterials rather than side streets or off-street facilities.
- Commute periods typically coincide with peak traffic volumes and congestion, increasing the exposure to potential conflicts with vehicles.
- Places to safely store bicycles are of paramount importance to all bicycle commuters. About 24 percent of survey respondents cited lack of bicycle parking as a barrier to increased riding.
- Major commuter concerns include changes in weather (rain or snow), riding in darkness, personal safety and security. Over 50 percent of respondents reported that poor weather was a barrier to increased cycling.
- Rather than be directed to side streets, most commuting adult cyclists would prefer to be given bike lanes or wider curb lanes on direct routes.
- Commuters generally prefer routes where they are required to stop as few times as possible, thereby minimizing delay.
- Many younger students (ages 7-11) use sidewalks for riding to schools or parks, which is acceptable in areas where pedestrian volumes are low and driveway visibility is high. Where on-street parking and/or landscaping obscures visibility, sidewalk riders may be exposed to a higher incidence of crashes. Older students (12 years or older) who consistently ride at speeds over 10 mph should be directed to riding on-street wherever possible.

Recreational Needs

The needs of recreational bicyclists in Mount Shasta must be understood prior to developing a system or set of improvements. While it is not possible to serve every neighborhood street and every need, a good plan will integrate recreational needs to the fullest extent possible. The following points summarize recreational needs:

- Recreational bicycling in Mount Shasta typically falls into one of three categories: exercise, touring and mountain biking.
- Recreational users range from healthy adults to children to senior citizens. Each group has their own abilities, interests, and needs.
- Directness of route is typically less important for recreational cyclists than routes with fewer traffic conflicts. Visual interest, shade, protection from wind, or moderate gradients play a greater role in route choice
- People exercising or touring often (though not always) prefer a loop route rather than having to back-track.



Recreational and utilitarian cyclists alike need good end of trip facilities, such as secure bicycle storage.

- Recreational cyclists include those wanting to access open space that could benefit from clearly signed routes to reach bike-legal trailheads and hiking trailheads where bike racks should be provided.

4.2. WALKING IN MOUNT SHASTA

The extent of bicycling and walking in a community has been described as a barometer of how well that community is advancing its citizens' quality of life. Streets that are busy with bicyclists and walkers are considered to be environments that work at a human scale, and foster a heightened sense of neighborhood and community. In order to promote continued and increased levels of walking in Mount Shasta, it is important to consider the specific needs of various user groups.

Accommodating People with Disabilities

With the advent of the Americans with Disabilities Act (ADA) in 1990, the nation recognized the need to provide equal access to all residents. Since its inception, the ADA has significantly changed the design requirements for the construction of public space. However, much of the pedestrian environment built prior to the ADA's inception does not adequately accommodate people with disabilities.

It is important to note that a pedestrian environment that is strategically built to be accessible for people with disabilities is also more accessible for all. Curb ramps, for instance, can accommodate strollers, shopping carts and dollies for the movement of goods. Accessible intersection crossings can increase the safety for people regardless of ability.

In order to adequately plan the pedestrian environment for people with disabilities, the Plan must take into account each of the disabilities and the limitations they present. It is also important to be aware of how planning for people with one disability affects people with another. For example, gradual ramps and smooth transitions to the street help people in wheelchairs, but present challenges for the sight-impaired if they cannot easily find the end of the sidewalk and beginning of the street. Additionally, the Plan should also consider the needs of children and older adults.



Cracking and heaving of sidewalks creates challenging travel conditions.

The section below identifies populations whose needs must be taken into account in creating an accessible pedestrian environment.

People with Mobility Impairments

People with mobility impairments range from those who use wheelchairs, crutches, canes, orthotics, and prosthetic devices, to those who do not use such devices but face constraints for many reasons when walking long distances, on non-level surfaces, or on steep grades. Curb ramps are particularly important to people with mobility impairments. Prosthesis users often move slowly and often have difficulty with steep grades or cross slopes.

People with mobility impairments are affected by:

- Uneven surfaces that hinder movement or cause loss of balance
- Rough surfaces that make rolling difficult, cause a loss of balance, or cause pain especially for people with back injuries
- Steep uphill slopes that can make movement slow or impossible
- Steep downhill slopes that can cause a loss of control or are difficult to negotiate
- Cross slopes that cause instability or loss of balance
- Narrow sidewalks that impede the ability of users to turn or to cross paths with others
- Devices that are hard to reach, such as push buttons for walk signals and doors
- Long distances
- Situations that require fast reaction time
- Signalized walk phases that are shorter than the time it takes for them to cross the street

People with Sensory Impairments

People with sensory impairments include those who are partially or fully blind or deaf. They also include people whose perception of touch or balance is not good, as well as those who are color blind.

Visually impaired people have the following characteristics:

- Limited or no perception of the path ahead
- Limited or no information about their surroundings, especially in a new place
- Frequently changing environments, which they cannot commit to memory
- Inability to react quickly
- Inability to distinguish the edge of the sidewalk from the street
- Compromised ability to detect the proper time to cross a street
- Compromised ability to cross a street along the correct path (especially when a curb ramp is oriented diagonally toward an intersection's center point)
- Need for more time to cross the street

Hearing impaired people rely on visual information, which is often inadequate. They face most of their mobility difficulties in not being able to hear approaching vehicles and not being able to detect the time of their arrival. This is especially an issue in locations with limited sight distances, such as where streets curve or landscaping blocks the view.

People with Cognitive Impairments

People with cognitive impairments encounter difficulties in thinking, learning, responding, and performing coordinated motor skills. Cognitive disabilities can cause some to become lost, or to have difficulty finding their way. They may also not understand standard street signage. People who are not able to read benefit from signs with symbols and colors.

Children and Other Adults

Children and many older adults do not fall under specific categories for disabilities, but must be taken into account in pedestrian planning. Children are less mentally and physically developed than adults. They have the following characteristics:

- Less peripheral vision
- Less ability to judge speed and distance
- Difficulty locating sounds
- Read less than adults or not at all, so do not understand text signs
- Sometimes act impulsively or unpredictably
- Lack familiarity with traffic
- Face difficulty carrying packages

Older adults often exhibit degrading sensory or physical capabilities. This can cause them to:

- Gradually lose vision, especially at night
- Have decreased ability to hear sounds and detect where they come from
- Have less endurance; have less strength to walk up hills
- Have less balance, especially on uneven or sloped sidewalks
- React slowly to dangerous situations
- Walk slowly

As revealed in the 2007 ATAC survey results, about 40 to 45 percent of parents prevent their children from walking more often because of a 'lack of sidewalks' and a 'fear of cars.' Similarly survey respondents reported that their top reasons for walking less often were a 'lack of sidewalks' and a 'fear of cars'. As some of the most vulnerable pedestrians, the rating of an environment's perceived safety for children serves as a rough proxy of its quality. These survey results indicate that the top pedestrian needs in Mount Shasta are complete sidewalks and consideration of safe crossings at intersections (as these are the locations with the greatest amount of pedestrian/motor vehicle interaction).

4.3. COMMUTING AND AIR QUALITY ANALYSIS

Commute Patterns

A central focus of presenting commute information is to identify the current “mode split” of people that live and work in Mount Shasta. Mode split refers to the choice of transportation a person selects to travel to destinations, be it walking, bicycling, taking a public bus, or driving. One major objective of any bicycle or pedestrian facility improvement is to increase the percentage of people who choose to bike or walk rather than to drive or be driven. Every recovered vehicle trip or vehicle mile represents quantifiable reductions in air pollution and can help in lessening automobile traffic congestion.

Journey to work and travel time to work data were obtained from the 2000 US Census for Mount Shasta, Siskiyou County, the state of California, and the United States. Primary mode of journey to work for employed persons over 16 years of age is shown in Table 4.1. The numbers cited in the US Census are much lower than those reported in the ATAC survey. This is a widely recognized trend in bicycle and pedestrian trip data taken from the Census. Contributing factors include the time of year that the Census is conducted (April) and the wording of the question, which asks what type of transportation the respondent primarily uses when getting to work. The ATAC in comparison measures the percentage of the population that used a bike ‘one time or more’ a week on during the summer months.

Table 4.1. Mount Shasta Mode Split Compared to the County, State and Nation

Mode	Nationwide	Statewide	Siskiyou County	Mount Shasta
Bicycle	0.4%	0.8%	0.7%	1.2%
Walk	2.9%	2.9%	5.8%	4.6%
Public Transit	4.7%	5.1%	0.6%	0.0%
Drove Alone	75.7%	71.8%	70.2%	73.4%
Carpool	12.2%	14.5%	13.7%	10.9%
Other	0.8%	1.0%	0.6%	0.4%
Worked from Home	3.3%	3.8%	8.4%	9.6%
Data from US Census 2000				

Walking

Significantly more employed Mount Shasta residents older than 16 years walk to work than do their counterparts nationwide – 4.6 percent compared to 2.9 percent overall. Census data undercount pedestrian trips, as people tend to travel further to access jobs and are more likely to walk for non-work trips, which are not counted. In addition, the above numbers do not account for school children or people under 16, who do not have the ability to drive, or visitors who may walk to destinations in the city.

Bicycling

As shown, about 1.2 percent of all employed Mount Shasta residents commute primarily by bicycle. Census data do not include the number of people who bicycle for recreation or for utilitarian purposes – commuting only accounts for approximately one third of trips⁸ – students who bicycle to school, and bicycle commuters who travel from outside Mount Shasta, and are therefore likely to undercount true cycling rates. Recreational cycling is especially popular in Mount Shasta, and people come to visit the city with the express intent to bicycle recreationally.

Mount Shasta has a very low percentage of commuters who take public transit to work, likely due to the lack of readily available or convenient transit routes. Improving bicycle-on-bus facilities may be an opportunity to increase multi-modal commuting trips, as bicycles can increase the catchment area of the bus route.

Future Usage and Cost Benefits

Based on the data from the 2000 Census and estimates of pedestrian and bicycle mode share for commuters and students, the current number of daily walking commuters is estimated to be 405, and the number of current bicycle commuters is estimated to be 215, making 811 daily walking and 417 cycling trips.

Tables 4.2 and 4.3 quantifies the estimated potential reduction in Vehicle Miles Traveled (VMT) in Mount Shasta following a slight increase in pedestrian and bicycle mode, respectively, and estimate the reduction in air pollutants based on the best available local and national data. The existing levels of walking and bicycling result in an estimated decrease of 11,985 tons of PM10⁹, 324,913 tons of Nitrogen Oxides (NOx), 47,290 tons of Reactive Organic Gas (ROG), and 553,681 tons of carbon dioxide (CO2) each year.

Improvement in air quality will increase, assuming that as conditions for pedestrians and bicyclists improve, they will attract new Mount Shasta-based walkers and riders. The future improvements are calculated assuming a doubling of the bicycle commute to work mode share and bicycling. The estimated walk to work mode share assumes a doubling of commuters walking to work and a four percent increase in children walking to school. These goals, though ambitious, are not unrealistic. In addition, the same conditions may attract bicyclists to the city whose trips originate outside of Mount Shasta, or who do not live in the area. This analysis includes only Mount Shasta- based riders, although many riders may come from adjacent cities or may visit the city, especially as conditions for bicycling and walking improve.

Table 4.1. Air Quality Benefits from Walking

Variable	Figure	Source
Existing Commuting Statistics		
Study area population	7,183	2000 Census, STF3, P1.

⁸ National Household Transportation Survey, 2001

⁹ PM 10 is measure of particles in the atmosphere with a diameter of less than ten or equal to a nominal 10 micrometers.

Variable	Figure	Source
Employed population	3,302	2000 Census, STF3, P30.
Walk-to-work mode share	4.6%	2000 Census, STF3, P30.
Number of walk-to-work commuters	152	Employed persons multiplied by walk-to-work mode share
Work-at-home mode share	9.6%	2000 Census, STF3, P30.
Number of work-at-home walk commuters	158	Assumes 50% of population working at home makes at least one daily walking trip
Transit-to-work mode share	0.0%	2000 Census, STF3, P30.
Transit pedestrian commuters	0	Assumes 75% of transit riders access transit by foot.
School children, ages 6-14 (grades K-8)	863	2000 Census, STF3, P8.
School children walking mode share	11.0%	National Safe Routes to School surveys, 2003.
School children walk commuters	95	School children population multiplied by school children walking mode share
Total number of walk commuters	405	Total bike-to-work, school and utilitarian walking trips.
Total daily walking trips	811	Total walk commuters x 2 (for round trips)
Vehicle Trips and Miles Reduction		
Reduced Vehicle Trips per Weekday	277	Assumes 73% of walking trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	72,270	Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)
Reduced Vehicle Miles per Weekday	297	Assumes average round trip travel length of 1.2 miles for adults/college students and 0.5 mile for schoolchildren
Reduced Vehicle Miles per Year	77,532	Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)
Air Quality Benefits		
Reduced PM10 (tons/weekday)	5	Daily mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/weekday)	148	Daily mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/weekday)	22	Daily mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced PM10 (tons/year)	1,427	Yearly mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/year)	38,673	Yearly mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/year)	5,629	Yearly mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced CO2 (tons/year)	65,902	Yearly mileage reduction multiplied by 0.85 pounds per reduced mile
Future Commuting Statistics - 2026		
Future study area population	10,041	City of Mt. Shasta General Plan Update Project, Draft Environmental Impact Report, 2006
Future employed population	4,616	Based on proportion from Census 2000
Future walk-to-work mode share	9.2%	Doubling of 2000 Census, based on more complete network and results from ATAC Bicycling and Walking Survey, 2008.
Future number of walk-to-work commuters	425	Employed persons multiplied by walk-to-work mode share
Future work-at-home mode share	9.6%	Based on proportion from Census 2000

Variable	Figure	Source
Future number of work-at-home walk commuters	222	Assumes 50% of population working at home makes at least one daily walking trip.
Future school children, ages 6-14 (grades K-8)	1,206	Based on proportion from Census 2000
Future school children walking mode share	15.0%	Based on more complete network and results from ATAC Bicycling and Walking Survey, 2008.
Future school children walk commuters	181	School children population multiplied by school children walking mode share
Future total number of walk commuters	827	Total bike-to-work, school, college and utilitarian walking trips.
Future total daily walking trips	1,654	Total walk commuters x 2 (for round trips)
Future Vehicle Trips and Miles Reduction		
Reduced Vehicle Trips per Weekday	568	Assumes 73% of walking trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	148,155	Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)
Reduced Vehicle Miles per Weekday	614	Assumes average round trip travel length of 1.2 miles for adults/college students and 0.5 mile for schoolchildren
Reduced Vehicle Miles per Year	160,264	Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)
Future Air Quality Benefits		
Reduced PM10 (tons/weekday)	11	Daily mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/weekday)	306	Daily mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/weekday)	45	Daily mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced PM10 (tons/year)	2,949	Yearly mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/year)	79,939	Yearly mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/year)	11,635	Yearly mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced CO2 (tons/year)	136,224	Yearly mileage reduction multiplied by 0.85 pounds per reduced mile

Table 4.2. Air Quality Benefits from Bicycling

Variable	Figure	Source
Study area population	7,183	2000 Census, STF3, P1.
Employed population	3,302	2000 Census, STF3, P30.
Bike-to-work mode share	1.2%	2000 Census, STF3, P30.
Number of bike-to-work commuters	40	Employed persons multiplied by walk-to-work mode share
Work-at-home mode share	9.6%	2000 Census, STF3, P30.
Number of work-at-home bike commuters	158	Assumes 50% of population working at home makes at least one daily bicycle trip
School children, ages 6-14 (grades K-8)	863	2000 Census, STF3, P8.
School children bicycling mode share	2.0%	National Safe Routes to School surveys, 2003.
School children bike commuters	17	School children population multiplied by school children bike mode share
Total number of bike commuters	215	Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.
Total daily bicycling trips	431	Total bicycle commuters x 2 (for round trips)
Existing Vehicle Trips and Miles Reduction		
Reduced Vehicle Trips per Weekday	154	Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	40,135	Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)
Reduced Vehicle Miles per Weekday	1,166	Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren
Reduced Vehicle Miles per Year	304,370	Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)
Existing Air Quality Benefits		
Reduced PM10 (tons/weekday)	21	Daily mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/weekday)	582	Daily mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/weekday)	85	Daily mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced PM10 (tons/year)	5,600	Yearly mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/year)	151,820	Yearly mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/year)	22,097	Yearly mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced CO2 (tons/year)	258,715	Yearly mileage reduction multiplied by 0.85 pounds per reduced mile
Future Commuting Statistics		
Future study area population	10,041	Estimate this number based on historic population growth (or decline) trends
Future employed population	4,616	Estimate this number based on historic employment growth (or decline) trends
Future bike-to-work mode share	2.4%	Assumed doubling based on more complete network and results from ATAC Bicycling and Walking Survey, 2008 improvements.
Future number of bike-to-work commuters	111	Employed persons multiplied by bike-to-work mode share
Future work-at-home mode share	9.6%	Estimate this number based on historic work-at-home population growth (or decline) trends

Variable	Figure	Source
Future number of work-at-home bike commuters	222	Assumes 50% of population working at home makes at least one daily bicycle trip. Change the formula in this cell if the percentage is expected to increase or decrease
Future school children, ages 6-14 (grades K-8)	1,206	Estimate this number based on historic population growth (or decline) trends
Future school children bicycling mode share	3.0%	Assumed doubling based based on more complete network and results from ATAC Bicycling and Walking Survey, 2008.
Future school children bike commuters	36	School children population multiplied by school children bicycling mode share
Future total number of bicycle commuters	369	Total bike-to-work, school, college and utilitarian walking trips. Does not include recreation.
Future total daily bicycling trips	737	Total walk commuters x 2 (for round trips)
Future Vehicle Trips and Miles Reduction		
Reduced Vehicle Trips per Weekday	262	Assumes 73% of walking trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	68,328	Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)
Reduced Vehicle Miles per Weekday	1,960	Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren
Reduced Vehicle Miles per Year	511,589	Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)
Future Air Quality Benefits		
Reduced PM10 (tons/weekday)	36	Daily mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/weekday)	978	Daily mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/weekday)	142	Daily mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced PM10 (tons/year)	9,413	Yearly mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/year)	255,181	Yearly mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/year)	37,141	Yearly mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced CO2 (tons/year)	434,851	Yearly mileage reduction multiplied by 0.85 pounds per reduced mile

4.4. CRASH AND SAFETY ANALYSIS

Pedestrian- and bicycle-related crash data from 2002 through 2007 was collected and analyzed. While the small number of incidents and a variety of other potential factors make it difficult to draw conclusions from this data, there are no significant spikes in the data. Compared to other communities in California, based on the combined number of incidents involving bicyclists or pedestrians Mount Shasta's rate 0.55 incidents per 1,000 persons is slightly lower than the average of 0.67 incidents per 1,000 persons.

There were seven crashes involving pedestrians and motor vehicles in Mount Shasta reported during the study years: one in 2003 and two each in 2005, 2006, and 2007. No crashes involving pedestrians

were reported in 2004. The majority of these occurred during the work-week, with only one occurring on a Sunday. Six of the seven crashes were listed as “crossing in crosswalk at intersection.”

Four of the seven reported crashes occurred along Mount Shasta Boulevard. This frequency can be partially attributed to the higher concentrations of foot traffic along the corridor.

A total of six crashes involving bicyclists and motor vehicles occurred between 2002 and 2007; one in 2002, two each in 2004 and 2006, and one in 2007. No crashes involving bicyclists were reported in 2003 or 2005. Crashes involving bicyclists occurred in many of the same locations as those involving pedestrians. The majority of cyclist crashes occurred during the work week, with only one occurring on a Saturday.

Crashes involving bicyclists in Mount Shasta occurred at:

- South Mount Shasta Boulevard and Sheldon Avenue
- Mount Shasta Boulevard and Alma Street
- North/South Mount Shasta Boulevard at McCloud Avenue
- Maple Street at West Lake Street
- Lake Street at Mount Shasta Boulevard
- North Mount Shasta Boulevard at McCloud

Notably, with the exception of one pedestrian incident north of the city at Nixon Road and the Union Pacific Railroad, all crashes involving pedestrians and bicyclists occurred in downtown Mount Shasta. These lists also indicate that a majority of incidents occurred in the major north-south corridor (Mount Shasta Boulevard).

The recommended pedestrian and bikeway system will address these problem areas, and those identified through the field review and public input, by identifying specific countermeasures to reduce crashes, including one or more of the following: physical improvements, identification of alternative routes, and introduction of safety education programs.

4.5. IDENTIFIED NEEDS

4.5.1. *Summary of Walking and biking in Mount Shasta*

In 2007, the Mount Shasta Alternative Transportation Advisory Committee conducted a survey of non-motorized transportation in Mount Shasta to obtain data on general usage trends, as well as barriers to cycling and walking. The majority of the findings are summarized in Section 4.1 of this plan. Additionally, respondents were asked to identify intersections they felt were difficult for walking or bicycling. Table 4.4 shows intersections that were identified as obstacles to either bicycling or walking, and the number of times each one was mentioned.

Table 4.4. Intersections Considered Obstacle to Walking and/or Bicycling

Intersection	Walking Obstacle	Bicycling Obstacle	Walking/Biking Not Stated	Rank
Chestnut-McCloud-MS Blvd-Alpine-Berryvale	26	25	49	100
Pine & Lake	7	6	28	41
Ream & MS Blvd	7	9	13	29
Lake & MS Blvd	4	5	15	24
Chestnut & Lake	3	5	10	18
Alma & MS Blvd & RRX	2	2	10	14
Alma & Chestnut	3	2	7	12
Washington & McCloud	2	2	8	12
Commercial & Lake	0	1	9	10
Chestnut & No. MS Blvd	3	4	2	9
Maple & Lake	1	2	6	9
Sheldon & MS Blvd	1	1	4	6
Morgan & Lake	1	1	4	6
Rockfellow & Alma (Sisson School)	2	2	1	5
Castle & MS Blvd	1	0	4	5
Old McCloud & MS Blvd	1	1	2	4
Alma & Pine	0	1	3	4
Washington & Old McCloud	1	1	1	3
Rockfellow & Everitt Memorial	1	1	1	3
Hinckley & MS Blvd	0	0	3	3
Cedar & Alma	0	0	3	3
Nixon & MS Blvd (City Park Entrance)	0	1	1	2
Washington & Lake	0	0	2	2
Spring Hill & No. MS Blvd & I-5	0	0	2	2
Azalea & Hwy 89	0	1	0	1
Ream & Old Stage	0	0	1	1
Smith & MS Blvd	0	0	1	1
Old Stage & WA Barr	0	0	1	1
RRX on No. MS Blvd	0	0	1	1
Abrams & Old Stage Rd	0	0	1	1
Maple & Castle (Sam's Corner)	0	0	1	1
MS Blvd & Hwy 89	0	0	1	1
Hatchery Lane & Old Stage Rd	0	0	1	1
Ivy & MS Blvd	0	0	1	1
Background				
The question asked respondents to list the 3 worst intersections, stretches of road or other obstacles that need improvement.				
This spreadsheet lists all intersections identified in the answers to this question.				
We asked the respondents to identify these obstacles as either biking or walking related.				
Some respondents did not categorize obstacles as walking or biking related.				
These uncategorized responses are listed in the "Walking/Biking Not Stated" column.				
The Rank column is the total of the "Walking Obstacle", "Bicycling Obstacle" and "Walking/Biking Not Stated" columns.				

Table 4.5 shows the results when the same question was asked for roadway corridors that present a barrier to bicycle or pedestrian travel.

- Nearly one third of students surveyed reported that one or more adults living in their household biked regularly.
- Over half of students surveyed reported that their parents lived within 5 miles of work.
- Nearly 80 percent of students surveyed reported that one or more children living in their household walked regularly.
- Respondents were asked to identify up to three intersections and roadway corridors considered obstacles to bicycling and walking. The results are included in Tables 4.6 and 4.7. These included:

Table 4.6. Intersections Considered Obstacle to Walking and/or Bicycling (High School)

Intersection	Walking Obstacle	Bicycling Obstacle	Walking/Biking Not Stated	Rank
Pine & Lake	2	1	13	16
Ream & MS Blvd	0	2	9	11
Chestnut-McCloud-MS Blvd-Alpine-Berryvale	0	1	8	9
Alma & MS Blvd & RRX	0	0	7	7
Chestnut & Lake	0	0	6	6
Washington & McCloud	0	0	6	6
Morgan & Lake	1	0	5	6
Maple & Lake	1	0	4	5
Castle & MS Blvd	1	0	4	5
Lake & MS Blvd	0	0	4	4
Chestnut & No. MS Blvd	0	0	3	3
Hatchery Lane & Old Stage	0	0	3	3
Alma & Chestnut	0	0	2	2
Springhill & MS Blvd	0	0	2	2
Castle & Chestnut	0	0	2	2
Ivy & MS Blvd	0	0	2	2
Hinckley & MS Blvd	0	0	2	2
Old McCloud & MS Blvd	0	0	1	1
Alma & Pine	0	0	1	1
Rockfellow & Everitt Memorial	0	0	1	1
Abrams Lake & Old Stage	0	0	1	1
Cedar & Alma	0	0	1	1
Azalea & Hwy 89	0	0	1	1
Background				
The question asked respondents to list the 3 worst intersections, stretches of road or other obstacles that need improvement.				
This spreadsheet lists all intersections identified in the answers to this question.				
We asked the respondents to identify these obstacles as either biking or walking related.				
Some respondents did not categorize obstacles as walking or biking related.				
These uncategorized responses are listed in the "Walking/Biking Not Stated" column.				
The Rank column is the total of the "Walking Obstacle", "Bicycling Obstacle" and "Walking/Biking Not Stated" columns.				

Table 4.7. Roadway Corridors Considered Obstacles to Walking and/or Bicycling (High School Survey)

Stretch of Road	Walking Obstacle	Bicycling Obstacle	Walking/Biking Not Stated	Rank
No. MS Blvd - Downtown to City Park	1	4	6	11
Washington	0	1	7	8
McCloud Ave	2	1	4	7
Old Stage Rd	0	1	4	5
So. MS Blvd - Downtown to Piemont	0	0	5	5
MS Blvd - Downtown Area	0	0	5	5
No. MS Blvd - City Park to Spring Hill	0	0	4	4
So. MS Blvd - so. Of Piemont	0	0	4	4
W. Lake St	0	0	3	3
Alma - between schools	0	0	3	3
E. Lake St	0	0	2	2
Shastice Park Rd	0	0	2	2
Everitt Memorial Hwy	0	0	2	2
E. Castle - one way portion	0	0	1	1
Lake Siskiyou Trails	0	0	1	1
Sugar Pine	0	0	1	1
I-5 Overpass @ Lassen Lane	0	1	0	1
City Park Rd	0	0	1	1
Hwy 89	0	0	1	1
Rockfellow	0	0	1	1
Background				
The question asked respondents to list the 3 worst intersections, stretches of road or other obstacles that need improvement.				
This spreadsheet lists all stretches of road identified in the answers to this question.				
We asked the respondents to identify these obstacles as either biking or walking related.				
Some respondents did not categorize obstacles as walking or biking related.				
These uncategorized responses are listed in the "Walking/Biking Not Stated" column.				
The Rank column is the total of the "Walking Obstacle", "Bicycling Obstacle" and "Walking/Biking Not Stated" columns.				

- Nearly one half of students surveyed reported that one or more children living in their household biked regularly, though only 14 percent rode to school at least once a week.
- Parents cited the following items as major barriers to increased cycling and walking for their child:
 - Convenience/comfort of a car
 - Destination too far, or travel takes too long
 - Bad weather
- Other barriers felt to have a more moderate impact included:
 - Lack of bikeways
 - Lack of sidewalks
 - Afraid of cars/drivers

- Difficult intersection
- Personal security

4.6. SUMMARY OF CONSTRAINTS AND OPPORTUNITY AREAS

Through a combination of field visits, public input and review of pertinent documents, the following list of key opportunities and constraints has been identified.

Opportunities

- **Union Pacific Railroad Corridor.** This corridor extends through town and could potentially be used to create a north-south shared-use trail, which would serve as the spine of a non-motorized transportation system. The rail line is a main north-south corridor for the UPRR and is expected to remain so. However, in some areas the railroad right of way may be wide enough to accommodate both a trail and rail operations. South of the city, the I-5 UPRR overhead provides a potential crossing of I-5 by a trail in the railroad corridor. This would require significant retaining walls and would therefore likely be a costly project, but probably still less expensive than a separate trail structure over or under the freeway. At the north end of the city the existing UPRR bridge abutment near Mount Shasta City Park, apparently built for future double-tracking, could serve as the foundation for another bicycle and pedestrian crossing of I-5. The City would have to work with the UPRR to investigate its availability for non-rail use.
- **Mercy Medical Center.** The hospital sits adjacent to a narrow section of the rail corridor and could provide an excellent alternative route to a trail through the corridor itself. However, this would require acquisition of private land or an easement from the hospital. A trail from City Park to downtown could potentially incorporate and/or connect to the existing Napenthe Trail.
- **Perception of Mount Shasta as a destination location with readily accessible, existing cycling opportunities.** Mount Shasta already has a reputation as a bicycling destination for on and off road bicycling. Mount Shasta has the opportunity to enhance this reputation through the construction of bicycle facilities, which may translate into increased tourism to the area.
- **Unused city right-of-way.** There is a significant amount of unused, undeveloped right-of-way within the city (e.g., north of the existing Birch Street and Spruce Street roadways). Currently, the city does not maintain a comprehensive listing of unused, undeveloped right-of-way.
- **McCloud Rail Road.** This existing east/west running railway road could serve as a key non-motorized transportation corridor in the future. The City has agreed to support development of this facility if the corridor is ever abandoned.
- **Generous right-of-way along many existing streets.** Many streets in the downtown area, (e.g. Lake, Castle, Mount Shasta Boulevard) have ample room in the existing right-of-way to add bicycle and pedestrian facilities where they don't already exist.

- **Policies that support and encourage increased cycling and walking.** Policies in the General Plan and the Community Action Plan already support maintaining and increasing the attractiveness of cycling and walking as sustainable and healthy choices for transportation and recreation.
- **Connections to existing mountain bike trails.** Existing mountain bike trails are accessed off Everitt Memorial Highway. As the Everitt Memorial Highway/Washington Drive corridor already serves a significant number of cyclists it should be considered for designation as a key north/south bikeway.
- **Non-interchange Crossings of I-5.** While I-5 presents a significant barrier to east-west travel, non-interchange crossings at Pine Street/Lassen Lane and West Ream Avenue provide lower traffic alternatives to the Lake Street interchange.
- **Grid of Street.** Mount Shasta has a relatively complete grid of streets that provides opportunities for bicycle and pedestrian travel on less-traveled routes parallel to some of the busier roads.
- **Proximity of Schools and Parks.** All four public schools, Shastice Park, the public library and Sisson Meadow are within one mile of each other. In conjunction with sections of Everitt Memorial Highway and Rockfellow Drive, Alma Street could serve as a non-motorized corridor serving all of these destinations.
- **Access to major employment centers.** Many major employers, included the Forest Service, Mercy Medical Center and others can be connected through pedestrian and bicycle facilities.
- **Opportunities to improve intersections and road corridors identified through public outreach.** Frequently mentioned intersections and road corridors mentioned as obstacles to bicycle or pedestrian travel will serve as a key source for recommended network improvements.
- **Spring Hill Road.** Additional ROW could be converted to a Class I (multi-use) trail. The general plan supports a long term plan for bicycle facilities on Spring Hill drive. Sufficient width exists to strip bike lanes (Class II) or create a shared-use (Class I) trail. Recommendations contained in Chapter 7 currently recommend a Class II facility. Additional feasibility study is required to determine the most appropriate and desirable long term solution for this corridor.
- **Connections to existing trails.** Connections to existing trail heads, including Lake Siskiyou Trail and Box Canyon Trail may increase the number of recreational users as well as help improve conditions throughout the overall system.

Constraints

- **Union Pacific Railroad Corridor.** This corridor extends through the city from south to north, creating a barrier to east-west travel within the city.
- **McCloud Rail Road Corridor.** This corridor extends across the northern part of the city from west to east, creating a barrier to non-motorized travel to the north.

- **Interstate 5.** While I-5 serves as a de-facto western boundary to the city, it creates conditions that impair east/west network connectivity through Mount Shasta. Though the area adjacent to and particularly to the west of I-5 is relatively undeveloped, there are already major destinations for recreation and tourism to the west of the freeway. Furthermore, connectivity issues will likely increase over time as land use density within the city boundary increases.
- **Mercy Medical Center.** The hospital sits adjacent to a narrow section of the rail corridor and could provide an excellent alternative route to a trail through the corridor itself. However, this would require acquisition of private land or an easement from the hospital.
- **Snow Clearance.** Many residents cited accumulation of plowed snow on sidewalks as a key deterrent to walking during winter months.
- **Limited Network Connectivity.** Although a well connected street grid exists in downtown and the surrounding neighborhoods, discontinuous streets in other areas impede direct travel between some areas. Specifically, circuitous streets characterize neighborhoods in the southern and eastern part of the city.
- **Diagonal head-in parking.** Head-in motor vehicle parking creates conflict points for cyclists. Along streets with head in parking (e.g. Chestnut Street and Castle Street) parked cars may limit visibility for drivers backing out, decreasing the chance of a driver seeing an oncoming cyclist. These conditions require cyclists to ride close to the center of the lane to avoid potential collisions, which may cause discomfort for less experienced riders.
- **Limited transit service for bicycle riders.** At this time, transit service only carries bicycles during daylight savings time. This may limit use of transit or lead to a perception of unreliability of service throughout the year.
- **Lack of existing wayfinding tools and signage.** Mount Shasta’s bicycle and pedestrian system would benefit from signage and other wayfinding tools to orient users and direct them to and through major destinations like downtown, schools (e.g. Mount Shasta High School and Sisson School, community locations such as the library, connections to recreational trails (e.g. Sisson Meadows) and various surrounding neighborhoods.
- **Incomplete sidewalk network.** Mount Shasta has sidewalks of varying width and condition throughout the city. In some areas the network terminates mid-block. A relatively complete system exists within the downtown area. Irregular conditions dominate other portions of the city.

4.6.1. *Difficult Crossings/Intersections Recommended for Improvement*

The following intersections are recommended for consideration of safety improvements. A brief summary of challenging conditions is included with each intersection.

- South Mount Shasta Boulevard at Sheldon Avenue
 - Higher speed traffic, heavy motor vehicle traffic, poor sight distance, irregular intersection geometry compounded by proximity to Ream Avenue intersection
 - Crash location involving bicycle or pedestrian

- North/South Mount Shasta Boulevard at McCloud Avenue
 - Frequent turning movements, irregular intersection geometry, heavy pedestrian demand
 - Crash location involving bicycle or pedestrian
- Maple Street at West Lake Street
 - Higher speed traffic, higher traffic volumes on West Lake Street, wide roadway
 - Crash location involving bicycle or pedestrian
- Chestnut at Ivy Street/Jessie Street
 - Lack of sidewalks and crosswalks
 - Pedestrian crash location
- Orem Street at Chestnut Street
 - Irregular intersection geometry, higher speed roads, higher volume roads
 - Crash location involving bicycle or pedestrian
- East Lake Street at Washington Drive
 - Wide, skewed intersection creates a long travel time for cyclists and pedestrians
 - No traffic controls on East Lake Street
 - No marked crosswalks
- West Lake Street Bridge Overcrossing of I-5
 - No approach sidewalks
 - Sidewalk on overcrossing is blocked by guard rail at east end
- North Mount Shasta Boulevard at McCloud River Railroad crossing
 - Highly skewed crossing hazardous for bicyclists
- Ivy Street at Kenneth Way
 - Steep hill on approach causes cars to come through this intersection at high speeds
 - Sharp bend in road at this intersection limits visibility
 - Proximity to retirement home increases the chance that pedestrians crossing at this intersection will cross slowly due to age or mobility impairments
- North Mount Shasta Boulevard and Chestnut Street
 - Irregular intersection geometry, higher speed roads, higher volume roads
- Ream Avenue and South Mount Shasta Boulevard
 - Irregular intersection geometry, higher speed roads, higher volume roads, proximity to Sheldon Avenue intersection
 - Lack of pedestrian crossing

- Ream Avenue at Union Pacific Railroad crossing
 - Narrow pavement and lack of sidewalks or shoulders
- North Mount Shasta Boulevard and Spring Hill Drive
 - Irregular intersection geometry, higher speed roads, limited sight distance, excessive intersection size
- South Mount Shasta Boulevard at Ida Street
 - Higher speed roads, higher volume roads
 - Crash location involving bicycle or pedestrian

4.7. LIABILITY

Hundreds of jurisdictions throughout the United States annually build and maintain on and off-road bicycle and pedestrian facilities. While most of these jurisdictions do not encounter significant liability issues, it is still an important consideration.

Increasingly, planners, designers, engineers and other city officials must consider the potential liability for installation of bike lanes and other transportation facilities. Generally, cases where cyclists or pedestrians are involved are filed under ‘tort liability’, generally negligence. ‘Tort’ is defined simply as a “‘civil wrong’ rather than a criminal act, committed against another person.”¹⁰ A negligent act is comprised of three elements, an act or failure to act, a duty of care and a breach of that duty.

Planners, engineers and designers must consider the needs of all users during design, construction and maintenance of a facility. But, installation and provision of these facilities does not mean that the party with responsibility for the roads or trails is responsible for all or any crashes that occur on these facilities.

- Bicyclists and facility users have a responsibility to use facilities in a ‘reasonable manner.’ Negligence on the user’s part may include inattention, alcohol use, user handling error (e.g., lapse of judgment), or failure to follow rules of the road.

It is important to remember that liability goes both ways and the city could be sued for not installing appropriate bikeways where the public has requested them and safety issues have been documented.

Bike lanes, like roadways, have specific maintenance procedures and standards, which for bike lanes should be spelled out in the bike plan. Public agencies must also have a system where people can report problems and have them addressed. However, a public agency is not responsible for

¹⁰ Monske, Bob *Bicycling and the Law: Your Rights as a Cyclist*. Velo Press: Boulder CA. p 120.

maintenance problems caused by a lack of funding. The public is responsible for the amount of funding they approve or do not approve.

The Federal Highway Association (FHWA) offers the following suggestions for addressing liability concerns:

- Consider all facility users.
- Consider that governments can be sued for what they do not do.
- Take action promptly in response to identified hazards.
- Past cases that have led to quick settlements include:
 - Open drainage grates in the travelway
 - Paths that end abruptly at locations that provide no viable transition
 - Inadequate curve radii
 - Long-term, severe surface irregularities
 - Poor sight distances
 - Roadway design, planning, operation, and maintenance that do not consider bicycle and pedestrian use.
 - Bridges and underpasses that are hazardous to bicycles and pedestrians
 - Poor maintenance of off-street facilities
- More information on questions of liability is available in AASHTO's *Guide for Achieving Flexibility in Highway Design*, and the Federal Highway Administration's "Lesson 8 Liability and Risk Management" from the Course on Bicycle and Pedestrian Transportation available online at http://safety.fhwa.dot.gov/PED_BIKE/univcourse/swtoc.htm.

CHAPTER 5. Proposed System & Improvements

The proposed non-motorized transportation system is divided into bicycle and pedestrian components. Both systems are discussed in terms of facilities and programs. The physical systems are discussed individually in the first part of the chapter followed by a combined discussion of education, encouragement and enforcement programs. While the physical bikeway system is discussed in terms of a citywide network and end of trip facilities, the physical pedestrian system is discussed in terms of improvements along several ‘pedestrian priority’ corridors. This approach is based on two considerations: first, that a number of streets in Mount Shasta already offer some level of pedestrian service (e.g., sidewalks and crosswalks), and second, that a comprehensive sidewalk inventory and improvement strategy is beyond the scope of this Plan.

5.1. VISION

As described in the 2002 Mount Shasta Community Action Plan, (CAP) the long term vision for Mount Shasta is “to maintain the character and resources of our ‘small town’ community while striking an appropriate balance between economic development and quality of life.” The vision of the Community Action Plan is reflected in the 2007 Mount Shasta General Plan. Meeting the transportation needs of current and future users in a balanced and equitable manner is integral to a continuing high quality of life. Creating outstanding bicycle and pedestrian facilities is a long term, continuing goal which resonates with both of the previously mentioned Plans.

The long term vision of this Plan includes the construction of bikeways and walkways suitable for all users, connecting to commercial, residential, recreational and educational destinations. The short-term vision for bicycling includes completing and improving existing bicycle routes and lanes, signing and stenciling proposed routes, installing parking and implementing programs to support and enhance bicycling in Mount Shasta. For pedestrians, the short-term vision is to maintain and improve existing walkways and crosswalks. For both groups creating a network of low traffic alternative routes will help to create safe access to schools, provide attractive travel routes to access neighborhoods and prioritize safety for all users. Detailed priorities for implementation are listed in Chapter 7.

5.2. PROPOSED BICYCLE AND PEDESTRIAN IMPROVEMENTS

This section provides information about the proposed improvements for bicycling and walking in the City of Mount Shasta including both physical improvements (bike paths, lanes, routes, bike parking, walkways, crossing improvements) and education, enforcement and encouragement programs (e.g., Safe Routes to Schools). As shown in the preceding Existing Conditions chapter

(Chapter 3), Mount Shasta’s current walkway and bikeway system provides opportunities for non-motorized travel through a network of sidewalks and on-street Class III bicycle routes.

However, significant gaps remain in the bikeway system that are critical to providing good connectivity for cyclists riding both within Mount Shasta and attempting to travel to neighboring communities. The connections from residential areas north of Rockfellow Drive and south of Old McCloud Road to downtown still present significant obstacles to cyclists. Improvements in pedestrian circulation are also needed to increase access from neighborhood areas to downtown and schools as well as to encourage safe walking throughout the city.

Table 5.1 - Summary of Proposed Bikeways

Mount Shasta Proposed Bicycle Facilities - 2008		
Class	Bikeway Type	Total Mileage
I	Multi-Use Path	8.4 or 9.2
II	Striped Bicycle Lanes	10
III	Signed Bicycle Routes	4.6
	All Bikeways	23 or 23.8

5.3. BICYCLE FACILITY IMPROVEMENTS

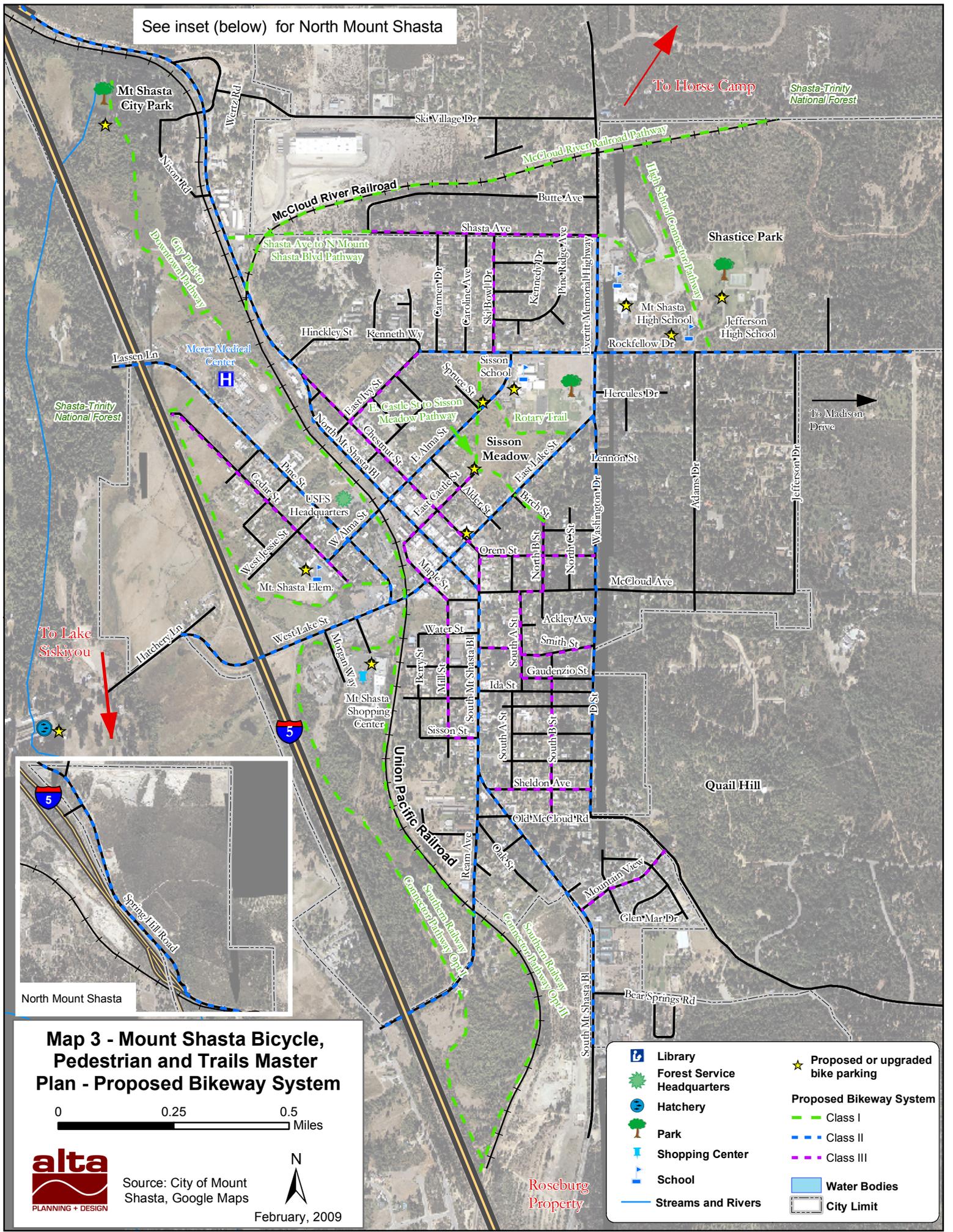
5.3.1. *Laying Out a Bicycle System*

The primary method for selecting a bikeway system for Mount Shasta was to receive input from the local bicycling community and local staff familiar with the best routes and existing constraints and opportunities and augmented by field review. Input can be received through a variety of means – in Mount Shasta it was received through a public workshop in December 2007, a survey conducted by the ATAC in the spring and summer of 2007, and through consultation with city staff and the ATAC.

The following criteria were used to develop the Mount Shasta bicycle system:

- Existing bicycling patterns
- Traffic volumes and travel speeds
- Curb-to-curb width
- Access from residential areas

See inset (below) for North Mount Shasta



Map 3 - Mount Shasta Bicycle, Pedestrian and Trails Master Plan - Proposed Bikeway System

0 0.25 0.5 Miles



Source: City of Mount Shasta, Google Maps



February, 2009

- Library
- Forest Service Headquarters
- Hatchery
- Park
- Shopping Center
- School
- Streams and Rivers
- Proposed or upgraded bike parking
- Proposed Bikeway System**
 - Class I
 - Class II
 - Class III
 - Water Bodies
 - City Limit

Roseburg Property

- On-street parking
- Accident data and safety concerns
- Existing bottlenecks or constraints
- Existing opportunities such as planned roadway improvements
- Number of destinations served
 - Schools
 - Parks
 - Employment centers
 - Adjacent land use

The proposed Mount Shasta bikeway system, shown on Map 3, was developed by addressing routes already used by bicyclists and focusing on specific opportunities and constraints. The backbone of the network is focused around the idea of a Class I north-south connection along the existing Union Pacific Railroad (UPRR) with Class II and Class III facilities providing opportunities for access to nearby residential and commercial areas via lower traffic, shared streets.

5.3.2. *Selecting a Bicycle Facility*

The choice of on-street bike facilities for a particular road—bike lanes (Class II), bike route (Class III) or shared roadways—can be a simple quantitative matter of the speed and volume of traffic on the roadway, or a matter of roadway classification. It can also be based on a much more complicated analysis that includes consideration of facility users, key connections, type of traffic, and other qualitative factors.

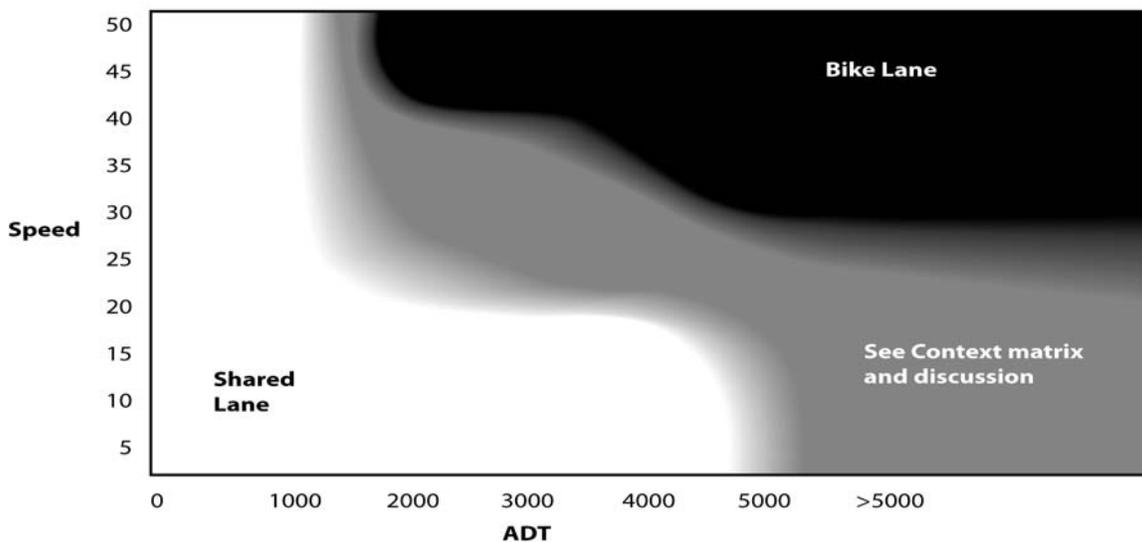
Support for a more nuanced approach to facility choice comes from the 1999 AASHTO Guide for the Development of Bicycle Facilities. The AASHTO guide recommends consideration of additional characteristics including:

- Skill level of users
- Motor vehicle parking
- Barriers
- Crash reduction
- Directness
- Accessibility
- Aesthetics
- Personal safety and security
- Stops

- Maintenance requirements
- Pavement quality
- Truck and bus traffic
- Traffic volumes and speeds
- Bridges
- Intersection Conditions
- Costs/Funding
- State and Local Laws and Ordinances

While for the most part bike lanes are needed on busy, high-speed urban and suburban thoroughfares, and shared roadways are appropriate for low-speed, low-volume streets, many newer plans, such as the update to the *Oregon Bicycle and Pedestrian Plan* take a more nuanced approach. While there are quantitative data showing speed and volume levels where shared facilities no longer function adequately there are additional qualitative considerations that planners can apply below these functional levels to increase the comfort of on-road bicycle facilities for all ages and skill levels. Figure 5.1 shows the considerable grey-area in facility determination proposed in the *Oregon Bicycle and Pedestrian Plan*.

Figure 5.1 – Bike Facility Chart¹



This figure shows that even on roads with low traffic volume and speed levels, consideration of other factors such as block length or proximity to schools or parks may indicate benefits from adding bike lanes.

¹ Source: *Oregon Bicycle and Pedestrian Plan, 2008 Draft Update*

Table 5.2 - Context Matrix

Variable	Effect on Need for Bike Lanes
1. Land Use indicators	
Urban Center, CBD	Decreases
Suburban	Increases
Buildings at back of sidewalk	Decreases
Buildings set back from roadway (parking lots front street)	Increases
On Street Parking	Decreases
Short block length	Decreases
Long block length	Increases
2. Traffic speed/volume indicators	
Signal coordination timed at higher than posted speeds	Increases
Signal coordination timed at lower than posted speeds	Decreases
Peak Hourly Traffic Volume greater than 10%	Increases
3. Roadway characteristics	
Wide roadway / multiple travel lanes	Increases
Steep grades: uphill	Increases
Steep grades: downhill	Decreases
4. Bicycling demand indicators	
Popular Route to School	Increases
Provides continuity of bike lanes, routing or trail	Increases
Other high-use indicators	Increases

Source: *Oregon Bicycle and Pedestrian Plan, 2008 Draft Update*

In Mount Shasta some routes with proposed Class II facilities do not meet minimum recommended Average Daily Traffic (ADT) and speed thresholds for bike lanes. These routes have been recommended for designation as Class II facilities based on qualitative characteristics listed above (e.g., East and West Alma Street provide linkages to two schools).

5.3.3. Proposed Class I

As noted in the Existing Conditions, Mount Shasta’s current bikeway system is composed entirely of Class III bicycle routes and undesignated shared roadways. The current update proposes several new Class I facilities (Table 5.3). The City has begun preliminary planning of several facilities (e.g., City Park to Downtown Trail and the Sisson Meadows Trail) while other facilities (e.g., the McCloud River Railroad Trail) remain long-term potential projects.

- City Park to Downtown Pathway:** This route would connect City Park to the downtown area along a north/south alignment roughly following the UPRR corridor, crossing Alma Street near the USFS office and continuing along the UPRR corridor (Southern Railway Connector). A trail feasibility study would determine the preferred alignment for the trail, either within or outside of the UPRR right-of-way. This project has outstanding access/easement issues and may require significant wetland mitigation. This path could

extend north and use the existing UPRR bridge abutments as the base for a bicycle/pedestrian bridge. Usage of these abutments would require collaboration with UPRR. This facility can connect to the larger Siskiyou County trail network as recommended in the Community Action Plan.

An unofficial at grade crossing at Ivy Street could be formalized to create a new at-grade railroad crossing, though the railroad and the California Public Utility Commission are generally opposed to new at-grade crossings. A trail feasibility study should consider this possibility.

- **Southern Railway Connector Pathway:** This route would connect to the City Park to Downtown Trail through the undeveloped property west of the UPRR corridor and east of I-5, cross Ream Avenue and continue south to an undetermined terminus south of the city limits. Two potential routes are shown in Map 3. Option I runs south through undeveloped property west of the UPRR while Option II more closely follows the UPRR alignment. An opportunity exists to utilize the existing UPRR undercrossing of I-5. This trail may follow the east or west side of the existing tracks, but in either case would likely require significant retaining walls. This facility can connect to the larger Siskiyou County trail network as recommended in the Community Action Plan. A feasibility study would determine the preferred alignment for the trail, either within or outside of the UPRR right-of-way.
- **Rotary Trail** This facility would provide connectivity between East Lake Street and East Alma Street, providing bicycle access to Sisson School, Mount Shasta Library, and the pedestrian boardwalks of the Sisson Meadow Natural Area.
- **North B Street/Birch Street Connector:** This facility would provide a short Class I link between proposed Class III facilities on Birch Street and North B Street.
- **Cedar Street to Lassen Lane Connector:** This facility would provide connectivity along the east side of I-5 between the north end of Cedar Street and Lassen Lane near the Mercy Medical Center.
- **McCloud River Railroad Pathway:** This facility would extend east/west along the existing McCloud River Railroad alignment. This alignment is only partially within the city limits; development would most likely require coordination with the County. The City has proposed to support development of this facility in the event the alignment is ever abandoned. However, it may be feasible to build a rail-with-trail while the line is still operational. This facility can connect to the larger Siskiyou County trail network as recommended in the Community Action Plan.
- **Shasta Avenue to North Mount Shasta Boulevard Pathway:** This facility would provided a convenient connection in the northern part of the city.
- **High School Connector Pathway:** This facility would extend from Rockfellow Drive north to the McCloud Railroad Trail and provide off-street access to Shastice Park, Jefferson High School and Mount Shasta High School. Development of a new park entrance would create an opportunity to utilize the existing entrance as part of this pathway. This would include a connection to Shasta Avenue.

- **East Castle Alley Pathway:** This facility would follow the existing East Castle Alley from West Alma Street at Sisson Meadows to the east end of the existing improved portion of East Castle Street where the Class III designation would begin.
- **East Castle Street to East Birch Street:** This facility would extend through the Sisson Meadows Natural Area and provide connectivity between East Castle Street and East Lake Street at Birch.
- **Spruce Street Connector - East Alma Street to Rockfellow Drive:** This short Class I connector segment will provide off-street connectivity as part of a north-south non-motorized travel corridor using an existing city right-of-way. Specifically, it will connect the East Castle to Sisson Meadow Connector pathway to Rockfellow Drive near Ski Bowl Drive.

Table 5.3. Proposed Class I Facilities

Class I Facilities – Shared Use Paths (Off-Street)			
Segment Name	Start	End	Length (mi)
City Park to Downtown Pathway	City Park	West Alma Street	1.9
Southern Railway Connector Pathway (Option I)	West Alma Street	city limits	1.6
Southern Railway Connector Pathway (Option II)	West Alma Street	city limits	2.4
Rotary Trail	East Alma Street	East Lake Street	0.2
McCloud River Railroad Pathway	Union Pacific Railroad	city limits	1.3
Shasta Avenue to North Mount Shasta Boulevard Pathway	Shasta Avenue	North Mount Shasta Boulevard	0.3
High School Connector Pathway	Rockfellow Drive	McCloud Railroad	0.5
East Castle Street to Sisson Meadow Connector Pathway	East Alma Street	City Park to Downtown Pathway	0.1
East Castle Street to East Birch Street Pathway	East Castle Street	East Birch Street	0.1
Spruce Street Connector	East Alma Street	Rockfellow Drive	0.1
North B Street/ Birch Street Connector	Birch Street	North B Street	Less than .1
Cedar Street to Lassen Lane Connector	Cedar Street	Lassen Lane	2.2
		Total Option I - 8.4	
		Total Option II – 9.2	

5.3.4. Proposed Class II

Proposed (Class II) bicycle lanes in Mount Shasta are intended to create a primary network of on-street bicycle facilities. A secondary network of Class III facilities will help fill system gaps and highlight travel alternatives via lower traffic streets.

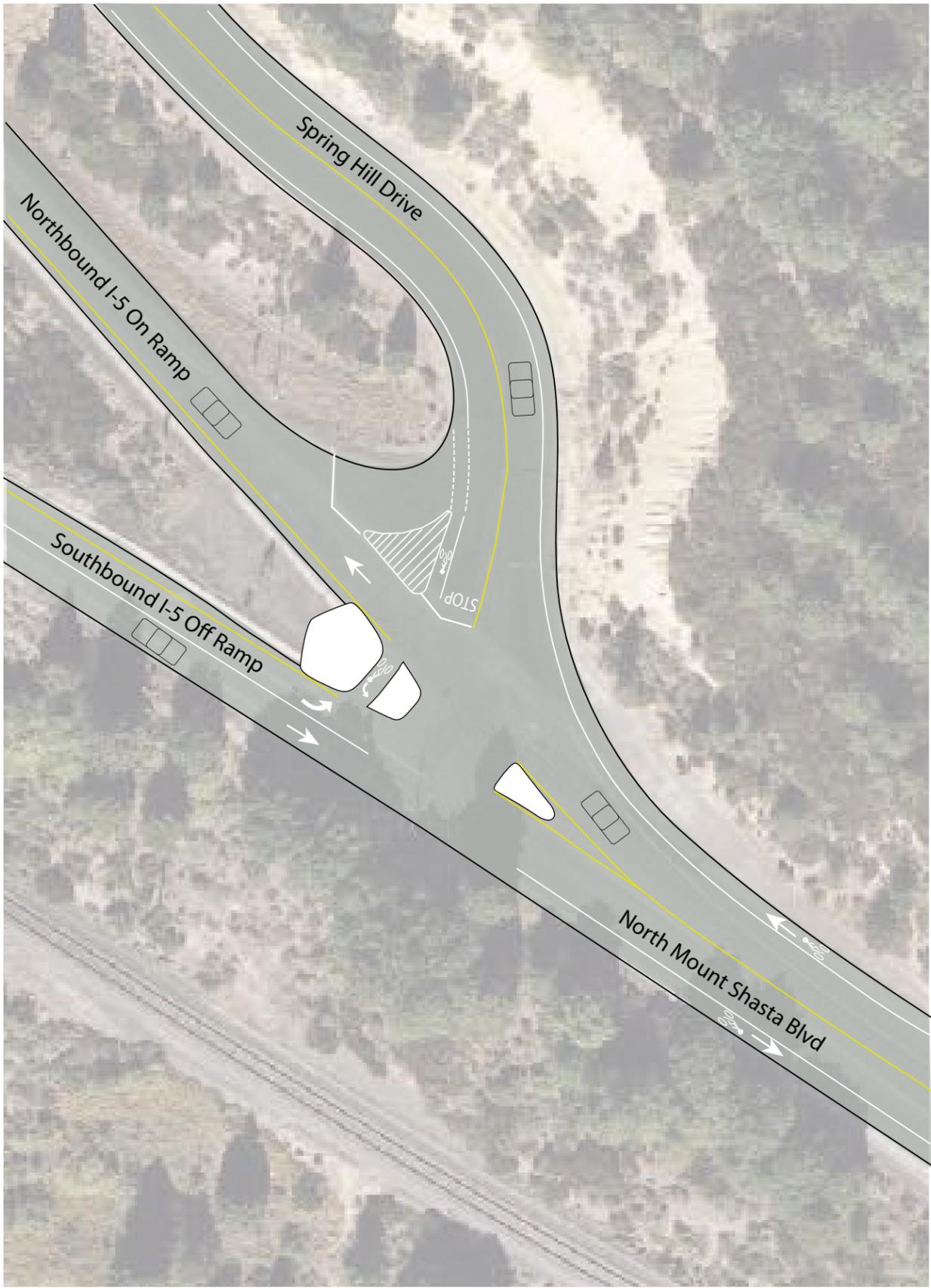
- **North and South Mount Shasta Boulevard (Spring Hill Drive to southern city limits):** Bicycle lanes will provide a north/south route through the city. This project should include intersection crossing treatments at Ream Avenue and the entrance to the I-5 on-ramp at the connection with Spring Hill Drive. Figure 5.2 shows a suggested conceptual design for this intersection. This project can be broken down into segments based on project readiness. The suggested segments are: city limits to Ream Avenue, Ream Avenue to McCloud Avenue, McCloud Avenue to Alma Street, Alma Street to Chestnut Street, Chestnut Street to Spring Hill Road.

Chestnut Street was evaluated against Mount Shasta Boulevard as an alternative route through downtown. Mount Shasta was chosen as the superior alternative due to:

- the desire to maximize facility continuity;
- its proximity to desirable destinations;
- the required turning maneuvers at the north and south ends of Chestnut Street, which create challenging cycling conditions; and
- the existing head-in diagonal parking on Chestnut Street.

The downtown segment may be appropriate for Class III signing and striping (sharrows) due to mitigating features including its limited width, frequent parking turn over and slower vehicle speeds.

This route is noted in the *Caltrans District 2 Cycling Guide* (Page 32) as an official alternative route to I-5 because an alternate route is available from the I-5 / Hw 89 interchange via Mt Shasta Blvd through Mt Shasta City to its north junction with I-5. This designation should be noted in any applications to Caltrans for funding of bicycle facilities as it may lend additional weight to any request for state funding.



- **Alma Street (Cedar Street to Rockfellow Drive):** This route will serve as a primary access route between Mount Shasta Elementary School and Sisson School. Planned and funded construction along a portion of Alma Street gives the City an opportunity to make necessary changes to the configuration of the street. Crossing treatments and signage should be installed at the railroad crossing and the signalized intersection of Alma Street and North Mount Shasta Boulevard. An extension of this facility in the future could provide connectivity to other locations within Siskiyou County.
- **Ream Avenue (South Mount Shasta Boulevard to City limits):** This route will serve as a connector to the south western areas of Mount Shasta. This route is intended as a long term recommendation. An extension of this facility in the future could provide connectivity to other locations within Siskiyou County.
- **East and West Lake Street/Hatchery Lane (city limits to Washington Drive):** This route provides good east/west connectivity with established crossings of I-5 and the Union Pacific Railroad. Bicycle warning signs should be installed on the I-5 overcrossing. Existing railings and fencing on the overcrossing should be modified to meet bicycle standards. An extension of this facility in the future could provide connectivity to other locations within Siskiyou County.
- **Rockfellow Drive (East Ivy Street to city limits):** This route provides access to the high schools and Shastice Park. The wide intersection of Rockfellow Drive and Washington Drive should receive treatments to physically or visually narrow the intersection, including raised or painted medians, curb extensions or colored shoulders and appropriate signage. Opportunities for physical narrowing may be limited due to winter snow storage. Additionally, a raised pedestrian island may help slow traffic through the intersection without impeding snow plowing or storage. Consideration should also be given to extending the paved portion of the road to Madison Drive to provide better bicycle and pedestrian access. This project may be split into two phases, with the segment from East Ivy Street to Everitt Memorial Highway taking precedence. Rockfellow Drive east to the city limits should be developed as a long term project.
- **D Street/Washington Drive/Everitt Memorial Highway/ (Old McCloud Road to Shasta Avenue):** This route provides north/south access across the city. This project can be broken down into segments based on project readiness. The plan proposes to prioritize construction of Washington Drive and Everitt Memorial Highway due to their proximity to the schools. Portions of the route, such as Washington Drive are intended as a long term recommendation. Future roadway widening or repaving projects should include plans to increase pavement width to provide adequate space for dedicated bike lanes.
- **Pine Street (West Lake Street to city limits):** This route provides north/south access from Mercy Medical Center to West Lake Street. Bicycle warning signs should be installed on the I-5 overcrossing. Existing railings and fencing on the overcrossing should be modified to meet bicycle standards.
- **Spring Hill Drive (North Mount Shasta Boulevard to City limits):** This route represents a long term, excellent opportunity to implement great bicycle facilities as development occurs along this route. Currently, ample pavement exists to strip lanes, with an excess right

of way existing in some spots. The excessive right of way may also be ample for Class I route, or separated facilities within the existing right of way. This route also serves as a great link to the county areas via Abrams Lake Road and eventually north Old Stage Road. A more detailed plan for Spring Hill Drive is consistent with the goals of the General Plan. An extension of this facility in the future could provide connectivity to other locations within Siskiyou County.

Segment details can be found in Table 5.4.

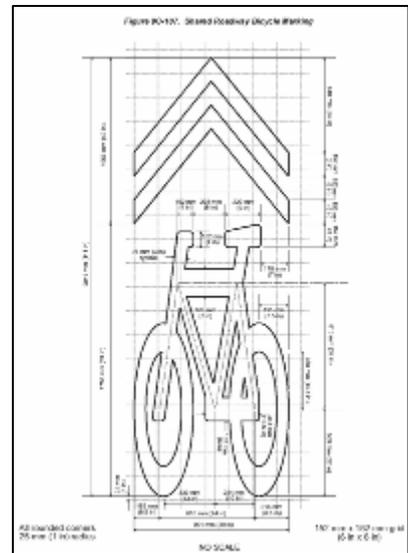
Table 5.4. Proposed Class II Facilities

Class II Facilities - Striped Bicycle Lanes (On Street)			
Segment Name		End	Length (mi)
North and South Mount Shasta Boulevard	City limits	Spring Hill Drive	2.8
East and West Alma Street	Cedar Street	Rockfellow Drive	0.6
East and West Lake Street/Hatchery Lane	City limits	Washington Drive	1.1
Rockfellow Drive	East Ivy Street	City limits	1.1
D Street /Washington Drive/Everitt Memorial Highway/	Old McCloud Road	Shasta Avenue	1.3
Pine Street	West Lake Street	City limits	0.8
Spring Hill Drive	North Mount Shasta Boulevard	City limits	1.6
Ream Avenue	City limits	South Mount Shasta Boulevard	0.7
Total			10

5.3.5. Proposed Class III

Proposed Class III bicycle routes in Mount Shasta are intended to expand the existing and proposed bikeway system, highlighting direct connections to and through neighborhoods and to schools, parks and other destinations. They should also provide alternate routes to busier streets and add alternate connections to neighboring communities. The minimum treatment for these routes would be standard Bicycle Route signage.

Segment details for Class III Signed Bicycle Routes can be found in Table 5.5. The Class III network is designed to create a continuous north/south low traffic travel route for cyclists and pedestrians augmented by Class I facilities where necessary. Shown on Map 3, the corridor begins in the south end of town on Sheldon Avenue, continues along A Street, B Street, a short stretch of McCloud Avenue and Birch Street to Sisson Meadow. The route extends north near the Sisson School and then north, up Ski Bowl Drive, to Shasta Avenue.



Neighborhood and School Access Routes

In communities throughout the United States, the idea of Bicycle Boulevards has been advanced as a way to designate certain routes as priority streets for bicycling. The viability of bicycle boulevards depends on a number of factors. One key factor is the availability of multiple duplicative parallel routes that allow most motorists to reach their destinations while avoiding the Bicycle Boulevard.

Due to its incomplete grid system, which generally lacks multiple parallel streets, Mount Shasta does not lend itself to a conventional Bicycle Boulevard treatment. The potential for through routes is constrained by and limited connectivity. Existing rights of way (e.g., between B Street and Birch Street will help to create a system of fairly connected low volume travel routes to access the downtown, provide safe walking and cycling routes to schools and access to neighborhoods. The system of collector and neighborhood streets surrounding the downtown area that provide access to commercial and school destinations, can serve as a “downtown detour” and in some cases parallel the main arterial routes.

It is recommended that some of these neighborhood and school access routes be designated for additional safety improvements that would give priority to bicycle and pedestrian users. For all segments, existing bicycle route signage would be retained. Potential improvements for these segments include:

- Shared roadway bicycle markings
- Curb extensions or bulbouts where they would not interfere with snow removal
- Share the Road signs
- Other safety signage
- Stop sign removal
- Speed humps
- Additional traffic controls

Table 5.5 provides more information about which specific segments are recommended for additional treatments. Further study of all segments would be necessary before deciding on specific traffic calming devices. Additional design guidance for traffic calmed streets is provided in the design guidelines, while information on Safe Routes to School programs and facilities are included later in this chapter and in Appendix B. A prioritized, phased approach to these improvements is detailed in Chapter 7.

Table 5.5. Proposed Class III Facilities

Class III Facilities - Signed Bicycle Routes (On-Street)			
Segment Name	Begin	End	Length (mi)
Shasta Avenue	Western terminus	Everitt Memorial Highway	0.5
Ski Bowl Drive	Rockfellow Drive	Shasta Avenue	0.3
East and West Castle Street	Maple Street	Sisson Meadows	0.2
Maple Street	Mill Street	West Castle Street	0.2
Mill Street	Sisson Street	Maple Street	0.3
Sisson Street	Mill Street	South Mount Shasta Boulevard	0.1

Class III Facilities - Signed Bicycle Routes (On-Street)			
Segment Name	Begin	End	Length (mi)
Mountain View Drive	South Mount Shasta Boulevard	Old McCloud Road	0.2
Sheldon Avenue	South Mount Shasta Boulevard	D Street	0.2
South B Street	Old McCloud Road	Gaudenzio Street	0.3
South A Street	Gaudenzio	McCloud Avenue	0.1
Cedar Street	Mount Shasta Elementary School	Northern Terminus	0.5
North B Street /Birch Street*	McCloud Avenue	East Lake Street	0.2
Chestnut Street	North Mount Shasta Boulevard	North Mount Shasta Boulevard	0.6
Gaudenzio Street	South A Street	South B Street	0.1
McCloud Avenue	South A Street	North B Street	0.1
Orem Street	South Mount Shasta Boulevard	Washington Street	0.3
Smith Street	South Mount Shasta Boulevard	D Street	0.3
Total Miles			4.6

* A portion of this segment would be Class I

5.3.6. *Intersections Recommended for Further Analysis*

Within Mount Shasta several intersections are recommended for analysis and study for pedestrian and bicycle safety enhancements. This study is outside the scope of this Plan. Challenges at these intersections are documented in Chapter 4.

- South Mount Shasta Boulevard at Sheldon Avenue
- North/South Mount Shasta Boulevard at McCloud Avenue
- Maple Street at Lake Street
- Chestnut at Ivy Street/Jessie Street
- Orem Street at Chestnut Street
- Lake Street overcrossing of I-5
- North Mount Shasta Boulevard at McCloud River Railroad crossing
- North Mount Shasta Boulevard and Chestnut Street
- Ream Avenue at South Mount Shasta Boulevard
- Ream Avenue at Union Pacific Railroad crossing
- Lake Street at Washington Drive
- East Ivy Street at Kenneth Way

5.3.7. *Bicycle Parking and End of Trip Facilities*

Bicycle parking includes standard bike racks, weather-protected bicycle parking, enclosed lockers, and secure “corrals”. Other end-of-trip facilities include showers and changing facilities.

Recommendations

Increase public bicycle parking facilities and encourage provision of shower and changing facilities

Provide bike racks at public destinations, including bus stops, community centers, libraries, parks, schools and commercial areas. 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. Please see the design guidelines for additional guidance. All bicycle parking should be in a secure area, if possible. Employers and retailers should be encouraged to provide secure indoor parking, covered bicycle parking, bicycle lockers or racks. This encouragement could come in the form of financial incentives to local businesses. Art racks may increase the visibility of bike parking while contributing to the unique look and feel of downtown Mount Shasta.

The following are potential locations for new or improved locations for inverted-u or equivalent secure bicycle parking racks:

- Shastice Park
- Sisson School
- Mount Shasta Elementary School
- Mount Shasta High School
- Jefferson High School
- Sisson Meadow Natural Area
- Mount Shasta Library
- Mount Shasta City Park
- Mount Shasta Shopping Center
- Other downtown areas



Example cowboy art rack

Require bicycle parking with new construction

Bike parking is currently not required with new construction. Requiring developers to provide bike parking will help to encourage increased bicycle use and diminish any future bike parking shortages. Suggested standards are provided in Chapter 6.

5.4. PEDESTRIAN PROJECTS

This section discusses capital project recommendations for Mount Shasta's pedestrian network. These infrastructure improvements are intended to enhance pedestrian access and circulation as well as help pedestrians feel more comfortable when walking in Mount Shasta.

A number of recommendations are made for infrastructure projects that should be implemented on a broad citywide basis. These projects were divided into several categories of improvements:

sidewalk gaps, curb ramps, signalized intersections, signal timing, and unsignalized intersections. This plan also suggests sidewalk completion along high priority pedestrian corridors. Details on this recommendation follow the citywide recommendations.

More details about specific improvement types are provided in the Design Guidelines section.

5.4.1. *Infill of Sidewalk Gaps*

Sidewalk gaps are areas in Mount Shasta where there is no sidewalk, or the sidewalk ends abruptly, resulting in a discontinuous network. Areas without sidewalks may force pedestrians to walk along the edge of the roadway, or may cause pedestrians to cross at undesigned crossing locations. Where feasible, providing a continuous pedestrian sidewalk along both sides of all of Mount Shasta's roadways is recommended.

RECOMMENDATION: A complete inventory of walkway gaps was not within the scope of this plan update. A survey of high priority corridors was conducted by the ATAC in August 2008 (Appendix A). We recommend that the City conduct an additional comprehensive sidewalk and pathway inventory to develop a detailed electronic inventory of sidewalk gaps and develop a process for prioritizing and filling these gaps.

Curb Ramps

An inventory of curb ramps was not conducted as part of research for this plan. As a part of a curb ramp inventory, data on the slope, side slope, landing dimensions, and other attributes of the curb ramp are measured in the field. An analysis of this data considers compliance with current ADA regulations for slope, lip height and presence of tactile warnings ("truncated domes"). Retrofitting the City's non-compliant curb ramps is generally something the City will accomplish as part of roadway re-paving projects (ADA requires that curb ramps be installed or brought up to compliance during street overlays).

RECOMMENDATION: Install curb ramps at all locations in the downtown and surrounding neighborhood areas where they currently do not exist. Conduct a detailed curb ramp inventory throughout the city to determine other locations that lack curb ramps or have curb ramps that do not meet current standards. Priority locations for additional inventory would include schools, neighborhood parks, and community centers. As part of normal street re-paving projects, install curb ramps if none currently exist, or upgrade existing ramps to current standards.



A curb ramp with truncated domes

Truncated Domes

Truncated domes provide a cue to visually-impaired pedestrians that they are entering a street or intersection. Since 2002, ADA Guidelines have called for truncated domes on curb ramps.

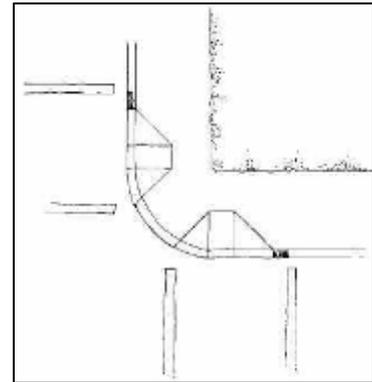
Although it is not required for Mount Shasta to install truncated domes at existing curb ramps that were built prior to 2002, it is recommended that the City continue installing these devices at high priority pedestrian locations and when re-paving and upgrading existing curb ramps to meet ADA

guidelines. Truncated domes are a very visible improvement and they are relatively inexpensive to install.

RECOMMENDATION: Install truncated domes as part of a comprehensive program to install new curb ramps and bring existing ones into compliance with current standards. This would include upgrading or installing ramps in conjunction with other road and sidewalk projects.

Curb ramp configuration

Perpendicular curb ramps are designed so two ramps are included at intersection corners. Perpendicular ramps allow pedestrians and people in wheelchairs to access the sidewalk perpendicular to stopped traffic, and to enter into the crosswalk directly in their line of travel. Two ramps per corner located in the center of each crosswalk is the preferred and recommended configuration of curb ramps for new construction according to Chapter 100 of the Caltrans Highway Design Manual. Perpendicular ramps do require more space to install than a single diagonal ramp, are more costly, and sometimes cannot be accommodated due to utilities or other obstructions at the corner.



RECOMMENDATION: Install perpendicular curb ramps in the downtown area at major intersections, on adjacent streets, in high pedestrian zones and throughout the city as needed during sidewalk reconstruction projects. Make perpendicular curb ramps the City's standard configuration for new ramp construction wherever feasible.

5.4.2. *Intersections Recommended for Further Analysis*

Several intersections and bridge crossings within the city should receive further study in order to adequately address bicycle and pedestrian safety. These intersections are listed in the bicycle facility improvements.

5.4.3. *Signalized Intersection Improvements*

There are a variety of engineering improvements that can improve pedestrians' walking experience when crossing signalized intersections. Additional details on these improvements are provided in Chapter 6 - Design Guidelines.

Signal Timing

Signal timing is the amount of time each phase of a signal is allotted for vehicles to pass through or pedestrians to cross the street. Per the CA MUTCD, standard traffic engineering design assumes that pedestrians travel at 4.0-feet per second, which is used to determine the amount of time to assign to the pedestrian clearance interval. For slower pedestrians, such as the elderly and children, this assumed walking speed may result in them not being able to fully cross the street before the light changes. By adjusting the signal timing to a slower walking rate, slower pedestrian will have more time to cross the street.

RECOMMENDATION: Consider adjusting signal timing at the signals within the city to allow for a pedestrian pace of 2.8-feet per second. This slower walking speed is consistent with MUTCD recommendations for walking rates for slower pedestrians. This recommendation could be incorporated into current research within the city on appropriate signal timing.

5.4.4. *Uncontrolled Crosswalk Improvements*

Infrastructure improvements at uncontrolled crosswalk locations can help increase the visibility of pedestrians to motorists and improve the pedestrians' walking experience. These improvements are for both unmarked and marked crosswalks at intersections.

High-Visibility Crosswalk Markings

There are a variety of different striping styles for crosswalks; the City of Mount Shasta utilizes the standard "transverse" style, consisting of two parallel lines. A second style, the "ladder" style, consists of the two parallel lines with perpendicular ladder bars striped across the width of the crosswalk. Ladder style crosswalks are used in locations where heightened pedestrian visibility is important, such as around school areas. Mount Shasta does currently not utilize high visible "ladder" style crosswalks at this point

RECOMMENDATION: Install ladder crosswalk markings at all uncontrolled crosswalk locations with existing tranverse style markings. The City should also consider installing high-visibility ladder crosswalk markings at uncontrolled crosswalks on local streets adjacent to schools and at other locations, on a case-by-case basis.

Curb Extensions

Curb extensions, also called "bulb-outs" to describe their shape, are engineering improvements intended to reduce pedestrian crossing distance and increase visibility. In addition to shortening the crosswalk distance, curb extensions serve to increase pedestrian visibility by allowing pedestrians to safely step out to the edge of the parking lane where they can see into the street, also making them more visible to oncoming drivers. Curb extensions can also improve safety by visually narrowing the roadway, cueing drivers to reduce their speed. Despite their advantages, curb extensions can require major re-engineering of the street, can be costly, may interfere with snow removal activities and are not appropriate for all situations.

RECOMMENDATION: With due consideration for snow removal requirements, investigate the feasibility of installing curb extensions at crosswalk locations, particularly in the downtown area, where appropriate.

5.4.5. *Priority Pedestrian Corridor Sidewalk Infill*

The following list of pedestrian projects was developed from past public and Staff input, field visits and consultation with the ATAC. The projects detailed below occur on the prioritized pedestrian travel corridors surveyed by the ATAC. Intersections should be striped with high visibility crosswalks and warning signage. Note that all new crosswalk locations assume installation of curb ramps to meet ADA requirements.

- Pine Street (West Lake Street to I-5): Approximately 1,000 feet of sidewalk
- East and West Lake Street (I-5 to Washington Drive): Approximately 500 feet of sidewalk
- Chestnut Street (McCloud Avenue to North Mount Shasta Boulevard): Approximately 1,700 feet of sidewalk
- East and West Alma Street (Pine Street to Rockfellow Drive): Approximately 1,400 feet of sidewalk

- Old McCloud Road (Ream Avenue to D Street): Approximately 1,500 feet of sidewalk
- North and South Mount Shasta Boulevard. This project can be divided into 5 segments:
 - (Bear Springs Road to Mountain View Drive): Approximately 350 feet of sidewalk. Low Priority. This section is planned for paving along the east side only.
 - (Mountain View Drive to Sisson Street): Approximately 1,100 feet of sidewalk. Medium Priority.
 - (Sisson Street to East Ivy Street): Approximately 1,150 feet of sidewalk, mostly on north side of street High Priority.
 - (East Ivy Street to Hinkley Street): Approximately 2,200 feet of sidewalk. Medium Priority
 - (Hinkley Street to Nixon Road): Approximately 1,800 feet of sidewalk. Low Priority. This section is planned for paving along the east side only.
- Rockfellow Drive (Everitt Memorial Highway to Adams Drive): Approximately 1,000 feet of sidewalk
- D Street/ Washington Drive/ Everitt Memorial Highway (Old McCloud Avenue to Mount Shasta High School) Approximately one mile of sidewalk
- Cedar Street (Mount Shasta Elementary School to Northern Terminus): Approximately 3,700 feet. About half of this length bounds undeveloped land. The second half of the project is recommended as a long term improvement.

5.5. RECOMMENDED BICYCLE AND PEDESTRIAN ENFORCEMENT, EDUCATION AND SUPPORT PROGRAMS

Mount Shasta’s Education and Outreach programs are designed to raise awareness of bicycling walking; connecting current and future cyclists and pedestrians to existing resources; educating them about their rights and responsibilities. The following programs are recommended for implementation in the City of Mount Shasta

Key target audiences include drivers; current and potential (interested) cyclists; students, children and families; school personnel; and employees (through employer programs).

Bike Rodeos

Target	Children and youth
Primary agency	City of Mount Shasta
Partners	Mount Shasta Police or Fire Department, Mountain Wheelers Bicycle Club, Mount Shasta Community Resource Center
Key elements	Drop-in event aimed at teaching kids basic skills and safety rules. Often organized by Police or Fire Departments. Can include free or low-cost helmet distribution.
Time frame	Fall and spring, annually
Cost	\$
Potential funding sources	Bike shops (in-kind donations); transit agencies and local news outlets; traffic safety foundations and grant programs; hospitals and insurance companies
Sample programs	http://www.bicyclinglife.com/SafetySkills/BicycleRodeo.htm http://www.saferoutestoschools.org/pdfs/lessonplans/RodeoManualJune2006.pdf Burden/Williams Bike Rodeo Guide (http://stores.kepubs.com/-strse-76/0184/Detail.bok)

Bicycle rodeos are a safe cycling event that include bicycle safety checks, safety talk that includes rules of the road and the importance of wearing a helmet, and the interactive learning experience of riding through a “chalk street” course. Bicycle rodeos usually focus on ages 5 through 14. The rodeos allow young bicyclists to learn and practice skills needed for competent bicycling in a protected environment.

Adult Cycling Skills Education

Target	Current and potential adult cyclists
Primary agency	City of Mount Shasta
Partners	Mount Shasta Police or Fire Department
Key elements	On-bike skills training for adult cyclists
Time frame	Flexible (one-time or on-going)
Cost	\$
Potential funding sources	Bike shops; transit agencies and local news outlets; traffic safety foundations and grant programs; hospitals and insurance companies
Sample programs	League of American Bicyclists skills courses: http://bikeleague.org/programs/education/courses.php

Most bicyclists learn to ride a bike when they are children, and do not have the opportunity to learn riding skills or safe road positioning. Adult bike skills training is an excellent way to improve both cyclist confidence and safety. Any training should include a significant on-bike section.

The League of American Bicyclists has developed a comprehensive bicycle skills curriculum that is considered the national standard for adults seeking to improve their on-bike skills. Various classes are offered, including basic and advanced on-road skills, and commuting (as well as driver education and youth courses). The local League of American Bicyclists chapter offers “Street Smarts Cycling” classes, where participants can learn how to safely operate a bicycle under various conditions, and learn about bicyclists’ rights and responsibilities. There are currently three League-certified instructors within 60 miles of the City of Mount Shasta. Contact the League of American Bicyclists to schedule a course with these instructors.

Police Education Courses

Target	Law enforcement agencies
Primary agency	City of Mount Shasta
Partners	City of Mount Shasta Police Department, Siskiyou County Sheriff's Department
Key elements	Pedestrian and Bicycle Law Enforcement Training Course includes a How Pedestrian and Bicycle Crashes Happen, Education on Pedestrian Laws and Bicycle Laws, and Crash Investigation and Reporting. The course can be open to all law enforcement entities for a fee, which covers instruction and materials.
Time frame	Spring, annually
Cost	\$ - \$\$
Potential funding sources	Federal and state safety grant funding
Sample programs	http://www.bicyclinginfo.org/enforcement/training.cfm http://www.massbike.org/police/

The City of Mount Shasta should work with the Police Department to provide bicycle traffic education to police officers focusing on the rights and responsibilities of bicyclists and the practice of proper bicycle positioning techniques in traffic. Bicycle traffic education should be integrated into trainings for all City of Mount Shasta police officers. In addition to developing awareness of the challenges of maneuvering a bicycle in traffic, a bicycle safety-training course should provide a list of guidelines to assist with bicycle-related collision reports. This helps ensure valuable documentation of information for public health studies regarding injury prevention. A League Certified Instructor should administer the bicycle safety training.

Create Bike and Walking Maps

Target	Current and potential cyclists and walkers
Primary agency	City of Mount Shasta or Mount Shasta Chamber of Commerce
Partners	City of Mount Shasta Police Department and Siskiyou County
Key elements	Clear symbology, designations and services attractive for cyclists and walkers, good selection of routes
Time frame	One-time, with regular updates; can happen at any time
Cost	\$\$ - \$\$\$
Potential funding sources	Bike shops (in-kind donations); transit agencies and local news outlets (donated ad space); traffic safety foundations and grant programs; hospitals and insurance companies
Sample programs	http://www.sfbike.org/download/map.pdf http://www.cityofchicago.org/Transportation/bikemap/keymap.html http://www.nycbikemaps.com/

One of the most effective ways of encouraging people to bike and walk is through the use of maps and guides showing that the infrastructure exists, to demonstrate how easy it is to access different parts of the city by bike or on foot, and to highlight unique areas, shopping districts or recreational areas. Bicycling and walking maps can be used to promote tourism, encourage residents to walk, or promote local business districts. Maps can be citywide, district-specific, or neighborhood/family-friendly maps.

"State of Bicycling in Mount Shasta" Report

Target	Current and potential cyclists
Primary agency	City of Mount Shasta or the Alternative Transportation Advisory Committee
Partners	Local bicycle advocacy groups and enthusiastic cyclists
Key elements	Annual update on Mount Shasta's bicycle resources, maps and map orders, safety, events, groups
Time frame	Annually, ongoing
Cost	\$
Potential funding sources	Low cost; may not require outside funding
Sample programs	San Francisco Bike Report Card: http://www.sfbike.org/download/reportcard_2008/SF_bike_report_card_2008.pdf

Mount Shasta already has resources for cyclists, and more services and resources are planned for the future. The “State of Bicycling in Mount Shasta” report should be designed as an annual update on Mount Shasta’s progress with implementing its bicycle initiatives. The report can also serve as an informational piece on bicycling for citizens. It should include laws and statutes related to bicycling, lists of bicycling groups and local bike shops, current projects and how to get involved, maps and brochures and how to find them, and relevant phone numbers for pothole repair, parking enforcement, and bike rack installation.

Mount Shasta Bike Central Website

Target	Current and potential cyclists
Primary agency	City of Mount Shasta
Partners	Local bicycle advocacy groups and enthusiastic cyclists
Key elements	Resources, maps and map orders, safety, events, groups
Time frame	Ongoing
Cost	\$ - \$\$ (depending on design and scope)
Potential funding sources	Low cost; may not require outside funding
Sample programs	Vélo Québec website: http://www.velo.qc.ca/english/home.lasso

The Mount Shasta Bike Central website should contain:

- A list of all **bicycling groups**, including clubs, racing teams, and advocacy groups and links to their websites
- Information about **current projects and how to get involved** (e.g., public meetings, comment periods)
- **Maps and brochures** (links to online 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 bike contacts** (City of Mount Shasta, Mount Shasta Police Department, United States Forest Service, Siskiyou County Sheriff’s Office, etc.)
- Information about **cycling events** (rides, classes, volunteer opportunities)
- A list of **local bike shops**, including phone number and address
- Relevant **phone numbers** (hotlines for pothole repair, parking enforcement, bike rack installation request, etc.)

The website may also feature:

- Events calendar
- Request form for route planning assistance
- Message boards
- Blog featuring stories and news
- Photo galleries from events and submitted by readers
- Popular ride routes

Note that these additional features may increase the cost to set up and maintain the website.

A one-stop bike website will not be difficult to set up, but it will only be successful if the site is both easy to use and updated regularly. Corners should not be cut in either design or in maintenance of the site and its information. All Bike Central website content should be reviewed annually for accuracy.

The bicycle community can assist in keeping the site up to date.

Perform Annual Bicycle and Pedestrian Counts

Target	N/A
Primary agency	City of Mount Shasta or the Alternative Transportation Advisory Committee
Partners	Siskiyou County, bicycle advocacy groups, health organizations, etc
Key elements	Annual bicycle user counts and surveys at set locations to provide for evaluation over time.
Time frame	Annually
Cost	\$\$-\$\$\$
Potential funding sources	
Sample programs	National Bicycle & Pedestrian Documentation Project (http://www.fhwa.dot.gov/environment/bikeped/study/)

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 the City of Mount Shasta perform and/or coordinate annual counts of bicyclists (and pedestrians if desired) according to national practices. The National Bicycle and Pedestrian Documentation Project 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
- Periodic administration of the existing 2007 “Survey Regarding Bicycling and Walking” in Mount Shasta

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, law enforcement, and engineering measures. Walking and biking to school are healthy alternatives to being driven, and can provide a sense of independence for children who may otherwise be restricted by school buses or parents’ schedules. Safe Routes to School programs typically involve partnerships among municipalities, school districts, community and parent volunteers, and law enforcement agencies. Among the goals of SR2S programs is improved safety for children, establishing good health and fitness habits in children, and decreased traffic and air pollution. SR2S programs help integrate physical activity into the everyday routine of school children. SR2S programs also address the safety concerns of parents by encouraging greater enforcement of traffic laws, educating the public, and exploring ways to create safer streets. A Safe Routes to School Toolkit is provided in Appendix B.

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CHAPTER 6. Design Standards and Guidelines

6.1. REVIEW OF EXISTING STREET DESIGN STANDARDS

Mount Shasta currently utilizes the street design standards of Redding, CA². The following is a review of the existing design guidelines relevant to the bicycle and pedestrian environment.

6.1.1. *Streets*

The Redding design standards provide designs for several different street cross sections. Street classifications include: residential local, commercial/industrial, residential collector, minor arterial, arterial, expressway, as well as specific versions of each.

- Geometric Design standards for minimum right-of-way and pavement widths (curb to curb distance), do not in all cases consider space for bicycle facilities.
- Standard shoulder and parking lane widths are appropriate for their intended uses.
- Curb radii are listed at twenty-nine feet on local streets and thirty-nine feet on collector and arterial streets.

6.1.2. *Driveways/Access*

Parcels are limited to two driveways per street frontage for circular one-way facilities. Parcels are also stated to be limited to one driveway per parcel without distinction or clarity on how this differs from the previously mentioned situation. Minimum driveway width is recommended at seventeen feet for one and two family residences. All other driveways are recommended to be approximately twenty-five feet. The maximum driveway width is stated as twenty-eight feet for one and two family residences and forty feet for commercial drives.

Driveways may not be located closer than three feet from a side property line (with exceptions). Driveways may not be located closer than six feet from existing or future alleys. Driveway grade is recommended to be no more than eight per cent. No driveway shall be located closer than five feet from a utility or safety device.

Any abandoned driveways shall be removed and replaced with standard curb, gutter and sidewalk concurrently with construction projects.

Driveways are not permitted within twenty feet of a curb return on local streets where the radius of the return is less than forty feet. Also, no portion of a driveway may occur within the curb return on a local street where the radius of the return is less than sixty feet. Driveways may encroach when curb returns are greater than sixty feet.

² Available at <http://www.ci.redding.ca.us/TransEng/Engineering/engineering.cfm>

6.1.3. *Bicycle Facilities*

The recommended bike lane width is six feet for expressways, arterials, and collectors. A width of five feet is recommended for local streets.

The city standards do not mention the existence of the bicycle facility design guidelines for Class I, II and III facilities provided by Caltrans in Chapter 1000 of the Highway Design Manual. Nor do the city standards contain any other bicycle facility design guidance. .

6.1.4. *Pedestrian Facilities*

The standards include a five-foot minimum sidewalk width. A separate standard for commercial or high pedestrian traffic areas is not included. The sidewalk standard is a curb tight design. A Separated Sidewalk Alternative is also included in the construction standards. It includes a six foot wide minimum planter area. The Separated Sidewalk standard does not match the street right-of-way standard and thus requires the acquisition of an easement for implementation. Width from right-of-way line to curb face or shoulder is specified to be a minimum of ten feet. This width is inadequate to accommodate streetscapes with vegetated buffers and adequate sidewalk space.

The city also has a standard design for a meandering sidewalk with radii that sufficiently accommodate the needs of bicyclists. Adequate cross slope for drainage purposes is indicated for each sidewalk standard. Maximum slope of the area between the curb and the sidewalk (the curb ramp) is listed at 6:1 (Horizontal:Vertical), which is greater than ADA standard of 12:1 or 8.33%.

6.1.5. *Deficiencies - bicycle facilities*

Items not found within the standard construction design standards include: Class I, II and III bike facilities, bicycle signs including Share the Road and Bicycle Route signs, details for locating and proper dimensions of bicycle parking racks and lockers. This chapter recommends basic bicycle design standards to fill deficiencies in the current standards and provide supplemental guidance.

6.1.6. *Deficiencies - Pedestrian facilities*

Standard designs were not found for mid-block crossings or intersection details including: pavement crosswalk markings, refuge islands or curb extensions. Curb ramp design standards do not meet current Title 24 regulations with respect to preferred location of ramps. This chapter recommends basic pedestrian design standards to fill deficiencies in the current standards and provide supplemental guidance.

6.2. BIKEWAY DESIGN GUIDELINES

This section provides basic bikeway planning and design guidelines for use in developing the Mount Shasta bikeway system and support facilities. All recommendations in this appendix fall into one of three categories:

- “Design Requirements” for Class I, II and III facilities contain elements required by the State of California for compliance with Caltrans Chapter 1000 “Bikeway Planning and Design” guidelines.

- “Additional Design Recommendations” provide 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.
- “Experimental or Nonstandard Best Practices” provides information about optional innovative bikeways and support facilities that have not been adopted for use in California and are not covered by Caltrans Chapter 1000 design requirements.

All facility designs are subject to engineering design review.

6.2.1. 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 by not required by Caltrans.

Figure 6.1 provides an illustration of these three types of bicycle facilities.

6.2.2. Class I Bikeway - Design Requirements

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:

- Eight feet (2.4 m) is the minimum width for Class I facilities
- Eight 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
- Ten feet (3.0 m) is the recommended minimum width for a typical two-way bicycle path
- Twelve 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
- A minimum two-foot (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 6.2 illustrates a typical cross-section of a Class I multi-use path.

Figure 6.1: Bicycle Facility Types

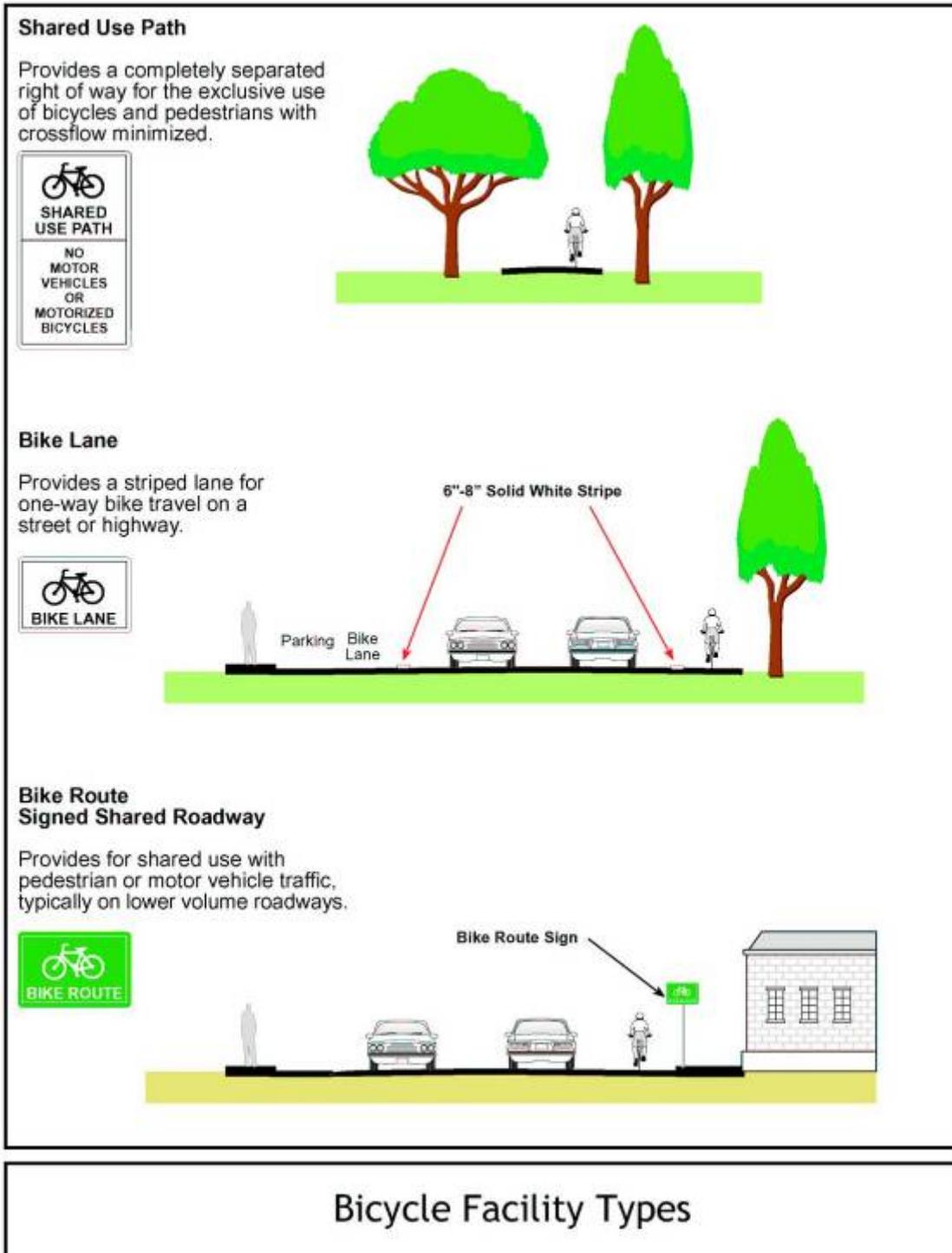
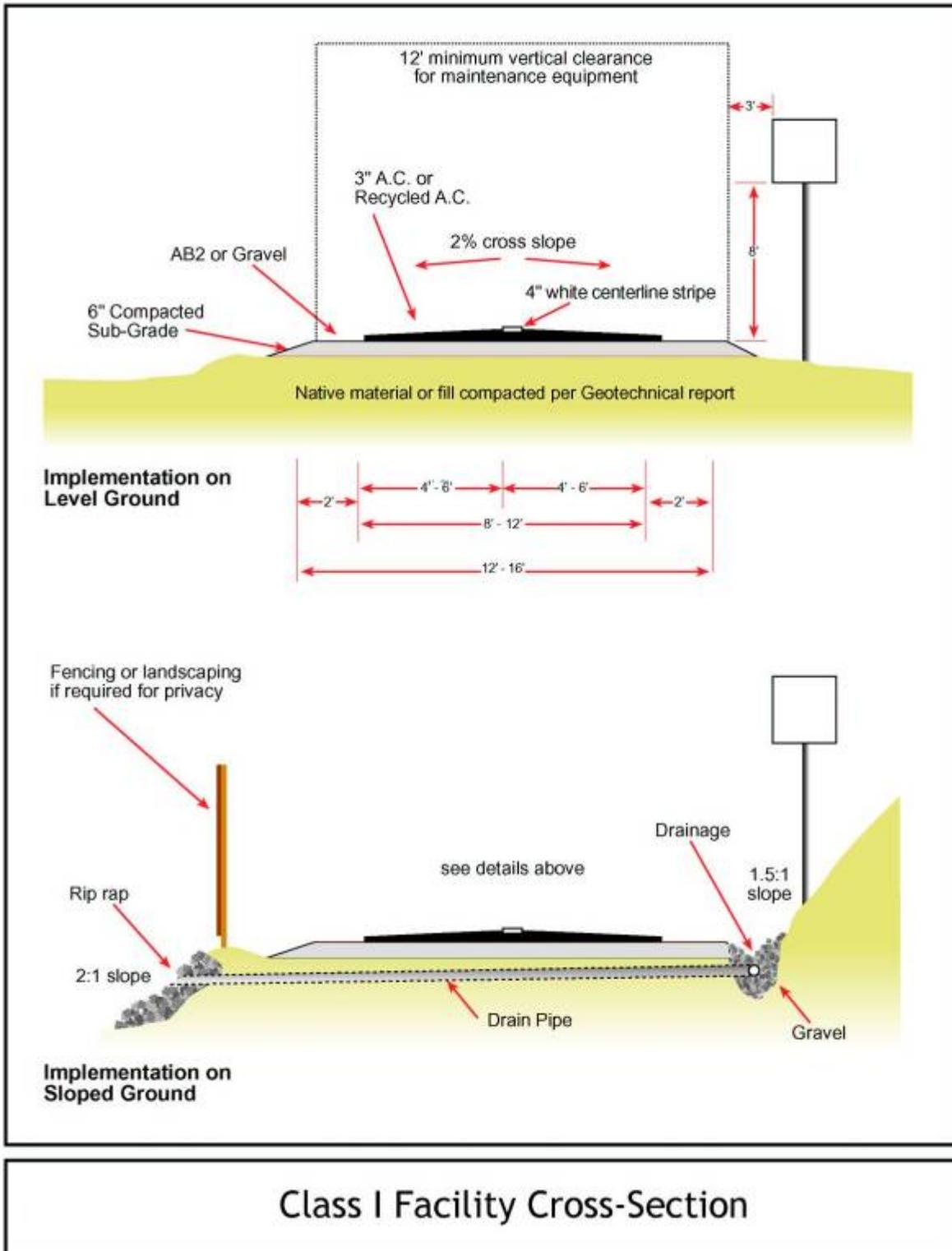


Figure 6.2: Class I Facility Cross-Section



6.2.3. *Class I Bikeway - Additional Design Recommendations:*

1. It is important that pavement markings on roadways be visible and durable. Recessed thermoplastic is recommended to be used as paint gets worn quickly and can fade or disappear in a matter of 1-3 years. Recessing the markings into the pavement can help avoid wear associated with winter plowing.
2. Multiuse trails and unpaved facilities that serve primarily a recreation rather than a transportation function and will not be funded with federal transportation dollars may not be required to be designed to Caltrans standards. However, state and national guidelines have been created with user safety in mind and should be followed. Wherever any trail facility intersects with a street, roadway, or railway, standard traffic controls should always be used.
3. Class I bike path crossings of roadways require preliminary design review. Generally speaking, bike paths that cross roadways with average daily trips (ADTs) over 20,000 vehicles will require signalization or grade separation.
4. Landscaping should generally be low water consuming native vegetation and should have the least amount of debris.
5. Lighting should be provided where commuters will use the bike path during hours of darkness.
6. Barriers at pathway entrances should be clearly marked with reflectors and be ADA accessible (minimum five feet clearance).
7. Bike path construction should take into account impacts of maintenance and emergency vehicles on shoulders and vertical and structural requirements. Paths should be constructed with adequate sub grade compaction to minimize cracking and sinking.
8. All structures should be designed to accommodate appropriate loadings. The width of structures should be the same as the approaching trail width, plus minimum two-foot wide clear areas.
9. Where feasible, provide two-foot wide unpaved shoulders for pedestrians/runners, or a separate tread way.
10. Direct pedestrians to the right side of pathway with signing and/or stenciling.
11. Consider using bicycle signal heads at locations where sidepaths meet signalized intersections.

6.2.4. *Class II Bikeway - Design Requirements*

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 6.3 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 Mount Shasta Standards and are subject to engineering design review.

- Four feet (1.2 m) minimum if no gutter exists, measured from edge of pavement.
- Five feet (1.5 m) minimum with normal gutter, measured from curb face; or 3’ (0.9 m) measured from the gutter pan seam.
- Five feet (1.5 m) minimum when parking stalls are marked.
- Eleven feet (3.3 m) minimum for a shared bike/parking lane where parking is permitted but not marked on streets without curbs; or 12’ (3.6 m) for a shared lane adjacent to a curb face.
- As required in the CA MUTCD, “on bikeways signal timing and actuation shall be reviewed and adjusted to consider the needs of bicyclists.” Signal loop detectors that sense bicycles are required for all bikeways. A standard stencil of a bicycle and the words “Bicycle Loop” should identify the location of the detectors (Figure 9C-7 CA MUTCD).

6.2.5. *Class II Bikeway - Additional Design Recommendations:*

1. It is important that pavement markings on roadways visible and durable. Recessed thermoplastic is recommended to be used as paint gets worn quickly and can fade or disappear in a matter of 1-3 years. Recessing the markings into the pavement can help avoid wear associated with winter plowing.
2. Intersection and interchange treatment – Caltrans provides recommended intersection treatments in Chapter 1000 including bike lane “pockets” and signal loop detectors. The Department of Public Works should develop a protocol for the application of these recommendations, so that improvements can be funded and made as part of regular improvement projects.
3. In addition to the requirements for detection and timing on bikeways discussed in the previous section, signal loop detectors that sense bicycles should be considered for all arterial/arterial, arterial/collector, and collector/collector intersections. Where loop detectors are installed, traffic signal phasing should be set to accommodate bicyclists. A standard stencil of a bicycle and the words “Bicycle Loop” should identify the location of the detectors (Figure 9C-7 CA MUTCD).
4. Bicycle-sensitive loop detectors are preferred over a signalized button specifically designed for bicyclists (see discussion of loop detectors, below).
5. Bike lane pockets (min. 4’ wide) between right turn lanes and through lanes should be provided wherever available width allows, and right turn volumes exceed 150 motor vehicles/hour.

6. Where bottlenecks preclude continuous bike lanes, they should be linked with Class III route treatments.
7. A bike lane should be delineated from motor vehicle travel lanes with a solid 6" white line, per CA MUTCD. An 8" line width may be used for added distinction.
8. Word and symbol pavement stencils should be used to identify bicycle lanes, as per Caltrans and CA MUTCD specifications.
9. Narrowing automobile travel lane widths.
10. Bicycle signal heads may be used at locations with extremely high motorist-cyclist conflicts.

Installing bike lanes may require more attention to continuous maintenance issues. Bike lanes tend to collect debris as vehicles disperse gravel, trash, and glass fragments from traffic lanes to the edges of the roadway. Striping and stenciling will need periodic replacing.

Poorly designed or placed drainage grates can often be hazardous to bicyclists. Drainage grates with large slits can catch bicycle tires. Poorly placed drainage grates may also be hazardous, and can cause bicyclists to veer into the auto travel lane.

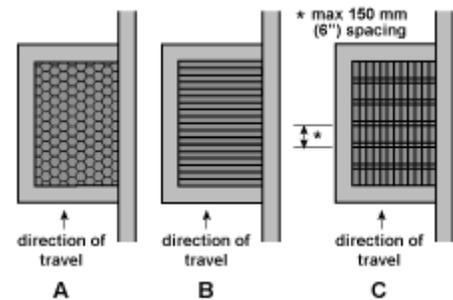


Figure 6.3 Examples of bicycle friendly drainage grates

Bicycle Left-turn Pocket Lane

This treatment shows a standard-width bicycle lane adjacent to the left-hand turn lane in order to reduce conflicts with turning vehicles. The Bicyclists Merging sign may be placed on the right side of the road before the left-side turn pocket. This treatment has been used in San Francisco, CA and Flagstaff, AZ.

Potential applications include:

- Low-moderate speeds
- On lower volume arterials and collectors
- Heavy vehicular left-hand turning movements

Figure 6.4: Typical Class II Facility Cross-Section

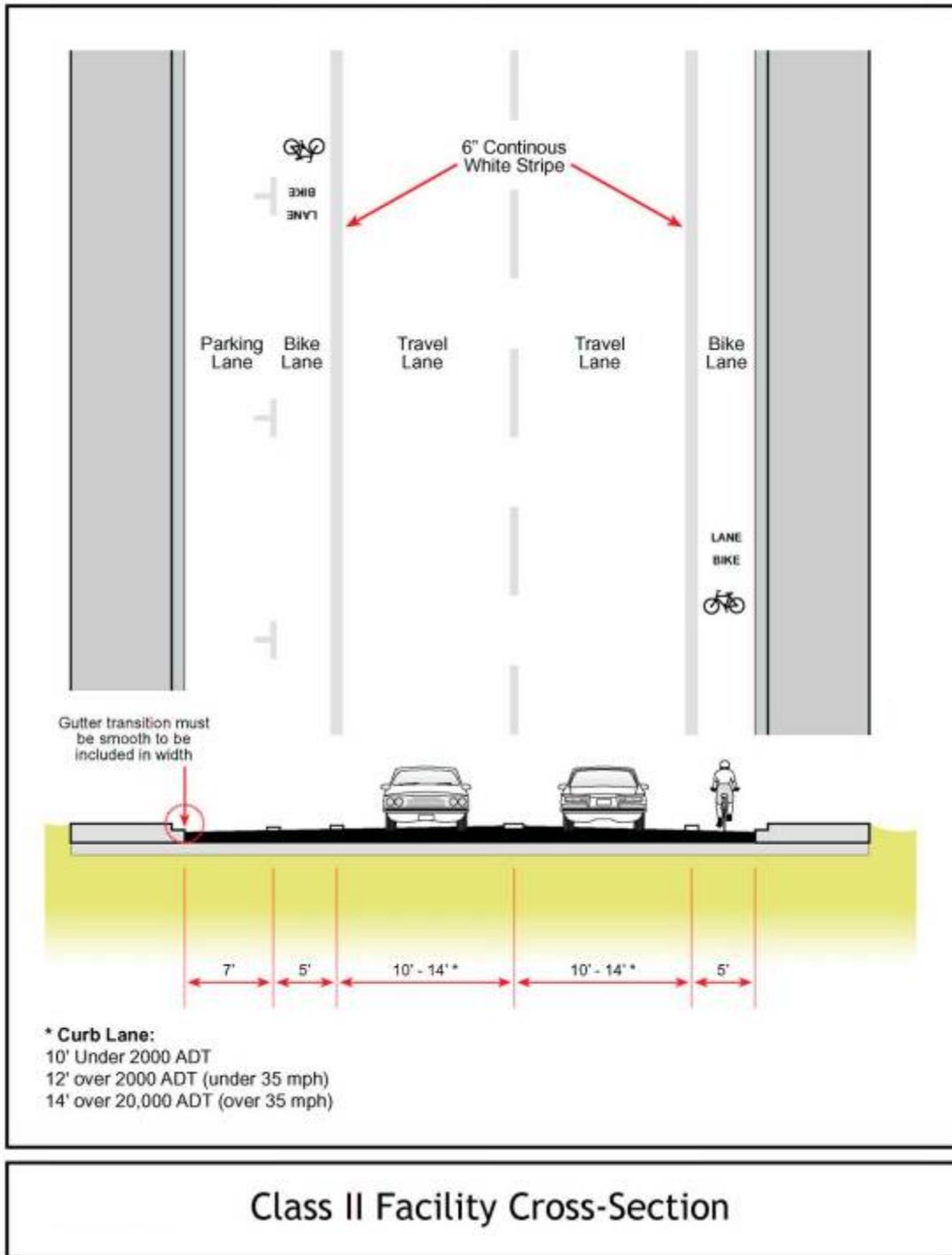
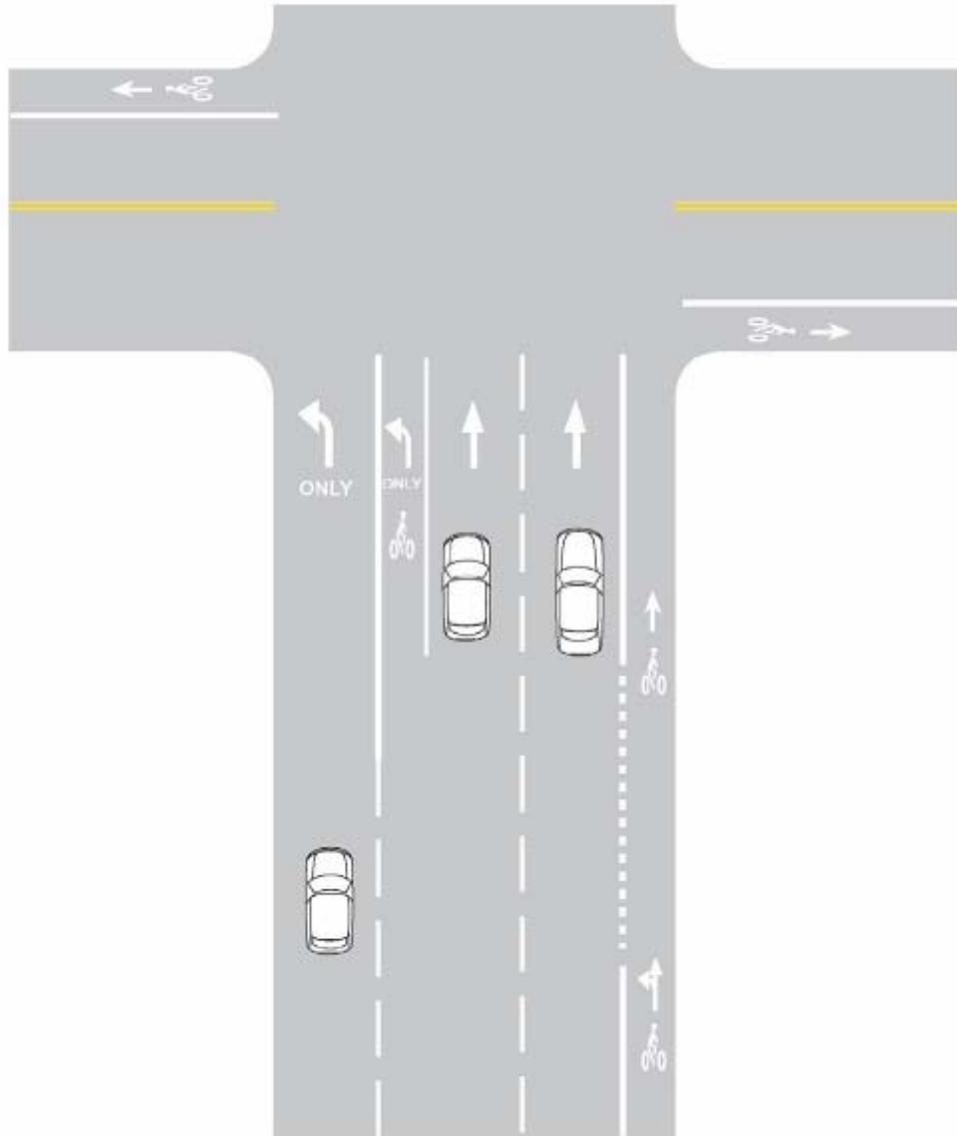


Figure 6.5: Bicycle Left-turn Pocket Lane



6.2.6. *Class III Bikeway - Design Requirements*

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') 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.

6.2.7. Class III Bikeway - Additional Design Recommendations

Shared Roadway Bicycle Marking

Recently, Shared Lane Marking stencils (also called “Sharrows”), 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 6.6 (p. 6-14) illustrates recommended on-street Shared Lane Marking stencil placement. The “Chevron” marking design recommended by Caltrans is shown below in Figure 6.7. The following pavement markings were adopted for official use by Caltrans on 9/12/2005 as part of the California MUTCD.

Guidance language provided by Caltrans for use of the Shared Lane Marking is as follows:

Section 9C.103 Shared Roadway Bicycle Marking

Option:

The Shared Roadway Bicycle Marking shown in Figure 9C-107 may be used to assist bicyclists with positioning on a shared roadway with on-street parallel parking and to alert road users of the location a bicyclist may occupy within the traveled way.

Standard:

The Shared Roadway Bicycle Marking shall only be used on a roadway which has on-street parallel parking. If used, Shared Roadway Bicycle Markings shall be placed so that the centers of the markings are a minimum of 3.3 m (11 ft) from the curb face or edge of paved shoulder. On State Highways, the Shared Roadway Bicycle Marking shall be used only in urban areas.

Option:

For rural areas, the SHARE THE ROAD (W16-1) plaque may be used in conjunction with the W11-1 bicycle warning sign (see Sections 2C.51 and 9B.18). Information for the practitioner regarding classification of rural versus urban roadways can be found at the following California Department of Transportation website: <http://www.dot.ca.gov/hq/tsip/hpms/Page1.php>

Guidance:

If used, the Shared Roadway Bicycle Marking should be placed immediately after an intersection and spaced at intervals of 75 m (250 ft) thereafter. If used, the Shared Roadway Bicycle Marking should not be placed on roadways with a speed limit at or above 60 km/h, (40 mph).

Option:

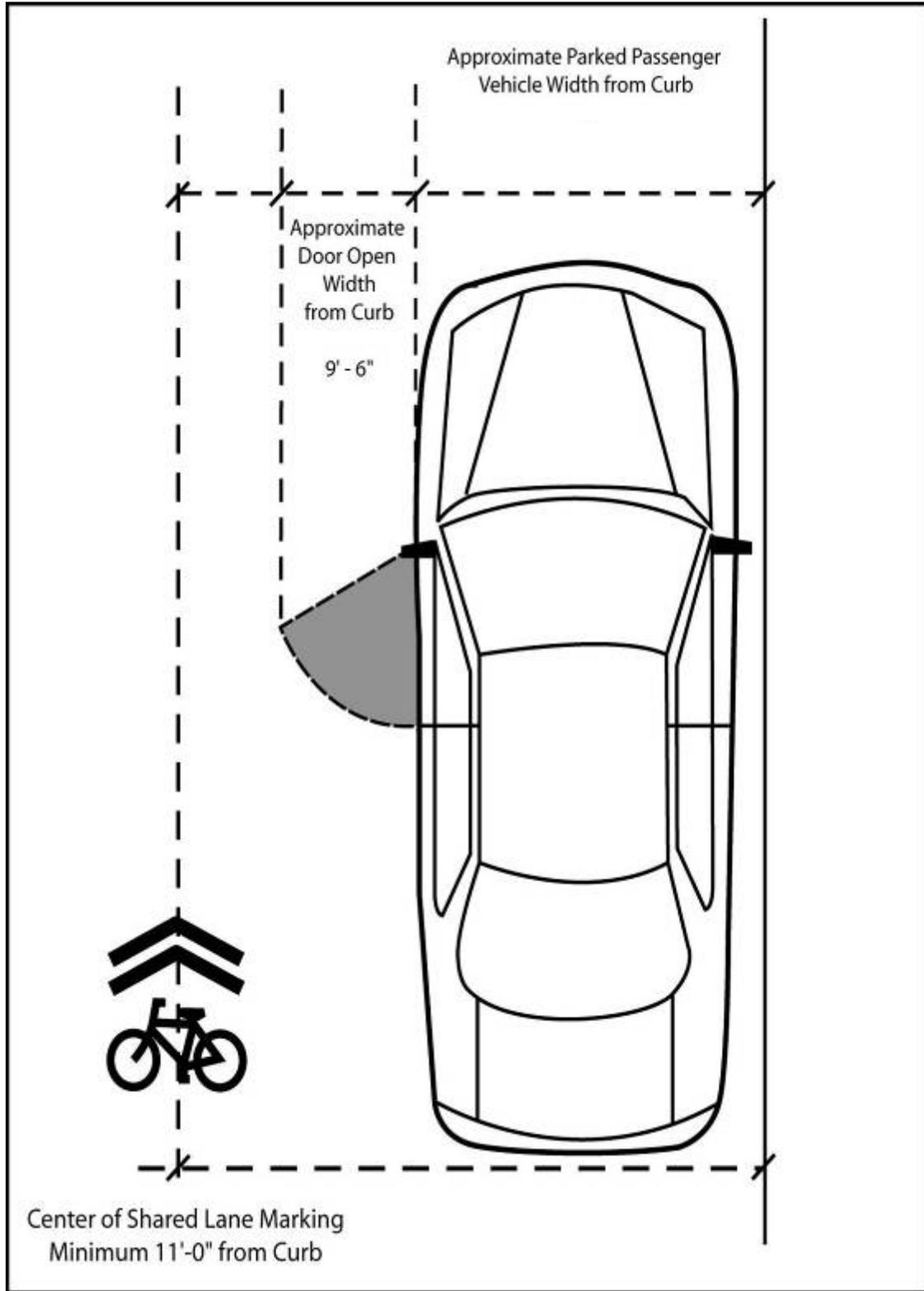
Where a Shared Roadway Bicycle Marking is used, the distance from the curb or edge of paved shoulder may be increased beyond 3.3 m (11 ft). The longitudinal spacing of the markings may be increased or reduced as needed for roadway and traffic conditions. Where used, bicycle guide or warning signs may supplement the Shared Roadway Bicycle Marking.

Support:

The Shared Roadway Bicycle Marking is intended to:

- *Reduce the chance of bicyclists impacting open doors of parked vehicles on a shared roadway with on-street parallel parking.*
- *Alert road users within a narrow traveled way of the lateral location where bicyclists ride.*
- *Be used only on roadways without striped bicycle lanes or shoulders.*

Figure 6.6: Shared Lane Marking Placement



Bicycle Boulevard

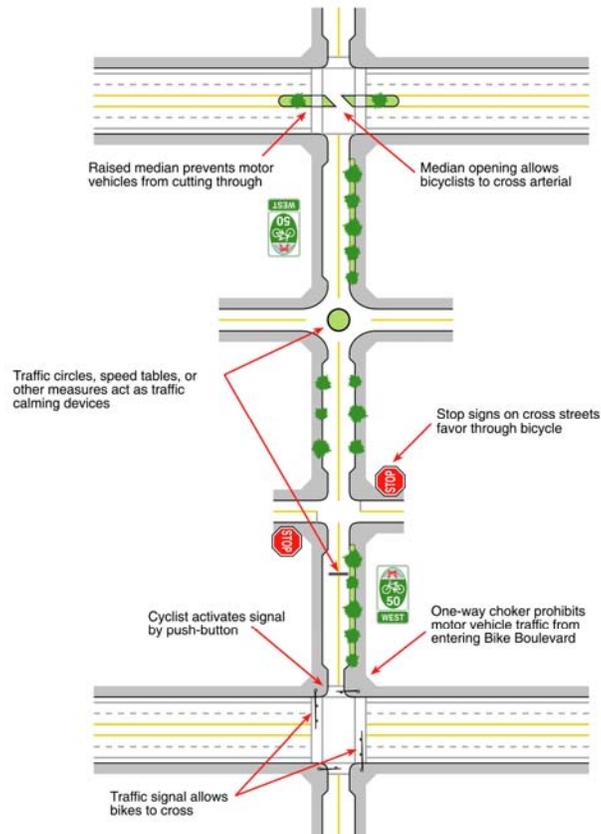
A bicycle boulevard treatment is typically a lower volume street with traffic calming treatments that parallels a higher volume arterial. Traffic calming typically includes a set of improvements to slow traffic and prevent cut-through traffic such as: traffic circles, chokers, and medians. In addition, stop signs favor bicyclists by stopping perpendicular traffic. Sensor loops activate traffic signals to allow safe crossings of higher volume roadways. The following design considerations apply to a bicycle boulevard:

- Typically used on low volume streets.
- Traffic-calmed streets located within 1/4 mile of parallel arterials.
- Allows access to key destinations.
- Provides safe arterial street crossing for cyclists.
- Possible Speed Limit reduction from 25 MPH to 20 MPH.

Figure 6.8 illustrates a typical bicycle boulevard street configuration.

For more information, see the City of Berkeley Bicycle Boulevard *Design Tools and Guidelines* at <http://www.ci.berkeley.ca.us/transportation/Bicycling/BB/Guidelines/linkpag.htm>

Figure 6.8: Example Bicycle Boulevard



6.2.8. *Bikeway Support Facilities*

In a nationwide Harris Poll conducted in 1991, almost half the respondents stated that they would sometimes commute to work by bicycle, or commute more often, if there were showers, lockers, and secure bicycle storage at work. Cyclists' needs for bicycle parking range from simply a convenient piece of street furniture, to storage in a bicycle locker that affords weather, theft and vandalism protection, gear storage space, and 24-hour personal access. Most bicycles today cost 350 dollars to over 2,000 dollars and are one of the top stolen items in all communities, with components being stolen even when a bicycle is securely locked. Theft can be a serious deterrent to riding, especially for low-income riders or those with particularly expensive or rare bicycles. Where a cyclist's needs falls on this spectrum is determined by several factors:

- **Type of trip being made:** whether or not the bicycle will be left unattended all day or just for a few minutes.
- **Security of area:** determined by the cyclist's perception
- **Value of the bicycle:** the more a cyclist has invested in a bicycle, the more concern she or he will show for theft protection or how prone a given area is to bicycle theft.

A final need for some potential commuting cyclists are shower, locker, and changing rooms at trip destinations. For those cyclists needing to dress more formally, travel longer distances, or cycle during wet or hot weather, the ability to shower and change clothing can be as critical as bicycle storage.

6.2.9. *Types of Bicycle Parking*

Bicycle parking facilities in California are classified as follows:

Class I: Class I bicycle parking facilities (see Figure 6.9) accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking is to be provided in a secure, weather-protected manner and location. Class I bicycle parking will be either a bicycle locker, or a secure area like a 'bike corral' that may be accessed only by bicyclists.

Bike lockers are covered storage units that typically accommodate one or two bicycles per locker, and provide additional security and protection from the elements. These are typically located at large employment center, colleges, and transit stations.

Bike corrals can be found at schools, stadiums, special events, and other locations, and typically involve a movable fencing system that can safely store numerous bicycles. Either locking the enclosure or locating it near other activities so that it can be supervised provides security.

Class II: Class II bicycle parking facilities (see Figure 6.10) 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. Class II racks are typically located on sidewalks. Due to narrow sidewalk widths in many areas, interest has been increasing in on-street bicycle parking, sometimes in place of car parking

spaces (see Figure 6.11 for an example). Note that on-street bicycle parking is an atypical design for Class II bicycle parking for which there are currently no nationally-accepted design guidelines.

6.2.10. *Parking Facility Placement*

Bicycle parking facilities should be placed in convenient locations close to building entrances to promote use. Facilities should be no farther from the main entrance than the closest auto parking, and within 50 feet of a main entrance to the building.

Directional signage should be used to locate bicycle parking areas when they are not visible from the street.

Table 6-1. Suggested Guidelines for Bicycle Parking Locations and Quantities

Land Use or Location	Physical Location	Bicycle Capacity
City Park	Adjacent to restrooms, picnic areas, fields, and other attractors	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 r pedestrian movement	2 bicycles every 200 feet
Transit Stations	Near platform or security guard	1 bicycle per 30 parking spaces

Figure 6.9: Class I Bike Lockers

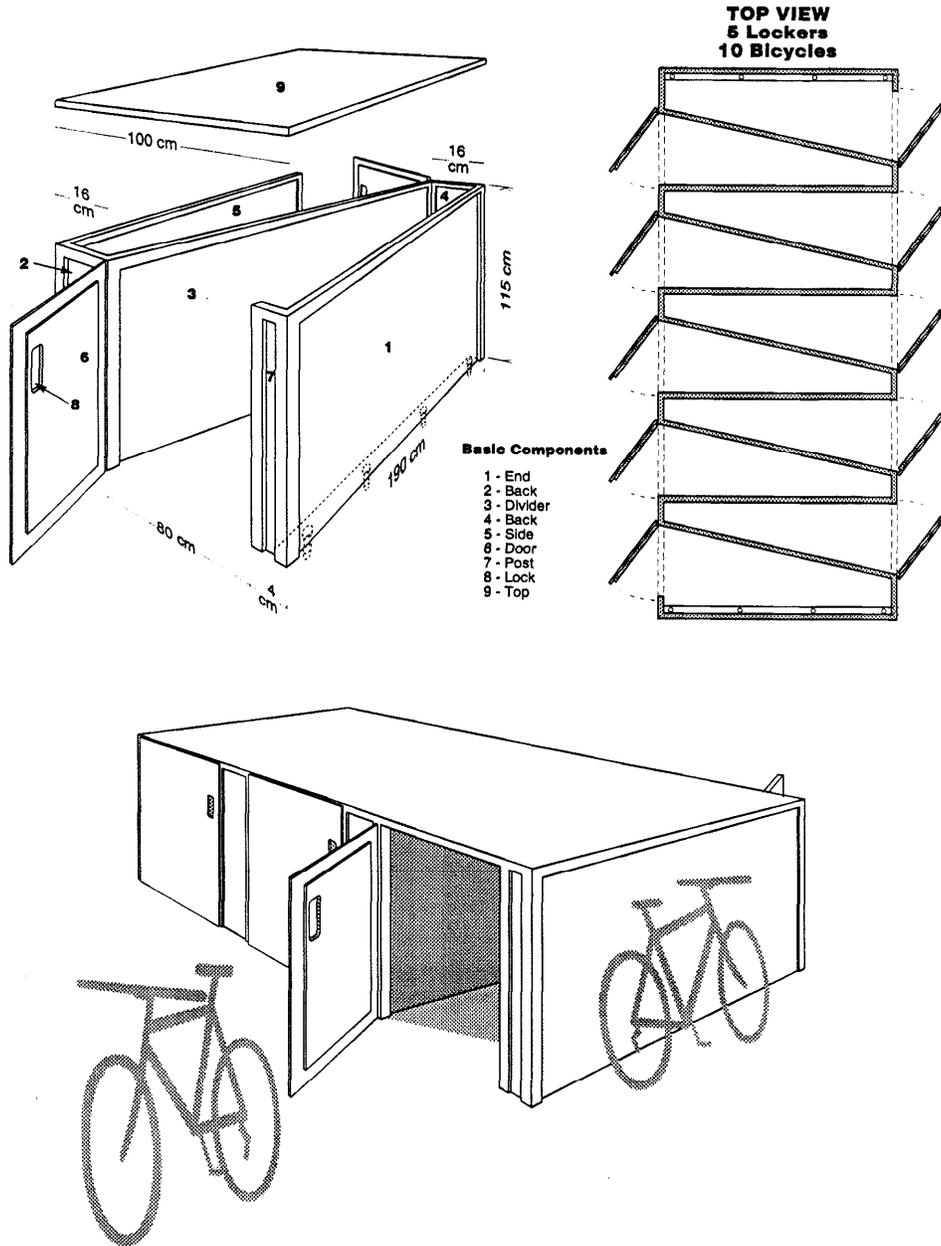


Figure 6.10: Class II Racks

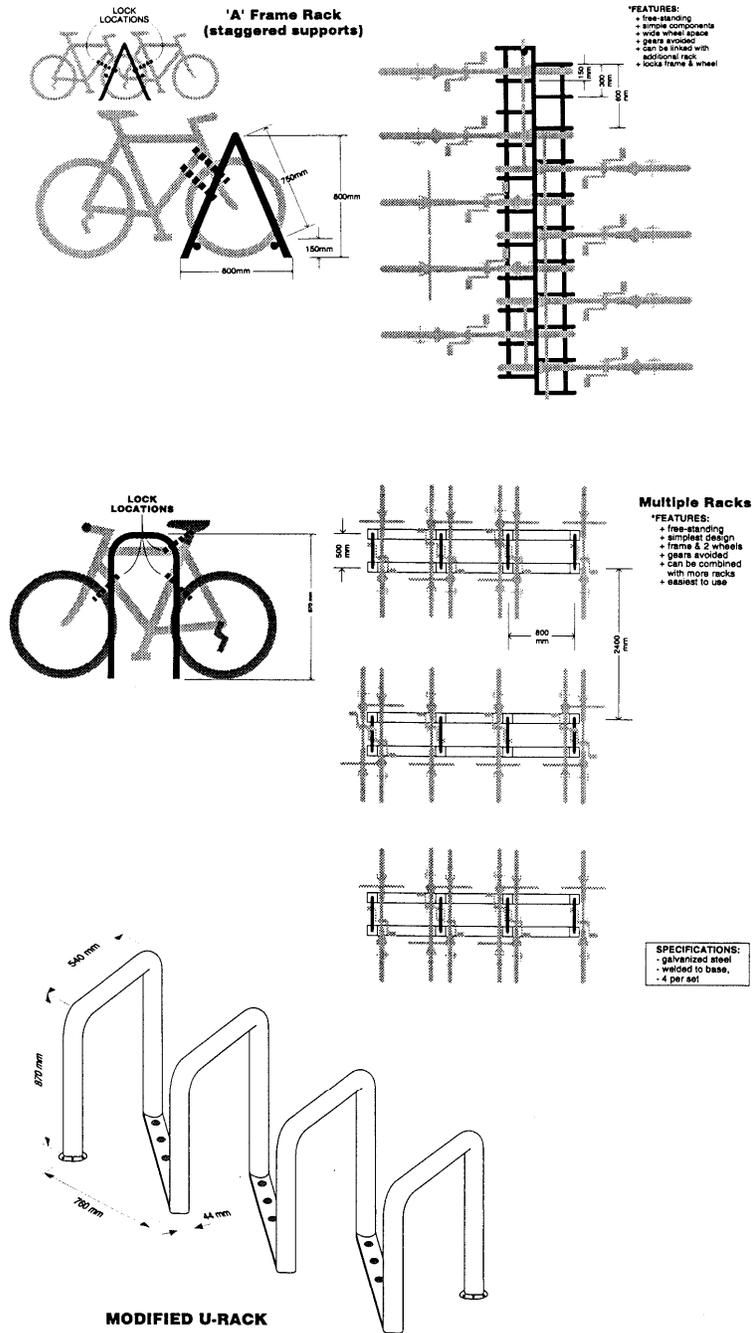
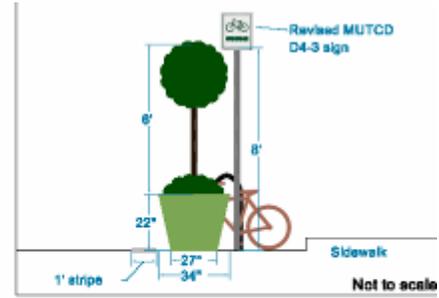


Figure 6.11

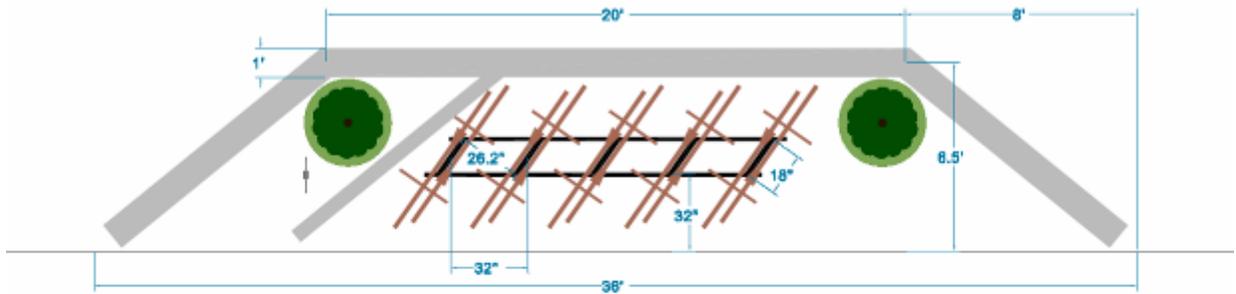
On-Street Bicycle Parking

Short-term Design

36' Option



Side Elevation



Plan

Scale: 1" = 4'

6.3. PEDESTRIAN FACILITY DESIGN GUIDELINES

6.3.1. *State and Federal Guidelines*

The design of many streetscape elements is regulated by state and federal law. Traffic control devices must follow the procedures set forth in the California Manual of Uniform Traffic Control Devices (CA MUTCD), while elements such as sidewalks and curb cuts must comply with guidelines implementing the Americans with Disabilities Act (ADA) and the California Building Code (Title 24).

6.3.2. *California Manual of Uniform Traffic Control Devices*

Mount Shasta follows the procedures and policies set out in the CA MUTCD. Traffic control devices include traffic signals, traffic signs, and street markings. The manual covers the placement, construction, and maintenance of devices. The CA MUTCD emphasizes uniformity of traffic control devices to protect the clarity of their message. A uniform device conforms to regulations for dimensions, color, wording, and graphics. Uniformity also means treating similar situations in the same way.

6.3.3. *Principles for Pedestrian Design*

The following design principles represent a set of ideals which should be incorporated, to some degree, into every pedestrian improvement. They are ordered roughly in terms of relative importance.

1. The pedestrian environment should be safe. Sidewalks, walkways, and crossings should be designed and built to be free of hazards and to minimize conflicts with external factors such as noise, vehicular traffic, and protruding architectural elements.
2. The pedestrian network should be accessible to all. Sidewalks, walkways, and crosswalks should ensure the mobility of all users by accommodating the needs of people regardless of age or ability.
3. The pedestrian network should connect to places people want to go. The pedestrian network should provide continuous direct routes and convenient connections between destinations, including homes, schools, shopping areas, public services, recreational opportunities and transit.
4. The pedestrian environment should be easy to use. Sidewalks, walkways, and crossings should be designed so people can easily find a direct route to a destination and will experience minimal delay.
5. The pedestrian environment should provide good places. Good design should enhance the look and feel of the pedestrian environment. The pedestrian environment includes open spaces such as plazas, courtyards, and squares, as well as the building facades that give shape to the space of the street. Amenities such as seating, street furniture, banners, art, plantings, shading, and special paving, along with historical elements and cultural references, should promote a sense of place.

6. The pedestrian environment should be used for many things. The pedestrian environment should be a place where public activities are encouraged. Commercial activities such as dining, vending, and advertising may be permitted when they do not interfere with safety and accessibility.
7. Pedestrian improvements should preserve or enhance the historical qualities of a place. Mount Shasta's history must be preserved in the public space. Where applicable, pedestrian improvements should restore and accentuate historical elements of the public right-of-way. Good design will create a sense of time that underscores the history of Mount Shasta.
8. Pedestrian improvements should be economical. Pedestrian improvements should be designed to achieve the maximum benefit for their cost, including initial cost and maintenance cost as well as reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce, and connect with adjacent private improvements.

6.3.4. *ADA Compliance*

ADA compliance is required for each aspect of the pedestrian system (e.g., sidewalks, curb ramps, crossing treatments, and signal actuation). Standards change with some frequency so it is recommended that design guidelines and standards be periodically checked and updated against Title 24, and ADA Accessibility Guidelines (ADAAG). California law states that the more stringent set of guidelines shall apply. Current suggested standard details from Caltrans are included in Appendix D.

6.3.5. *Sidewalk Corridor Guidelines*

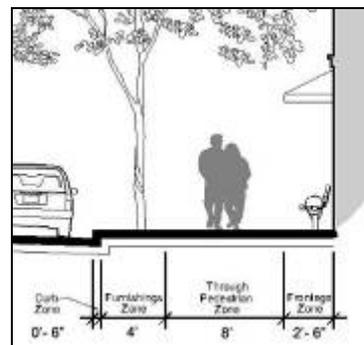
The width and zone guidelines presented in this sidewalk section would apply to sidewalks in new development areas, redevelopment areas, and in areas where street reconstruction is planned. For the entire above listed project types, sufficient right of way must exist for implementation of the appropriate sidewalk width guideline.

Sidewalk Corridor Width

Proposed sidewalk guidelines apply to new development and depend on available street width, motor vehicle volumes, surrounding land uses, and pedestrian activity levels. Standardizing sidewalk guidelines for different areas of the City, dependent on the above listed factors, ensure a minimum level of quality for all sidewalks.

Mount Shasta currently installs sidewalks that conform to the Americans with Disabilities Act Accessibility Guidelines (ADAAG) that call for minimum 4-foot wide sidewalks for passage.

The Institute of Transportation Engineers (ITE) recommends planning all sidewalks to include a minimum width of 5 feet (60 inches) with a planting strip of 2 feet (24 inches) in both residential and commercial areas.



6.3.6. Sidewalk Zones

Sidewalks are the most important component of Mount Shasta’s pedestrian circulation network. Sidewalks provide pedestrian access to virtually every activity and provide critical connections between other modes of travel, including the automobile, public transit, and bicycles. The Sidewalk Corridor is typically located within the public right-of-way between the curb or roadway edge and the property line. The Sidewalk Corridor, shown in Figure 6.10 contains four distinct zones: the Curb Zone, the Furnishings Zone, the Through Pedestrian Zone, and the Frontage Zone.

6.3.7. Curb Zone

Curbs prevent water in the street gutters from entering the pedestrian space, discourage vehicles from driving over the pedestrian area, and make it easy to sweep the streets. In addition, the curb helps to define the pedestrian environment within the streetscape, although other designs can be effective for this purpose. At the corner, the curb is an important tactile element for pedestrians who are finding their way with the use of a cane. Straight curbs rather than rolled curbs are strongly recommended because it eliminates the potential for cars to park on the sidewalk or partially obstructing the sidewalk.

6.3.8. Furnishings Zone

Most streets require a utility zone to accommodate above ground public infrastructure, signage, and street trees. Locating this infrastructure in the furnishings zone prevents it from encroaching on the through passage zone, where it is likely to cause accessibility issues. The furnishings zone also creates an important buffer between pedestrians and vehicle travel lanes by providing horizontal separation. Elements like utility poles, sign posts, and street trees improve pedestrian safety and comfort by further separating the sidewalk from moving vehicles. Guidelines for furnishings zone widths are presented below in Table 6.2.

6.3.9. Through Passage Zone

Most residential areas outside the downtown area in Mount Shasta are low to medium density and therefore have lower pedestrian volumes, compared to more urbanized areas such as the downtown and adjacent neighborhoods. A four to five foot minimum through passage zone is recommended for these conditions, depending on available right of way. Some commercial areas, school zones, and other public areas generate greater pedestrian volumes and should have a wider through zone. Table 6.2 presents recommended standards for the through zone width for each of the predominant land uses in Mount Shasta.

6.3.10. Frontage Zone

The frontage zone is the space between the pedestrian through zone and the adjacent property line. Pedestrians tend to avoid walking close to barriers at the property line, such as buildings, storefronts, walls or fences, in the same way that they tend to avoid walking close to the roadway. In most cases the frontage zone should be at least 12 inches. However, if the sidewalk is adjacent to a wide open or landscaped space, such as in residential areas where fences are not typically found or not allowed, the frontage zone can be eliminated. Guidelines for frontage zone widths are presented below in Table 6.2. As shown in the Table 6-2, a frontage zone may not be required in many residential areas of Mount Shasta due to lack of public right of way or deep yard setbacks.

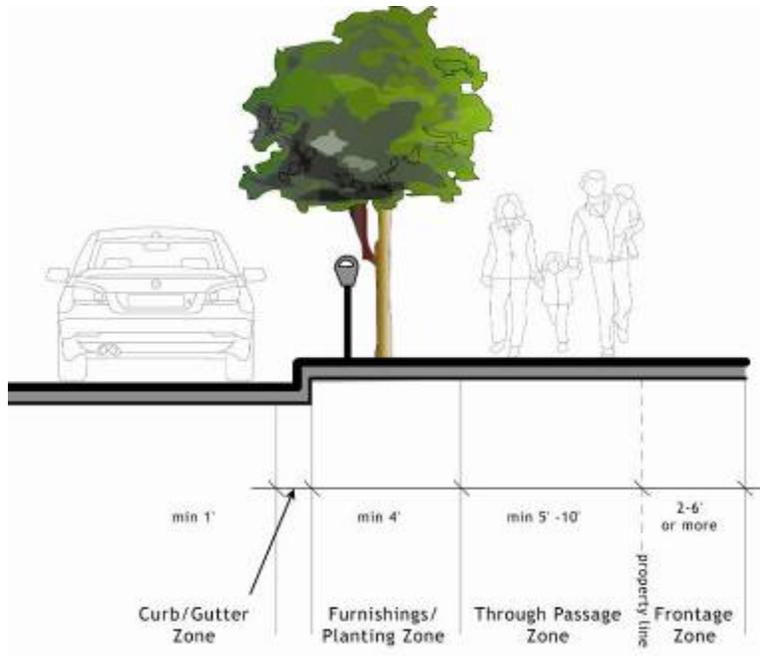


Figure 6.10: Sidewalk Zones

Table 6.2. Recommended Minimum Zone Widths By Street Type

Street Type	Curb Zone	Utility Zone (Buffer Zone)	Through Passage Zone	Frontage Zone	Total Sidewalk Width
Arterial and Collector Street	1 ft.	2-4 ft.	5-8 ft.	2 ft.	10-15 ft.
Local Neighborhood Street	0-1 ft.	0-2 ft.	4-5 ft.	none	4-8 ft.
Commercial Walkways	1 ft.	2-4 ft.	8-10 ft.	2 ft.	13-17 ft.
Multi-Use Trail	NA	4 ft. graded soft surface (2 ft. either side)	8-10 ft. (two-way travel)	NA	12-14 ft.

6.3.11. Sidewalk Cross Section Examples

Basic sidewalk cross-section examples are presented on the following pages. These recommendations consist of both prototype and site-specific types and are intended to complement existing local and Caltrans roadway standards and the design guidelines provided above.

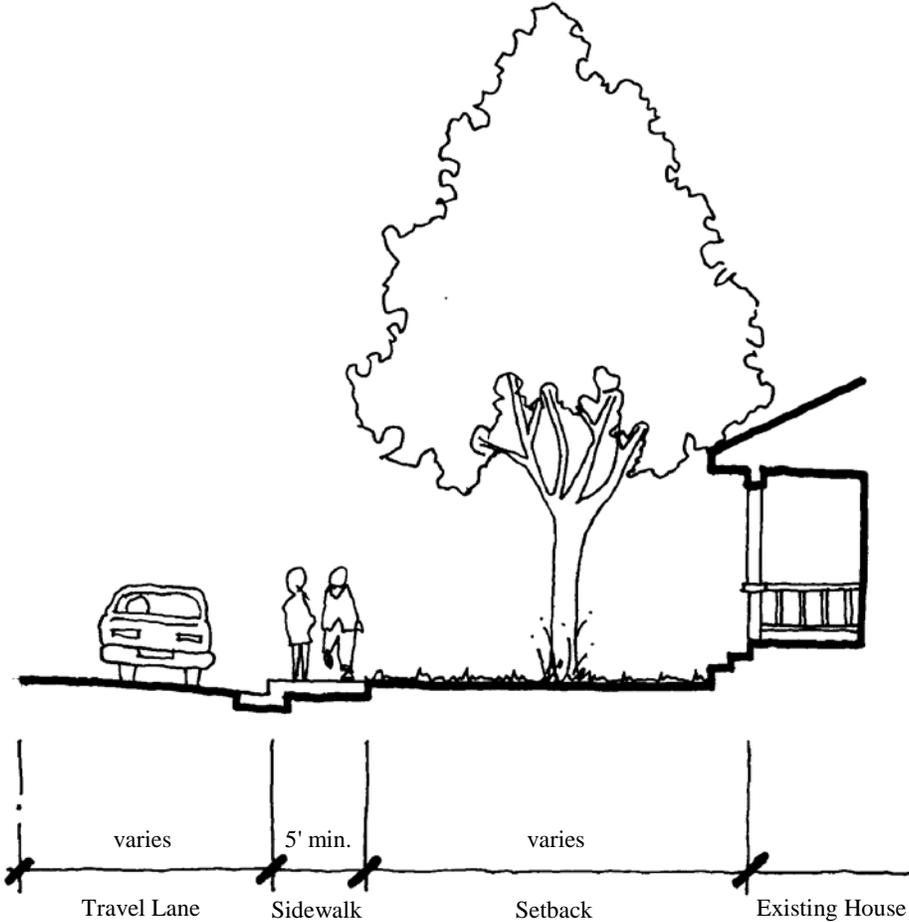
New Sidewalks in Residential Neighborhoods

Although not every neighborhood may desire sidewalks, there will be places that could benefit from their installation. Safer trips by schoolchildren, shopping trips and recreation are just some of the reasons that a community may wish to see sidewalks built in one of their existing neighborhoods.

Sidewalks on Narrow Streets

Figure 6.11 shows the minimal solution for new sidewalks in existing neighborhoods. It shows a site constrained by a small setback to the existing house or significant landscaping and a narrow street condition that does not allow for a parking lane between the pedestrians on the sidewalk and the vehicular travel lane.

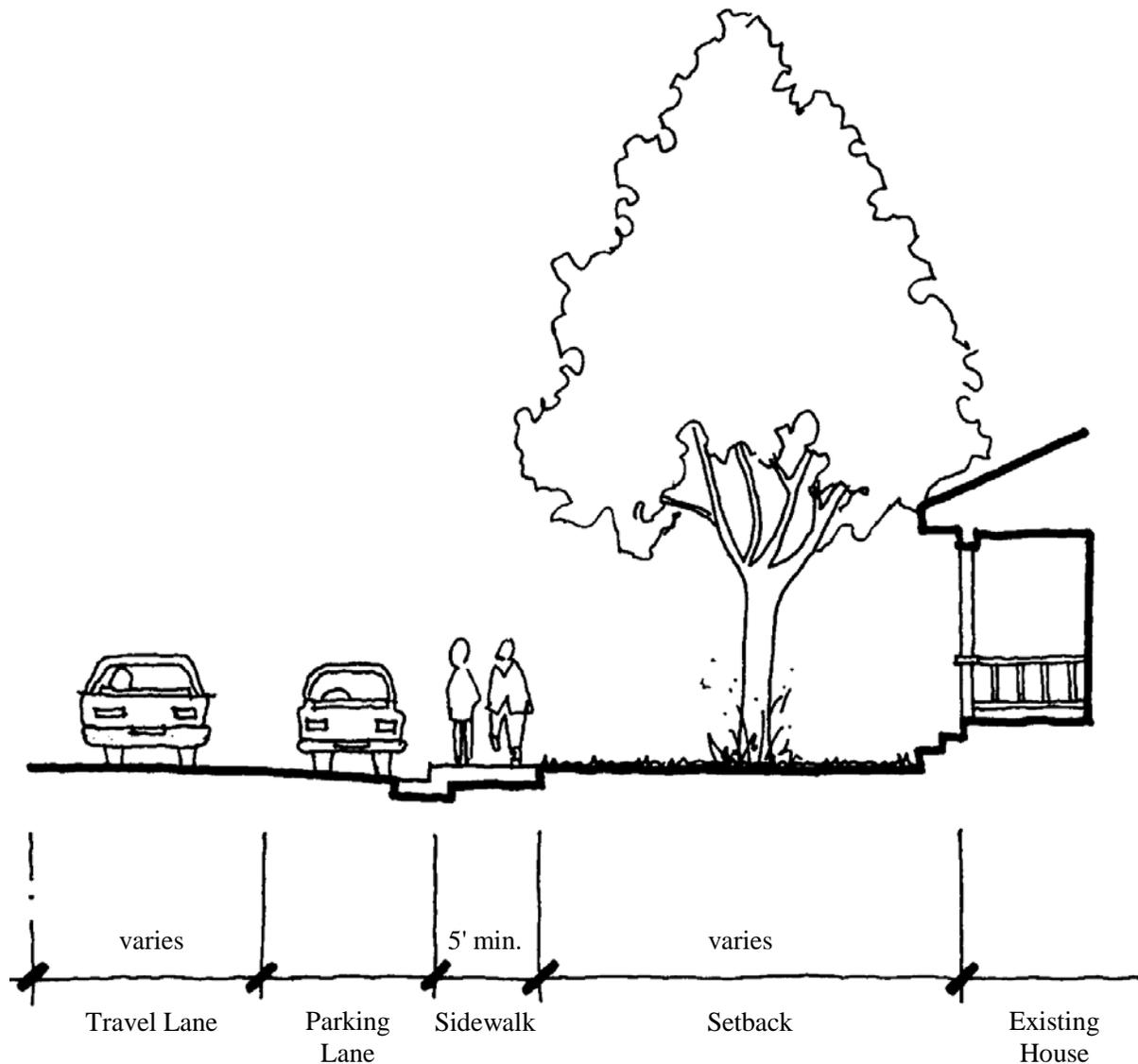
Figure 6.11: Sidewalks on Narrow Streets



Sidewalks on Wider Streets

Figure 6.12 demonstrates the preferred design where a lane of parking between the pedestrian way and the traffic lane. A parking lane is generally preferred for pedestrian safety since it separates pedestrians from moving cars. If the street is not wide enough to install this improvement, and the existing house or landscaping is set back far enough, the possibility of acquiring land to widen the right-of-way should be investigated.

Figure 6.12: Sidewalks on Wider Streets

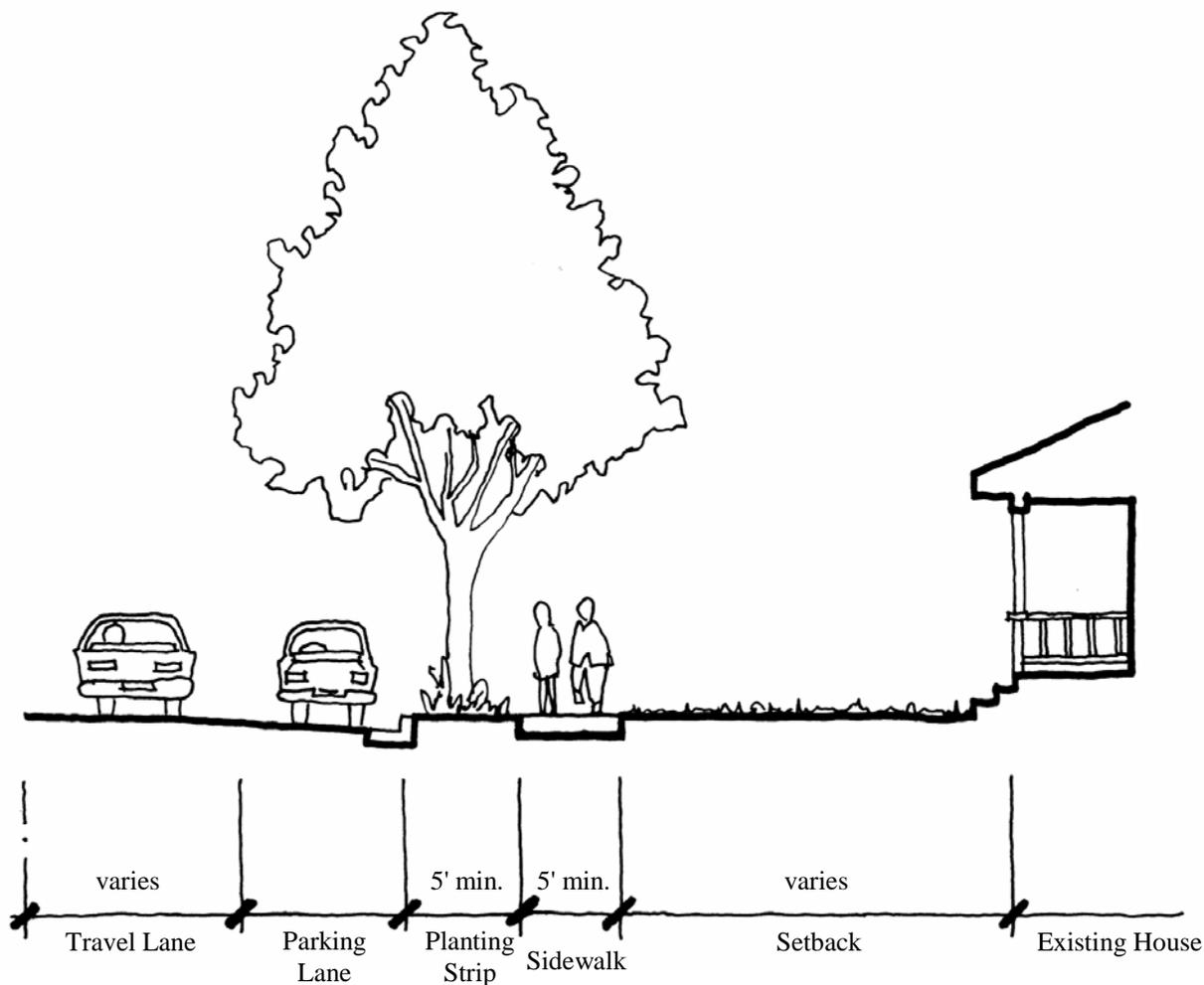


Sidewalk with Planting Strip

The most desirable condition, as illustrated here, is for the pedestrian to be buffered from vehicular traffic by both a parking lane and a planting strip. This is particularly important on streets with higher traffic volumes. Ideally, the planting strip should contain street trees at an interval of 20 to 50 feet on center. The trees help to create a more amenable pedestrian corridor and give better spatial definition to the street. This can make the street appear narrower, which helps to slow vehicular traffic.

If the street is not wide enough to install this improvement, and the existing house or landscaping is set back far enough, the possibility of acquiring land to widen the right-of-way should be investigated. This corresponds roughly to the existing Separated Sidewalk standard, but allows for greater variation in planter strip width.

Figure 6.13: Sidewalk with Planting Strip



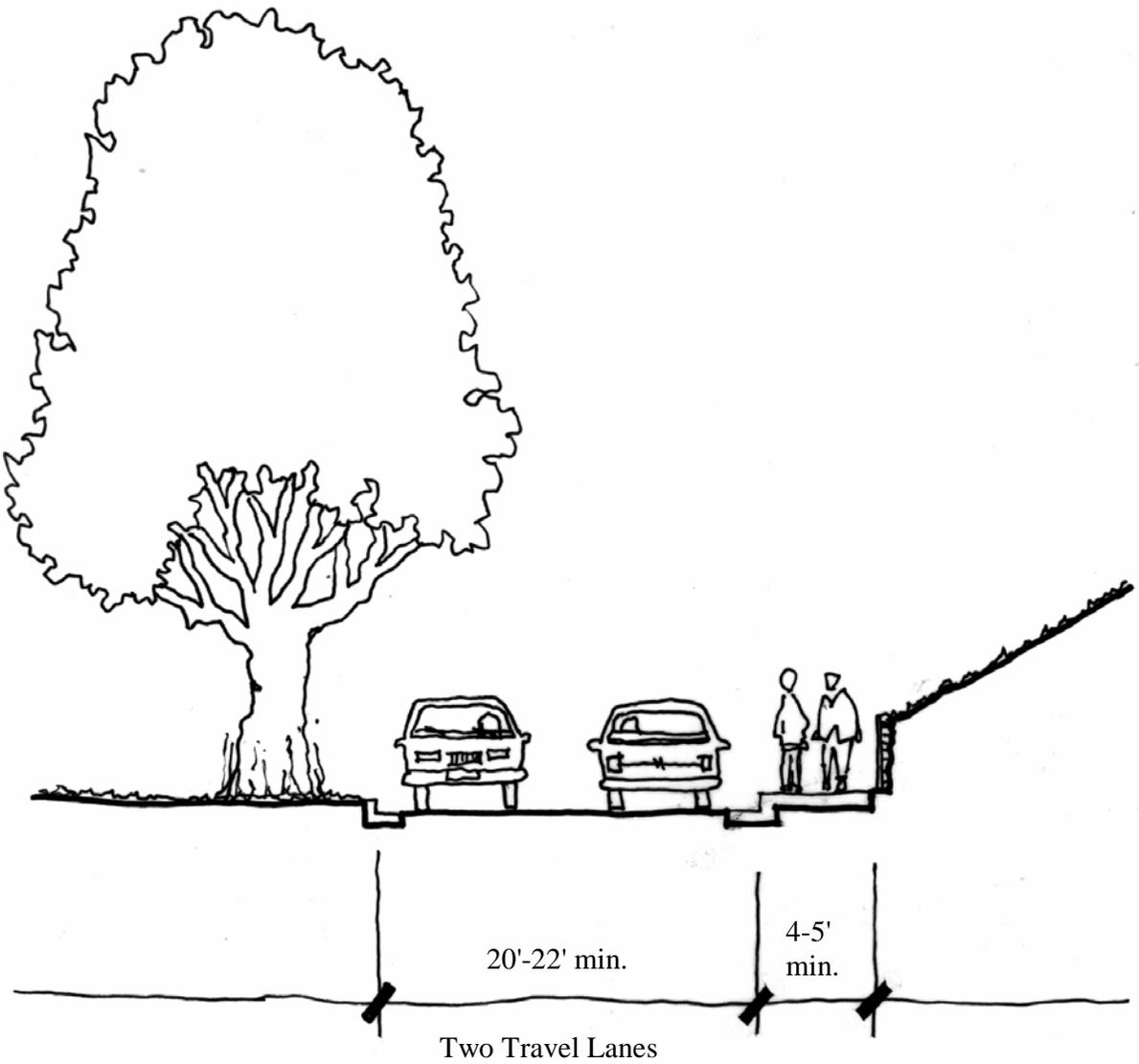
6.3.12. *Pedestrian Facilities on Constrained Residential Streets*

Some neighborhoods in Mount Shasta have severe constraints that prevent the installation of sidewalks. Such constraints would include the topography immediately adjacent to one or both sides of the street, significant trees or landscape features, small front yard setbacks and/or right-of-way limitations. This section shows various options for addressing pedestrian safety on these streets.

Sidewalk in Cut Slope Area

One option, as shown below, is to install a retaining wall along a hillside in order to provide preferably five feet, but minimally four feet for sidewalk access. Other topographical barriers could be overcome using similar soil retaining methods.

Figure 6.14: Sidewalk in Cut Slope Area



6.4. CROSSWALKS

6.4.1. *Definition*

The California Vehicle Code, Section 275 defines a crosswalk as either:

- “That portion of a roadway included within the prolongation or connection of the boundary lines of sidewalks at intersections where the intersecting roadways meet at approximately right angles, except the prolongation of such lines from an alley across a street.”
- Or “any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface.”

The Vehicle Code further states, “Notwithstanding the foregoing provisions of this section, there shall not be a crosswalk where local authorities have placed signs indicating no crossing.”

At intersections, a crosswalk is effectively a legal extension of the sidewalk across the roadway. Crosswalks are present at all intersections, whether marked or unmarked, unless the pedestrian crossing is specifically prohibited by the local jurisdiction. At mid-block locations, crosswalks only exist if they are marked.

According to the California MUTCD, crosswalk markings provide guidance for pedestrians who are crossing roadways by defining and delineating paths on approaches to and within signalized intersections, and on approaches to other intersections where traffic stops. Crosswalk markings also serve to alert road users of a pedestrian crossing point across roadways not controlled by highway traffic signals or STOP signs. At non-intersection locations, crosswalk markings legally establish the crosswalk.

As noted in the FHWA report “Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations,” the California MUTCD does not provide specific guidance relative to the site condition (e.g., traffic volume, pedestrian volume, number of lanes, presence or type of median) where marked crosswalks should or should not be used at uncontrolled locations. Nor does the MUTCD give specific guidance on the application of crosswalk enhancement features such as high-visibility striping, advanced warning signage, or flashing beacons. While the California MUTCD allows the use of these devices, decisions on their specific applicability to a given location have historically been left to the judgment of the local traffic engineers. This section summarizes the various types of crosswalk-related markings, signage and enhancement treatments available for use in Mount Shasta, discusses policies and procedures already in use for implementation of some of these devices, and provides more specific guidance and recommendations to assist Town traffic engineers with future implementation.

6.4.2. *Crosswalk Markings*

Marked crosswalks serve to alert road users to expect crossing pedestrians and to direct pedestrians to desirable crossing locations. Mount Shasta utilizes the standard style, consisting of two parallel lines.

Crosswalks should extend across the full width of intersections, or to the edge of the intersecting crosswalk, to encourage pedestrians to cross perpendicular to the flow of traffic. Crosswalk

markings can be applied with paint, thermoplastic, or reflective thermoplastic tape. At controlled crosswalk locations (STOP signs or traffic signals), crosswalk markings by themselves are considered sufficient treatment, given the presence of a traffic control to stop vehicles. At uncontrolled crosswalk locations (either uncontrolled intersections or mid-block locations), marked crosswalks can be enhanced with crosswalk signage, advance warning signage, in-pavement flashers, or flashing beacons -- these additional crosswalk enhancements are discussed in more detail below.

Table 6.3: Crosswalk Markings

Style	Sample
<p>Standard – Two solid white lines, 12 to 24 inches wide, spaced at least 6 feet apart (refer to CA MUTCD Sec. 3B.17). Also called “transverse.”</p>	
<p>Ladder – Adds cross bar “rungs” to the standard crosswalk marking described above. Width of ladder lines should be 1 foot, with minimum spacing of ladder lines 1-5 feet.</p>	
<p>School Crosswalks. Crosswalks within the designated school zone must be painted yellow, per California MUTCD. Can be marked either standard or ladder. The school zone can be set a distance up to 500 feet from the school boundary.</p>	

The decision on whether to install standard or ladder crosswalk markings depends upon a variety of factors such as the number of pedestrians crossing, traffic speeds/volumes, number of lanes to cross, presence of nearby schools or senior centers, and history of collisions. In general, standard transverse markings are considered appropriate at controlled intersections, minor uncontrolled

intersections, and other crossing locations with low traffic volumes/speeds, short crossing distance, and good visibility. High visibility ladder markings are generally applied at uncontrolled or mid-block locations, especially on major streets with high pedestrian volumes, heavy traffic volumes and speeds, and more than one lane each direction.

6.4.3. Pedestrian Warning Signage for Signalized Intersections

As noted under the discussion of crosswalk signs and markings, crosswalk warning signs are not permitted at crosswalks controlled by a traffic signal, as the traffic control itself serves to regulate vehicles at the intersection. At signalized intersections, particularly where right turn on red is permitted, installing stop lines as described above may be one way of reducing encroachment of vehicles into the pedestrian crosswalk. Another solution to remind drivers who are making turns to yield to pedestrians is installation of a “TURNING TRAFFIC MUST YIELD TO PEDESTRIANS” (R10-15) sign.

6.4.4. Flashing Beacons

Where the visibility of a crosswalk is poor, or where warranted by safety considerations, yellow flashing beacons can be installed to alert motorists to expect crossing pedestrians. Beacons can either be mounted on posts on the side of the roadway, or installed on mast arms over the roadway. Beacons can be installed in conjunction with any crosswalk warning sign, and can be set to operate at all times where the level of pedestrian activity along a corridor warrants. When installed at a specific crosswalk location, beacons can be set to be activated by pedestrians to only flash during the crossing time.

When used to make motorists aware of school zones, flashing beacons should be timed to flash only during the morning and afternoon school commute hours when children are present.

6.4.5. Special Crosswalk Pavement Treatments

For aesthetic reasons, crosswalks are sometimes constructed with distinctive paving materials such as colored pavement or special decorative pavers meant to look like brick. Brick should never be used in crosswalks, as it tends to wear down quickly, becoming uneven and slippery and causing difficulties for pedestrians, especially persons with disabilities. Any use of unique materials or colored pavement should use concrete pavers or asphalt, and textures should maintain a smooth travel surface and good traction. It is important to note that these decorative pavement treatments do not enhance the visibility of the crosswalk location, in many cases make the crossing more difficult for persons with disabilities to navigate, make the crosswalk less visible to motorists at night, and for these reasons are not recommended. Regardless of any colored or unique pavement treatment used, marked crosswalk locations should always be marked with parallel transverse lines.

6.4.6. In-Roadway Warning Lights

The California MUTCD has approved the use of in-roadway warning lights at uncontrolled marked crosswalks. Also known as in-pavement flashing crosswalks, illuminated crosswalks, or “Santa Rosa lights,” these yellow lights embedded just above the roadway surface and flash when activated (either by a

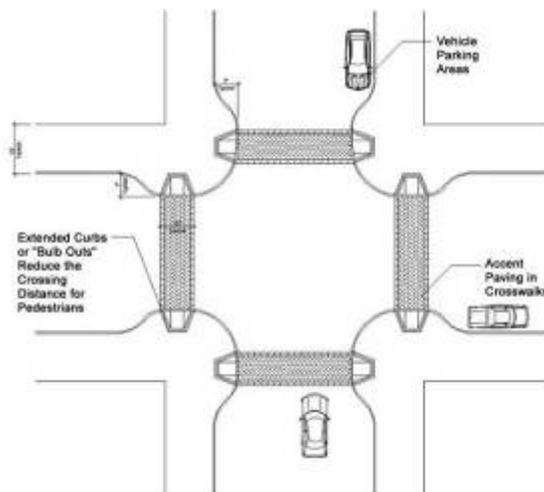


pushbutton or by passive detection) by a crossing pedestrian. The California MUTCD Sec. 4L.02 provides guidance on evaluating the need for in-roadway warning lights and offers standards for their placement. Mount Shasta currently has no in-roadway warning lights installed. These lights can wear quickly due to gravel placed on the street for traction during snow events.

6.5. ENGINEERING TREATMENTS FOR CROSSWALKS

6.5.1. Curb Extensions

Curb extensions, also called “bulb-outs” to describe their shape, are engineering improvements intended to reduce pedestrian crossing distance and increase visibility. Curb extensions can either be placed at corners or at mid-block crosswalk locations, and generally extend out about 6 feet to align with the edge of the parking lane. In addition to shortening the crosswalk distance, curb extensions serve to increase pedestrian visibility by allowing pedestrians to safely step out to the edge of the parking lane where they can see into the street, also making them more visible to oncoming drivers. At corners, curb extensions serve to reduce the turning radius, and provide space for perpendicularly-aligned curb ramps. Where bus stops are located, bulb-outs can provide additional space for passenger queuing and loading.



Despite their advantages, curb extensions can require major re-engineering of the street and are not appropriate for all situations. Installing curb extensions where there are existing storm drain catch basins can require costly drainage modifications. Curb extensions may not be possible in some locations due to existing driveways or bus pull-out areas. Curb extensions need to be designed to avoid conflict with bicycle facilities, and should never extend into a bicycle lane.

Given their relatively high cost and challenges of implementation, curb extensions are not recommended as a tool for widespread implementation in Mount Shasta. Each potential curb extension location must be evaluated on a case-by-case basis, taking into account factors such as crossing volumes, parking lane widths, infrastructure challenges such as drainage or driveways, and locations of bus stops.

Curb extension installations in Mount Shasta should include a vertical element to alert plow drivers to their location. Reducing the width of the curb extension to fall just inside the edge of the parking lane will allow the plow to remove snow from the entire travel lane in a single pass.

Medians/Refuge Islands

Medians are elevated or delineated islands that break up non-motorized street crossings into multiple segments. Where shared roadways intersect major streets at unsignalized intersections, medians can be used to simplify bicyclist and pedestrian crossings on the major street. Appropriate signage should be installed on the major street to warn motorists of bicyclist/pedestrian crossings.

Additionally, vegetation within the median should be low to maintain adequate sight distances for both motorists and bicyclists/pedestrians. Medians can also be used along the bicycle boulevard to create a visual pinch point for motorists as well as to accommodate mid-block bicycle/pedestrian crossings. Median/Refuge Island installations in Mount Shasta should include a vertical element to alert plow drivers to their location.

6.5.2. *Traffic Signal Enhancements*

This section discusses specific pedestrian enhancements for use at signalized intersection locations.

Pedestrian Pushbutton Detectors

Pedestrian pushbutton detectors allow for actuation of pedestrian signals, and should be located at all intersection corners where pedestrian actuation is used. As required by the California MUTCD, pedestrian pushbutton detectors must be accompanied by signs explaining their use. Pedestrian pushbutton detectors should be easily accessible for those in wheelchairs and for the sight-impaired, located approximately 3.5 ft. off the ground on a level surface. Pedestrian pushbuttons should not be used in locations where the pedestrian phase is set on a fixed cycle and cannot be actuated. One exception to this is the use of pushbuttons to activate audible pedestrian signals at non-actuated locations.

Table 6.4: Pedestrian Signal Actuation

PEDESTRIAN SIGNAL ACTUATION



There are several simple design considerations that greatly enhance the safety and comfort of pedestrians at signalized intersections:

- In areas with high pedestrian use (over 100 persons per hour), incorporate a pedestrian phase into the signal sequence instead of an on-demand signal phase,
- Alternatively, install countdown pedestrian signals instead of the traditional “flashing hand” signal. This communicates to the pedestrian exactly how much time they have to cross the road safely.
- Place pedestrian push-buttons in locations that are easy to reach and ADA compliant, facing the sidewalk and clearly inline with the direction of travel (this will improve operations, as many pedestrians push all buttons to ensure that they hit the right one);
- Place additional actuators prior to the intersection so that pedestrians may activate the signal before they reach the corner of the intersection, to decrease pedestrian waiting time;
- Adjust the signal timing to accommodate the average walking speeds of intersection users (longer crossing times for intersections near schools and community centers, etc.), or to limit the time a pedestrian has to wait.

ACCESSIBLE PEDESTRIAN SIGNALS – VERBAL/VIBROTACTILE TONE



- When verbal messages are used to communicate the pedestrian interval, they shall provide a clear message that the walk interval is in effect, as well as to which crossing it applies.
- The verbal message that is provided at regular intervals throughout the timing of the walk interval shall be the term “walk sign,” which may be followed by the name of the street to be crossed.
- A verbal message is not required at times when the walk interval is not timing, but, if provided:
 1. It shall be the term “wait.”
 2. It need not be repeated for the entire time that the walk interval

Accessible pedestrian signals that provide verbal messages may provide similar messages in languages other than English, if needed, except for the terms “walk sign” and “wait.” A vibrotactile pedestrian device communicates information about pedestrian timing through a vibrating surface by touch.

- Vibrotactile pedestrian devices, where used, shall indicate that the walk interval is in effect, and for which direction it applies, through the use of a vibrating directional arrow or some other means.

6.6. TRAFFIC CALMING

Traffic calming interventions slow traffic by modifying the physical environment of a street. A variety of traffic calming measures are available including speed humps, chokers, traffic circles and both full and partial street closures. In addition, speed limit reductions may be effective, with or without physical traffic calming improvements at reducing speeds.

Research into the efficacy of traffic calming devices to improve pedestrian safety has shown that traffic calming can reduce the number of automobile collisions. A Vancouver study published in 1997 showed an average collision reduction of 40 percent in four neighborhoods that used a combination of the traffic calming types described below.³ Care should be taken in the design and placement of traffic calming elements in order to ensure compatibility with snow removal. Many snowy cities including Saskatoon, SK; Mammoth, CA; New York City, NY; Concord, NH and Vancouver, BC regularly implement these features.

Table 6.5: Traffic Calming Measures

Traffic Calming Measure	Description	Considerations for Use
Street Trees		
	<p>In addition to their aesthetic value, street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street’s visual corridor, which may cause drivers to slow down.</p>	<ul style="list-style-type: none"> - If the sidewalk corridor is not wide enough to accommodate street trees, adding tree plantings in the parking lane is possible, knowing that these trees have shortened life spans. - The placement of plantings should consider potential for conflict with street sweeping and drainage.
Raised Crosswalks		
	<p>Raised crosswalks are similar to speed humps, but are installed at intersections to elevate crosswalks. Raised sidewalks eliminate grade changes from the pedestrian path and give pedestrians greater prominence as they cross the street.</p>	<ul style="list-style-type: none"> - Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway. - May be designed so they do not have a slowing effect (for example, on emergency response routes). - Sinusoidal speed hump design should be used in snowy areas as they are compatible with snow removal operations.

³ Zein, S. R.; Geddes, E.; Hemsing, S.; Johnson, M., “Safety Benefits of Traffic Calming,” Transportation Research Record Vol: #1578 pp. 3-10

Chicanes



Chicanes are a series of curb extensions or narrowings that create an S-shaped route, causing traffic to slow down. An example of chicanes can be found on Milvia Street in North Berkeley, pictured at left.

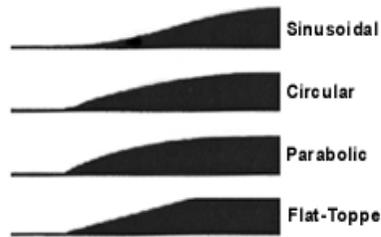
- With no major pedestrian issues, chicanes can provide additional landscaping and street buffer area. Care should be taken to ensure that chicanes do not affect bicycle mobility along streets proposed for chicanes.
- Chicane installations should include a vertical element as a visibility aid for snow plows.

Speed Humps



Speed humps are elevated, sloped sections of pavement that require drivers to slow down as they pass over.

Speed humps are generally 12-22 feet long and 3-4 inches high. There are four speed hump shapes – sinusoidal, circular, parabolic and flat-topped – which differ in the shape of their slope. The sinusoidal shaped are much smoother to drive over at the intended speed, and are also more friendly to bicyclists. (Many older speed humps are of the parabolic shape, which provides a more pronounced bump when driving over them.)



- Not recommended for use on emergency response routes or transit corridors.
- Sinusoidal speed humps are recommended for high snow locations as they are compatible with snow removal operations.
- Advance warning signs will help alert plow driver to the location of speed humps

Traffic Calming Circles



Traffic calming circles are circular islands in the middle of an intersection. Traffic circles slow traffic by altering the route of vehicles and by reducing the distance a driver can see down the street, which also causes traffic to slow.

Traffic circles can either be two-way or four-way stop or yield.

- Unlike full roundabouts, traffic circles maintain the crosswalks at the intersection corners.

- However, in some cases it was necessary to move the crosswalks back to accommodate the turning radius of larger vehicles around the circle. In these cases the crosswalks are no longer aligned directly perpendicular with the corner, which could cause difficulty for persons with visual impairments.

Care should be taken to ensure that any landscaping in the circles uses low-growing shrubs that maintain visibility for pedestrians, particularly those in wheelchairs.

- Traffic calming circles should include a vertical element as a visibility aid for snow plows.

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CHAPTER 7. Implementation Strategy

This chapter identifies steps towards implementation of the proposed facilities and programs of this plan, the estimated costs for the proposed improvements and strategies on funding and financing. It should be noted that the City of Mount Shasta has not spent money on bicycle related improvements within the last five years.

7.1. IMPLEMENTATION PROCESS

The steps between the network improvements and concepts identified in this Plan and the final completion of the improvements will vary from project to project, but typically include:

1. Adoption of the *2008 Mount Shasta Bicycle, Pedestrian, and Trails Master Plan* by the Mount Shasta City Council.
2. Preparation of a Feasibility Study involving a conceptual design (with consideration of possible alternatives and environmental issues) and cost estimate for individual projects as needed.
3. Secure, as necessary, outside funding and any applicable environmental approvals.
4. Consider the parking needs of businesses and residents in the development of new bicycle lanes through a thorough community engagement process
5. Approval of the project by the City Council, including the commitment by the latter to provide for any unfunded portions of project costs.
6. Completion of final plans, specifications and estimates, advertising for bids, receipt of bids and award of contract(s).
7. Construction of Project.

7.1.1. Infrastructure Project phasing

Once a proposed system has been identified, the greatest challenge is to identify the top priority projects that will offer the greatest benefit to bicyclists and pedestrians if implemented. The project prioritization in the following section was developed through a qualitative analysis based on stated priorities of the ATAC and City staff, priorities communicated by the public in public meetings and workshops, priorities from the *General Plan* and *Community Action Plan* and the criteria detailed below.

- Gap Closure – Does the project provide a new connection between major activity centers or on a major corridor that currently either does not exist or has convenience/safety issues? Does this close a critical gap or correct a bottleneck in the existing system?
- Safety Need – Does the project address a significant safety concern in a community as evidenced by collision data, field observations, and/or public perception and comments? Does this improvement or program fill an immediate need?
- Demand Patterns – Does the project serve a significant existing or potential demand, as evidenced by (a) counts or observed activity, (b) comments from the public, (c) connectivity

and proximity to major generators, and/or (d) projections from an acceptable demand model?

- Project Readiness – Are the key feasibility issues of the project (right-of-way, environmental impacts, engineering issues, cost issues, neighborhood support) understood and not expected to negatively affect or delay the project? Has any formal feasibility study, engineering or design been conducted? Does this project take advantage of current availability of funding and or suitable right of way?
- Continuity and service – Does the project provide new or significantly improved connectivity on established corridors or between major activity areas that does not currently exist or is not currently usable by the general public?
- Cost/Benefit analysis – Will the project provide the greatest benefit to users for the amount invested to build and maintain it?
- Multi-Modal Integration – Does the project provide enhanced connectivity to existing transit services?
- Trip Reduction – Is this project expected to significantly reduce vehicle trips and vehicle miles traveled?
- Community support – Has this project been identified by community members in the past?

It is important to remember that the lists of bikeway and pedestrian projects and programs are flexible concepts that serve as guidelines to those responsible for implementation. The project priorities, and perhaps even the overall system and segments themselves, may change over time as a result of changing usage patterns and implementation constraints and opportunities. Project prioritization is not meant as an absolute value, but rather as an indication of projects' relative importance only. These priorities should be considered a "living document". The Mount Shasta ATAC and City staff should review the project priorities on an annual basis to ensure that it reflects the most current priorities, needs, and opportunities for implementing the bikeway and pedestrian network in a logical and efficient manner., and that in particular the list takes advantage of all available funding opportunities and grant cycles. As projects are implemented and taken off the list, new projects should be moved up in status.

7.1.2. Bicycle Project Phasing

The bicycle projects are listed below, along with their recommended phasing (short, medium and long term). The prioritization matrix is included as Appendix E. The projects represent long term and short term plans for bicycle facilities. Many of the recommended projects are viable for implementation in the short term as they consist of lower cost solutions, such as bike lane striping and route signing. Longer term recommendations, such as construction of bike lanes on Washington Drive should happen in conjunction with future roadway repaving and reconstruction.

Short Term

- Class I Facilities: Rotary Trail, North 'B' Street/Birch Street Connector (this facility includes Class I and Class III treatments), East Castle Street to Birch Street Connector
- Class II Facilities: West and East Lake Street/Hatchery Lane, South and North Mount Shasta Boulevard

- Class III Facilities: Shasta Avenue, Ski Bowl Drive, Spruce Street, West and East Castle Street, Mountain View Drive, Sheldon Avenue, Mill Street, Chestnut Street, McCloud Avenue, Maple Street, Sisson Street, South A Street, Guadenzio Street (South A to South B), Cedar Street, North ‘B’ Street/Birch Street Connector (this facility includes Class I and Class III treatments), East Ivy Street, Orem Street, Smith Street

Medium Term

- Class I Facilities: City Park to Downtown Pathway, Shasta Avenue to North Mount Shasta Boulevard Pathway, East Castle Street to Sisson Meadow Connector Pathway, Spruce Street Connector
- Class II Facilities: Everitt Memorial Highway, Rockfellow Drive, West and East Alma Street

Long Term

- Class I Facilities: McCloud River Railroad Pathway, Southern Railway Connector Pathway, Cedar Street to Lassen Lane Connector, High School Connector Pathway
- Class II Facilities: Pine Street, Rockfellow Drive, D Street/Washington Drive, Ream Avenue, Spring Hill Drive

7.1.3. *Pedestrian Project Phasing*

The pedestrian projects are listed below, along with their recommended phasing (short, medium and long term). The prioritization matrix is included as Appendix E. The City may choose to further prioritize specific gaps for filling within these pedestrian priority corridors. That analysis is outside the scope of this Plan.

Short Term

- Pine Street, Chestnut Street, East and West Alma Street, Cedar Street, North and South Mount Shasta Boulevard (Sisson Street to East Ivy Street),

Medium Term

- East and West Lake Street, Rockfellow Drive, North Mount Shasta Boulevard (East Ivy Street to Hinkley Street), North Mount Shasta Boulevard (Mountain View Drive to Sisson Street)

Long Term

- D Street/ Washington Drive/Everitt Memorial Highway, North Mount Shasta Boulevard (Hinkley Street to Nixon Road), South Mount Shasta Boulevard (Bear Springs Road to Mountain View Drive)

7.2. COST BREAKDOWN

A breakdown of conceptual cost estimates for the recommended bicycle and pedestrian network detailed in this plan is presented in Tables 7.1 and 7.2 below. It is important to note the three following assumptions about the cost estimates. First, all cost estimates are highly conceptual, since

there is no feasibility or preliminary design completed, and second, the design and administration costs included in these estimates may not be sufficient to fund environmental clearance studies. In particular, pedestrian project cost estimates provided here would need to be further refined through project development because in most cases specific existing conditions (e.g., exact length of sidewalk gaps, presence or absence of curb ramps) are not known as of this writing. Due to their complexity, costs for the Class I pathways proposed here would need to be re-examined as a part of future planning and design studies, and are presented as a rough starting point only. Finally, cost estimates are a moving target over time as construction costs escalate quickly.

All the projects are recommended to be implemented on short-term, mid-term or long-term timelines, or as funding is available. The more expensive and complex projects may take longer to implement. In addition, many funding sources are highly competitive, and therefore impossible to determine exactly which projects will be funded by which funding sources. Timing of projects is also something difficult to pinpoint exactly, due to the dependence on competitive funding sources, timing of roadway and development, and the overall economy.

The funding section in this chapter outlines some of the local, regional, State and federal funding methods and resources for non-motorized transportation projects.

Table 7.1. Bicycle Project Cost and Phasing

Class I Facilities - Multi-Use Paths (Off-Street)						
Segment Name	Begin	End	Length	Short-term	Mid-term	Long-term
City Park to Downtown Pathway	West Alma Street	City Park	1.9	\$0	\$3,000,000	\$0
Southern Railway Connector Pathway (Option I)	City limits	West Alma Street	1.6	\$0	\$0	\$2,459,000
Southern Railway Connector Pathway (Option II)	City limits	West Alma Street	2.4	\$0	\$0	\$3,688,000
Rotary Trail	East Lake Street	East Alma Street	0.2	\$307,000	\$0	\$0
McCloud River Railroad Pathway	Union Pacific Railroad	City limits	1.3	\$0	\$0	\$1,998,000
Shasta Avenue to North Mount Shasta Boulevard Pathway	Shasta Avenue	North Mount Shasta Boulevard	0.3	\$0	\$461,000	\$0
High School Connector Pathway	Rockfellow Drive	McCloud Railroad	0.5	\$0	\$0	\$768,000
East Castle Alley Pathway	East Alma Street at East Castle Street	City Park to Downtown Pathway	0.1	\$0	\$154,000	\$0
East Castle Street to East Birch Street Connector	East Castle Street	East Birch Street	0.1	\$154,000	\$0	\$0

Class I Facilities - Multi-Use Paths (Off-Street)						
Segment Name	Begin	End	Length	Short-term	Mid-term	Long-term
Spruce Street Connector	East Alma Street	Rockfellow Drive	0.1	\$0	\$162,000	\$0
North B Street to Birch Street Connector	North B Street	Birch Street	Less than 0.1	\$62,000	\$0	\$0
Cedar Street to Lassen Lane Connector	Cedar Street	Lassen Lane	2.3	\$0	\$0	\$3,574,000
Total Option I				\$523,000	\$3,777,000	\$8,799,000
Total Option II				\$523,000	\$3,777,000	\$10,028,000
Total Class I Bicycle Pathways				Option I-\$13,099,000 Option II-\$14,333,000		

Base cost for installation of a typical Class I Bike lane is \$935,000/mi. Cost reflected in this table includes survey/design (12%), contingency (25%), major project cost (14%), administration (10%) and traffic control/mobilization (7%).

Class II Facilities - Striped Bicycle Lanes (On-Street)						
Segment Name	Begin	End	Length	Short-term	Mid-term	Long-term
East and West Lake Street/Hatchery Lane	City limits	Washington Drive	1.1	\$40,000	\$0	\$0
D Street/ Washington Drive/ Everitt Memorial Highway	Old McCloud Road	Shasta Avenue	1.3	\$0	\$9,000	\$39,000
Rockfellow Drive	East Ivy Street	City limits	1.1	\$0	\$0	\$19,000
East and West Alma Street	Cedar Street	Rockfellow Drive	0.6	\$0	\$22,000	\$0
North and South Mount Shasta Boulevard	City limits	Spring Hill Drive	2.8	\$102,900	\$0	\$0
Pine Street	West lake Street	City limits	0.8	\$0	\$0	\$29,000
Ream Avenue	City limits	South Mount Shasta Boulevard	0.7	\$0	\$0	\$26,000
Spring Hill Drive	North Mount Shasta Boulevard	City limits	1.6	\$0	\$0	\$59,000
				\$142,000	\$31,000	\$172,000
Total Class II Bicycle Lanes				\$345,000		

Base cost for installation of a typical Class II Bike lane is \$25,000/mi. Cost reflected in this table includes survey/design (12%), contingency (25%), administration (10%) and traffic control/mobilization (7%).

Class III Facilities - Signed Bicycle Routes (On-Street)						
Segment Name	Begin	End	Length	Short-term	Mid-term	Long-term
Shasta Avenue	Western terminus	Everitt Memorial Highway	0.5	\$14,000	\$0	\$0
Ski Bowl Drive	Rockfellow Drive	Shasta Avenue	0.3	\$8,000	\$0	\$0
East and West Castle Street	Maple Street	Sisson Meadows	0.2	\$5,000	\$0	\$0
East Ivy Street	North Mount Shasta Boulevard	Rockfellow Drive	0.3	\$8,000	\$0	\$0
Mountain View Drive	South Mount Shasta Boulevard	Old McCloud Road	0.2	\$5,000	\$0	\$0
Sheldon Avenue	South Mount Shasta Boulevard	D Street	0.2	\$5,000	\$0	\$0
Mill Street	Sisson Street	Maple Street	0.3	\$8,000	\$0	\$0
North B Street/Birch Street	McCloud Avenue	East Lake Street	0.2	\$5,000	\$0	\$0
Chestnut Street	McCloud Avenue	North Mount Shasta Boulevard	0.5	\$14,000	\$0	\$0
McCloud Avenue	South Mount Shasta Boulevard	Washington Drive	0.1	\$3,000	\$0	\$0
Maple Street	Mill Street	West Castle Street	0.2	\$5,000	\$0	\$0
Orem Street	South Mount Shasta Boulevard	Washington Street	0.3	\$5,000	\$0	\$0
Smith Street	South Mount Shasta Boulevard	D Street	0.3	\$5,000	\$0	\$0
Sisson Street	Mill Street	South Mount Shasta Boulevard	0.1	\$3,000	\$0	\$0
South B Street	Old McCloud Road	Gaudenzio Street	0.3	\$5,000	\$0	\$0
Gaudenzio Street	South A Street	South B Street	0.1	\$3,000	\$0	\$0
South A Street	Gaudenzio Street	McCloud Avenue	0.1	\$5,000	\$0	\$0
Cedar Street	Mount Shasta Elementary School	Northern terminus	0.5	\$14,000	\$0	\$0
				\$123,000	\$0	\$0
Total Class III Bicycle Routes				\$123,000		
Base cost for installation of a typical Class III Signed Bicycle Route is \$18,000/mi. Cost reflected in this table includes survey/design (12%), contingency (25%), administration (10%) and traffic control/mobilization (7%).						
Total cost of improvements by phase (Short/Mid/Long-Term)			Option I	\$788,000	\$3,808,000	\$8,971,000
			Option II	\$788,000	\$3,808,000	\$10,200,000
Total cost of bikeway network (complete buildout)			Option I – \$13,568,000			
			Option II – \$14,796,000			

Table 7.2. Pedestrian Project Cost and Phasing

Pedestrian Priority Corridors – Sidewalk Gaps						
Segment Name	Begin	End	Total Length of gaps (feet)	Short-term	Mid-term	Long-term
South Mount Shasta Boulevard	Bear Springs Road	Mountain View Drive	350	\$0	\$0	\$38,000
South Mount Shasta Boulevard	Mountain View Drive	Sisson Street	1,100	\$0	\$119,000	\$0
North and South Mount Shasta Boulevard	Sisson Street	East Ivy Street	1,000	\$108,000	\$0	\$0
North Mount Shasta Boulevard	East Ivy Street	Hinkley Street	2,200	\$0	\$238,000	\$0
North Mount Shasta Boulevard	Hinkley Street	Nixon Road	1,000	\$0	\$0	\$108,000
Pine Street	West Lake Street	I-5	1,000	\$108,000	\$0	\$0
East and West Lake Street	I-5	Washington Drive	500	\$0	\$54,000	\$0
Chestnut Street	McCloud Avenue	North Mount Shasta Boulevard	1,700	\$184,000	\$0	\$0
East and West Alma Street	Pine Street	Rockfellow Street	1,500	\$162,000	\$0	\$0
Rockfellow Drive	Everitt Memorial Highway	Adams Drive	1,000	\$0	\$108,000	\$0
D Street/ Washington Drive/ Everitt Memorial Highway	Old McCloud Road	Mount Shasta High School	5,280	\$0	\$0	\$570,000
Cedar Street	Mount Shasta Elementary School	Northern terminus	3,700	\$200,000	\$0	\$200,000
				\$762,000	\$519,000	\$916,000
Total Sidewalk Gap Filling					\$2,197,000	

Base cost for installation of a typical sidewalk is \$70/linear foot. Cost reflected in this table includes survey/design (12%), contingency (25%), administration (10%) and traffic control/mobilization (7%).

7.3. MAINTENANCE

Proper maintenance of pedestrian and bicycle facilities is a critical element of providing a safe and user-friendly system. Table 7.3 summarizes a recommended maintenance schedule for Mount Shasta’s bicycle/pedestrian system. These guidelines address maintenance of the system’s off-street portions. On-street segments should be maintained according to the standards of the responsible jurisdiction (e.g., City, Caltrans, etc.).

Table 7.3. Maintenance Guidelines

Maintenance Task	Frequency
Inspections	Seasonal – at both beginning and end of summer
Signage replacement	1-3 years
Site furnishings; replace damaged components	As needed
Fencing repair	Inspect monthly for holes and damage, repair immediately
Pavement markings replacement	1-3 years
Pavement sweeping/blowing	As needed; before high use season
Pavement sealing; pothole repair	5-15 years
Introduced tree and shrub plantings, trimming	1-3 years
Shrub/tree irrigation for introduced planting areas	Weekly during summer months until plants are established
Shoulder plant trimming (weeds, trees, branches)	Twice a year; middle of growing season
Major damage response (fallen trees, washouts, flooding)	Schedule based on priorities
Culvert inspection	Before rainy season; after major storms
Maintaining culvert inlets	Inspect before onset of wet season
Trash disposal	Weekly during high use; twice monthly during low use
Litter pick-up	Weekly during high use; twice monthly during low use
Graffiti removal	Weekly; as needed

7.3.1. Path Safety and Security

Various design and programmatic measures can be taken to address safety issues on a shared-use path. Table 7.4 summarizes key safety issues and strategies for minimizing impacts. Following these recommendations can help to clearly delineate public and private space and increase the security of trail users and land owners.

Table 7.4. Safety Recommendations

Safety Issue	Recommended Improvements
Unwanted vehicle access on the path	Utilize landscaping to define the corridor edge and path, including earth berms and large boulders. Consider using bollards at intersections or other access points where unwanted motor vehicle access is demonstrated or anticipated. Pass a motorized vehicle prohibited ordinance and sign the path. Lay the trail out with curves that allow bike/ped passage, but are uncomfortably tight for automobile passage.
Privacy of adjacent property owners	Encourage the use of neighborhood friendly fencing and also planting of landscape buffers. Post path rules that encourage respect for private property.
Litter and dumping	Post path rules encouraging pack-it-in/pack-it-out etiquette. Place garbage receptacles at trailheads. Manage vegetation within the right-of-way to allow good visual surveillance of the path from adjacent properties and from roadway/path intersections. Encourage local residents to report incidents as soon as they occur. Remove dumpsites as soon as possible.
Trespassing	Clearly distinguish public path right-of-way from private property through the use of vegetative buffers and the use of good neighbor type fencing. Post path rules that encourage respect for private property.
Crime	Manage vegetation so that corridor can be visually surveyed from adjacent streets and residences. Select shrubs that grow below 3' in height and trees that branch out greater than 6' in height. Place benches and other path amenities at locations with good visual surveillance and high activity. Provide mileage markers at quarter-mile increments and clear directional signage for orientation.

Safety Issue	Recommended Improvements
Private use of corridor	Attempt to negotiate win/win solutions with property owners. Eliminate where detrimental impact to path cannot be reasonably ameliorated.
Local on-street parking	Post local residential streets as parking for local residents only to discourage path user parking. Place “no outlet” and “no parking” signs prior to path access points.
Trailhead safety	Clearly identify trailhead access areas.
Vandalism	Select benches, bollards, signage and other site amenities that are durable, low maintenance and vandal resistant. Respond through removal or replacement in rapid manner. Keep a photo record of all vandalism and turn over to local law enforcement. Encourage local residents to report vandalism. Involve neighbors in path projects to build a sense of ownership. Place amenities (benches, etc.) in well used and highly visible areas.

7.3.2. *Community Involvement with Safety on the Path*

Creating a safe path environment goes beyond design and law enforcement and should involve the entire community. The most effective and most visible deterrent to illegal activity on Mount Shasta’s path system will be the presence of legitimate path users. Getting as many “eyes on the corridor” as possible is a key deterrent to undesirable activity. There are several components to accomplishing this as outlined below.

Provide good access to the path

Access ranges from providing conveniently located trailheads along the path, to encouraging the construction of sidewalks to accommodate access from private developments adjacent to the path. Access points should be inviting and signed so as to welcome the public onto the path.

Good visibility from adjacent neighbors

Neighbors adjacent to the path can potentially provide 24-hour surveillance of the path and can become the path’s biggest ally. Though some screening and setback of the path is needed for privacy of adjacent neighbors, complete blocking out of the path from neighborhood view should be discouraged. This eliminates the potential of neighbors’ “eyes on the path,” and could result in a “tunnel effect” on the path.

High level of maintenance

A well-maintained path sends a message that the community cares about the public space. This message alone will discourage undesirable activity along the path.

Programmed events

Community events along the path will help increase public awareness and thereby attract more people to use the path. Neighbors and residents can help organize numerous public events along the path, which will increase support for the path. Events might include a day-long path clean up or a series of short interpretive walks led by long time residents or a park naturalist.

Community projects

The support generated by community groups could be further capitalized by involving neighbors and friends of the path in a community project. Ideas for community projects include volunteer planting events, art projects, interpretive research projects, or even bridge building events. These

community projects are the strongest means of creating a sense of ownership along the path, which is perhaps the strongest single deterrent to undesirable activity along the path.

Adopt-a-Path Program

Nearby businesses, community institutions, and residential neighbors often see the benefit of their involvement in the path development and maintenance. Businesses and developers may view the path as an integral piece of their site planning and be willing to take on some level of responsibility for the path. Creation of an adopt-a-path program should be explored to capitalize on this opportunity and build civic pride.

7.3.3. *Winter Maintenance and Snow Removal*

Winter Maintenance and Snow Removal

In Mount Shasta, increasing numbers of cyclists and pedestrians are choosing to travel by these modes year-round. Snow stored on bike lanes or sidewalks presents a significant impediment and disincentive to bicycling and walking in the winter.

Even the best-designed and constructed systems will sustain some damage to their surfaces from the passing of the seasons. In Mount Shasta, maintenance and snow removal is a primary concern. Facility maintenance may be expensive but a program should be adequately funded, managed and carried out. It is essential to budget for both regularly occurring and occasional maintenance activities.

Snow removal and treatment for ice on sidewalks is also a pedestrian accessibility issue, not an optional activity. The Federal Highway Administration (FHWA) has oversight responsibility for all sidewalks constructed with federal funds. A memorandum on snow removal released in August, 2008 states that. “In accordance with [28 CFR § 35.133](#), a public agency must maintain its walkways in an accessible condition for all pedestrians, including persons with disabilities, with only isolated or temporary interruptions in accessibility. Part of this maintenance obligation includes reasonable snow removal efforts. See FHWA, Questions and Answers about ADA/Section 504, question 31 under Maintenance, www.fhwa.dot.gov/civilrights/ada_qa.htm#q31.”⁴

Suggested Winter On-Street Bikeway Maintenance

On-street bikeways can act as temporary snow storage areas during plowing operations in the winter. This effectively narrows the roadway width and forces any cyclists using the roadway closer to traffic. Between storm events, city should remove snow stored on bikeway facilities, both to open these facilities to bicycle use and to clear room for temporary snow storage from subsequent storms.

Suggested Spring Maintenance

As temperatures warm in the spring, on-street bikeways emerge from winter operations covered in debris and in some cases worn or erased from studded snow tires and plow blades. Every effort should be made to sweep and clear these facilities as early as practical. Any signage that is missing should be replaced and any striping or stenciling that has become well worn should be refreshed.

⁴ Memorandum from Butch Wlaschin Director, Office of Asset Management regarding Snow Removal on Sidewalks Constructed with Federal Funding (<http://www.fhwa.dot.gov/preservation/082708.cfm>) accessed October 10, 2008.

These activities should be undertaken as early as possible and constitute the majority of on-street bikeway maintenance.

7.3.4. Suggested Winter Maintenance for Sidewalks

If snow removal operations obstruct publicly maintained sidewalks the sidewalks should be cleared following roadway clearing operations. Typically snow removal is accomplished with special snow blower hardware, either hand pushed, or as an attachment to a vehicle. Salt, sand, or de-icing solution should only be used if special circumstances warrant; such as severe ice buildup or freeze thaw cycles on the sidewalk surface. Costs for winter snow clearance vary based on typical winter conditions. For example, the average estimated maintenance cost for snow removal in Mammoth, California is \$190 per hour of sidewalk with an assumed speed of 1.3 miles per hour or \$146 per mile. This cost assumes facility clearance after each storm event.

7.4. FUNDING OPPORTUNITIES

There are a variety of potential funding sources including local, state and federal funding programs as well as private sector funding that can be used to construct the proposed bicycle improvements. Most of the federal, state programs are competitive and involve the completion of extensive applications with clear documentation of the project need, costs and benefits. Local funding for bicycle projects typically comes from Transportation Development Act (TDA) funding, which is prorated to each county based on the return of gasoline taxes. Many of the projects and programs recommended in the *Mount Shasta Bicycle, Trail and Pedestrian Master Plan* would need to be funded by sources such as TDA, general fund, and regional, state and federal programs. Local businesses, organizations and foundations may also provide another source for funding projects and programs.

7.4.1. Federal Funding Sources

The primary federal source of surface transportation funding—including bicycle and pedestrian facilities—is SAFETEA-LU, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. 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%. SAFETEA-LU 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:

- 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 \$1 billion dollars are available nationally through 2009

Federal Lands Highway Funds

Federal Lands Highway Funds may be used to build bicycle and pedestrian 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. Federal Lands Highway Funds may be used for planning and construction.

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. The program is intended to provide communities with the resources to explore the integration of their transportation system with community preservation and environmental activities. TCSP Program funds require a 20% match.

Regional Surface Transportation Program

The Regional Surface Transportation Program (RSTP) is a block grant program which provides funding for bicycle and pedestrian projects, among many other transportation projects. Under the RSTP, Metropolitan Planning Organizations, such as the Siskiyou County Transportation Commission, prioritize and approve projects which will receive RSTP funds. 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% of RSTP funds are allocated according to population. The remaining 37.5% is available statewide.

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).

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 will be reimbursed for 50% 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% of grants are reserved for Northern California.

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.

7.4.2. *Statewide Funding Sources*

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

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 \$800,000.

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 trails, 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. Town Bicycle Transportation Plans must be approved by the local MPO prior to Caltrans approval. Out of \$5 million available statewide, the maximum amount available for individual projects is \$1.2 million.

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 are 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.

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.

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 grant is funded by the State Highway Account at \$1.5 million annually state-wide. Grants are capped at \$250,000.

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 town 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.

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).

Community Based Transportation Planning Demonstration Grant Program

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

7.4.3. Local Funding Sources

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. Funds for pedestrian projects originate from the Local Transportation Fund (LTF), which is derived from a ¼ cent of the general state sales tax. LTF funds are returned to each county based on sales tax revenues. Eligible pedestrian and bicycle projects include: construction and engineering for capital projects; maintenance of bikeways; bicycle safety education programs (up to 5% of funds); and development of comprehensive bicycle or pedestrian facilities plans. A town, city or county is allowed to apply for funding for bicycle or pedestrian plans not more than once every five years. These funds may be used to meet local match requirements for federal funding sources. Two percent of the total TDA apportionment is available for bicycle and pedestrian funding.

Developer 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 pedestrian improvements designed to encourage residents, employees and visitors to the new development to walk rather than drive. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical to ensure legal soundness. Fees placed on local development can be used as local matching funds to attract funding from other grant sources.

Local Bond Measures

The city could issue bonds to fund pedestrian and bicycle improvements. This would spread the cost of the improvements over the life of the bonds. Certain types of bonds would require voter approval. The debt would have to be retired, so funding for repayment on the bond and the interest would be required.

Business Improvement Districts

Pedestrian improvements can often be included as part of larger efforts at business improvement and retail district beautification. Business Improvement Districts collect levies on business in order to fund area-wide improvements that benefit businesses and improve access for customers. These districts may include provisions for pedestrian and bicycle improvements, such as wider sidewalks, bicycle parking and other end of trip facilities, landscaping and ADA compliance.

Local Improvement Districts (LID)

Through a LID, a street or other transportation improvement is built and adjacent properties that benefit are assessed a fee to pay for the improvement. LID's may be a good choice for funding new sidewalk projects on collector streets.

Transportation User Fees

Transportation user fees are any group of additional fees that could be used to fund maintenance and improvements projects for non-motorized uses. Properties would be assessed fees based on the traffic generation by land use or business activity as published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*.

The fee could be a Street Maintenance Fee, to fund maintenance of the existing roadway system to free up dollars from the state gasoline tax for capital projects. Another potential fee might be a Sidewalk Fee, which could be included with a resident's monthly water bill. A small fee of one or two dollars a month could generate between \$25,000 - \$50,000 to spend on upgrading high priority sidewalks, paths or bike facilities throughout the city.

7.4.4. Non-Traditional Funding Sources

American Greenways Program

Administered by The Conservation Fund, the American Greenways Program provides funding for the planning and design of greenways. Applications for funds can be made by local regional or state-wide non-profit organizations and public agencies. The maximum award is \$2,500, but most range from \$500 to \$1,500. American Greenways Program monies may be used to fund unpaved trail development.

California Center for Physical Activity Grant Program

The California Center for Physical Activity runs several programs related to walking and offers small grants to public health departments. Grants are in the amount of \$4,999 dollars or less and are offered intermittently.

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 pedestrian facilities.

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, town, 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.

7.4.5. *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 or pedestrian project 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.

Other opportunities for implementation will appear over time that may be used to implement the system.