STAFF REPORT

ITEM NO. 16

CITY OF OCEANSIDE

DATE: December 17, 2008

TO: Honorable Mayor and Members of the City Council

FROM: Development Services Department

SUBJECT: **APPROVAL OF THE OCEANSIDE BICYCLE MASTER PLAN**

SYNOPSIS

Staff and the Transportation Commission recommend that the City Council approve the Oceanside Bicycle Master Plan and to include it as a sub element to the City's future Circulation Element.

BACKGROUND

In June 2006, the City of Oceanside received $145,000 in San Diego Association of Governments (SANDAG) grant monies to update the City's current Bicycle Master Plan, which was last updated in 1996 as part of the Recreational Trails Element.

On August 8, 2007, the City Council approved a professional services agreement in the amount of $145,000 with the IBI Group to update the City's Bicycle Master Plan. The IBI Group was the primary consultant and KTU+A, Planning & Landscape Architecture, was selected as the sub-consultant for the Bicycle Master Plan.

ANALYSIS

The purpose of the Bicycle Master Plan is to identify the existing conditions, analyze the needs and future growth of the City's bikeway facility system, and develop recommendations in order to create a safe, effective, and cohesive bikeway system throughout the City. The proposed plan recommends facility types to be implemented and indentifies points where the City's bikeway system can integrate with the existing San Diego County regional bikeway system. A major objective of the study was to develop project goals which are the fundamental criteria for the City of Oceanside's planned bikeway system. The ten project goals are listed as follows:

1. Create and design a bikeway system that will consider all segments of the cycling populations.
2. Lay out a complete bikeway system emphasizing local and regional continuity and connectivity.

3. The bikeway system will be destination oriented towards employment centers and residential areas.
4. A major focus will be given to bicycle safety.
5. The bikeway system will conform to the minimum design standards established by Caltrans.
6. The City will regularly maintain bikeway system segments and facilities.
7. Bikeway system design and layout will minimize the City's and adjacent property owners' liability exposure.
8. Bikeway system design and layout will minimize potential financial burden to the City by engaging development to implement bike segments and locating segments within the existing right-of-way.
9. The bikeway system will utilize environmentally sensitive routing to minimize environmental impacts.
10. To educate both cyclists and drivers to coexists with awareness of one another and to promote the benefits of cycling.

By achieving these goals and implementing the Bicycle Master Plan's recommended bikeway facilities should encourage cycling and create a more bicycle-friendly community in the City of Oceanside.

The Bicycle Master Plan prioritizes needed bicycle facilities within the City and ranks the bicycle facilities for future funding projects. Some of the top priority projects that are being recommended in the Bicycle Master Plan are listed in Section 5.3 (attached). The top three Class 1 bike path projects that were listed are the Coastal Rail Trail, the Oceanside-Escondido Inland Rail Trail, and the San Luis Rey River Trail Extension. Each one of these projects will be reviewed separately through the CEQA approval process.

KTU+A has been able to perform a comprehensive and community-involved process to establish a formal Bicycle Master Plan. Community involvement consisted of two public workshops in the Community Rooms of the City's library. The Transportation Commission's Bicycle Committee and City staff provided input as well.

With its approval by Council, the City will be able to apply for future grants and other funding sources. The City of Oceanside will apply for bicycle funding through the State's Bicycle Transportation Account (BTA) grant money and SANDAG's Transportation Development Act (TDA) grant money. The Bicycle Master Plan needs to be updated every five years.

FISCAL IMPACT

The Citywide Bicycle Master Plan Update was funded through a grant from SANDAG. The FY 2007-08 Capital Improvement Program (CIP) budget includes an appropriation of $145,000 in the Bicycle Program Project Account, (212.727803) for the completion of the study.

INSURANCE REQUIREMENTS

The City's standard insurance requirements were met.

COMMISSION OR COMMITTEE REPORT

The City's Bicycle Committee approved the Bicycle Master Plan in October 2008. At the October 2008 meeting, the Transportation Commission reviewed and approved the Oceanside Bicycle Master Plan.

CITY ATTORNEY'S ANALYSIS

The referenced documents have been reviewed by the City Attorney and approved as to form.

RECOMMENDATION

Staff and the Transportation Commission recommend that the City Council approve the Oceanside Bicycle Master Plan and to include it as a sub-element to the City's future Circulation Element.

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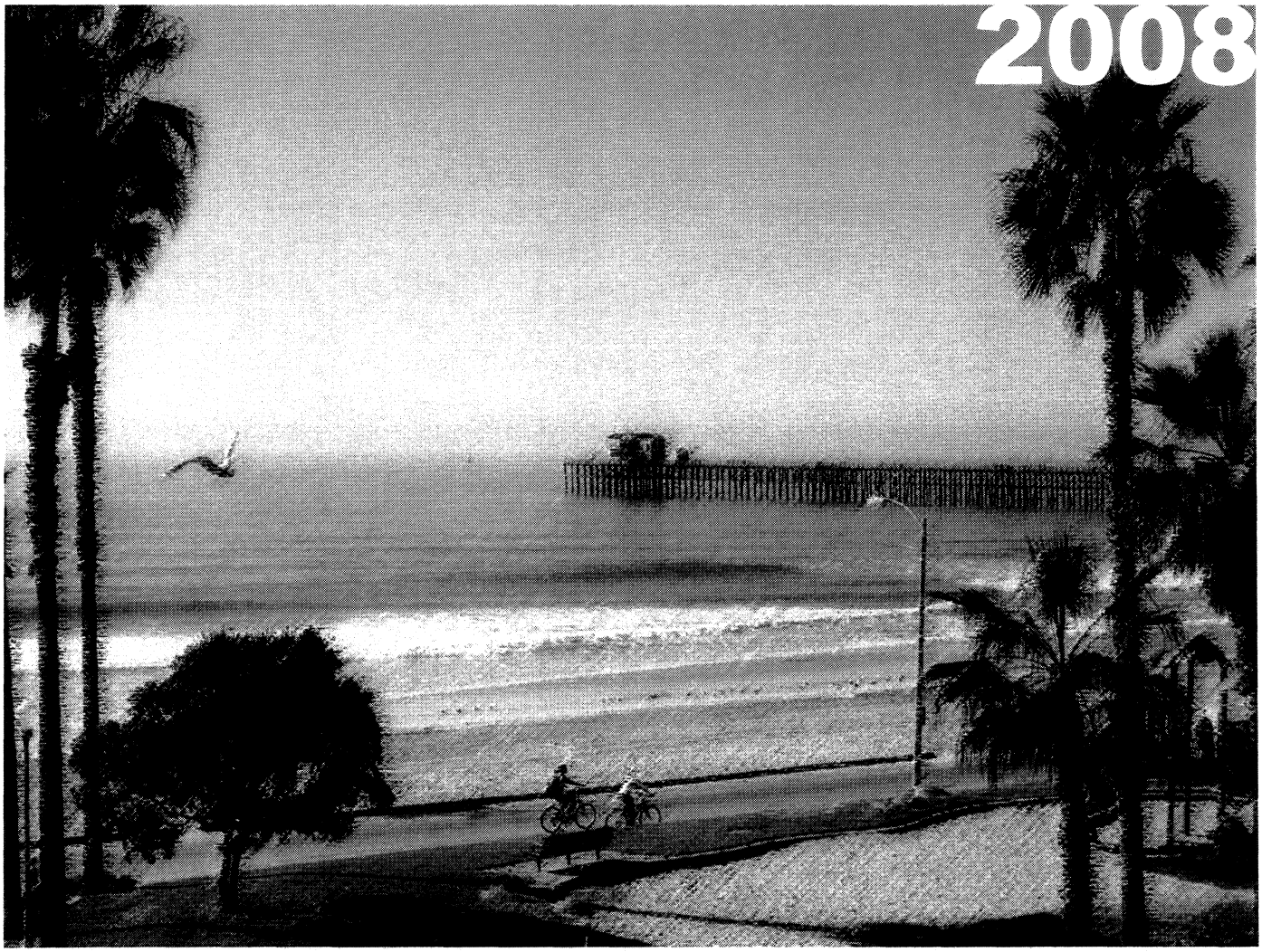
Attachment A: Oceanside Bicycle Master Plan

City of Oceanside
Bicycle Master Plan



Prepared by
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In association with
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for the
City of Oceanside, California

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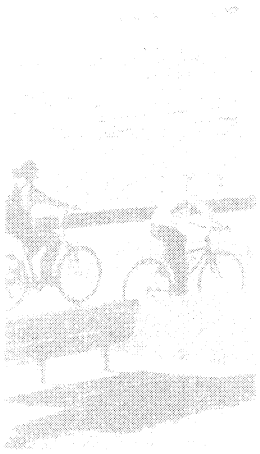

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Executive Summary

Project Scope

This study is a comprehensive update of the 1995 City of Oceanside General Plan Circulation Element and Recreational Trails Element. The city's growth necessitated an update to better address not only local bicycle travel needs, but also to better serve regional long-distance travel and promote tourism. This resulting document should be responsive to any General Plan changes that will affect circulation patterns.

Plan objectives included establishing facility types to be implemented and identifying points where the city's bikeway system could integrate with the existing San Diego County regional bikeway system. The project's scope included documenting and evaluating the City of Oceanside's existing bikeway facility system and its relationship with other systems such as mass transit and recommending improvements wherever appropriate.

This plan sought to maximize the efficiencies offered by multi-modal connections between mass transit and bikeways and to promote a viable alternative to the automobile travel in a climate particularly conducive to bicycle transportation. It also sought to provide a more convenient bikeway system for cyclists who do not have ready access to motor vehicles.

The Cyclist's Perspective

This plan was developed with a "cyclist's perspective" by planners who routinely commute by bicycle and fully understand the implications of bicycle travel. All potential routes were ridden to experience them firsthand, including those routes planners felt would be forbidding to most users due to high motor vehicle speeds and volumes. The planners' "on the ground" familiarity of the City and subsequent thorough analysis resulted in supportable recommendations portrayed in clear text and graphic format.

This plan incorporated the latest in geographic information systems (GIS) technology to support its mapping and planning recommendations. GIS data were used to characterize facility siting factors such as age, commuting, population and employment densities.

Compliance with State Law

Pursuant to California law, this plan is to complement the City of Oceanside's General Plan Circulation Element was used to direct roadway improvements to include bikeway facilities.

By law, cities must adopt their bikeway master plans (termed "Bicycle Transportation Plans" by Caltrans) no earlier than four years prior to July 1 of the fiscal year in which the state's Bicycle Transportation Account (BTA) funds are to be granted. For example, the 2005/2006 fiscal year began on July 1, 2005. Cities applying for 2005/2006 BTA funds must have a bikeway master plan adopted July 1, 2001 or later. This four year cycle should help to make certain that General Plan changes affecting bicycle transportation will be accommodated in a timely manner.

Methodology

The project methodology included a review of applicable documents, field work and geographic information systems (GIS) analysis of the field work data. Oceanside's existing bikeway system was analyzed for a number of factors using both traditional field survey, GIS techniques and with the assistance of the Oceanside Bicycle Committee and City staff.

Literature Review

Applicable sections of documents related to Oceanside's bikeway system are excerpted in Chapter 3: Survey of Existing Bike Maps, Trails and Regional Plans. These include the current City of Oceanside General Plan Circulation Element and Recreation Trails Element as well as neighboring community, regional and state plans and guidelines.

Field Work

During the initial field work, all mapped routes were driven to verify accuracy with respect to existing bikeway mapping data. The consultant also rode many of these routes by bicycle, especially those that did not appear to be consistent with the data. These discrepancies were often discontinuous routes or route extensions that had not been previously digitized.

Community Input

Community involvement consisted of a two public workshops at the Oceanside Public Library. The first was conducted on February 2nd, 2008 in which over 50 people attended. This was the public meeting to introduce the Bicycle Master Plan to the community. The first half hour was dedicated to talking about the Master Plan and existing conditions while the second hour was an open forum for attendees to mark up maps and add comments, suggestions and recommendations. The second workshop was held on May 10th, 2008 in which a little over 20 people attended. This workshop was an open forum with a focus on recommended bicycle facilities and the Four Es: Engineering, Encouragement, Education and Enforcement. Large plots were available for attendees to add additional comments and suggestions.

Project Approach

The overall approach taken in this master plan can be summarized as the following:

- The bicycle master plan should be integrated into all transportation plans, especially if the bicycle will use general purpose roads shared with other forms of transportation.

- An administrative framework and the support of public interest groups is critical for the success of a master plan effort.

- The aim of planning for bicycles should not be focused on any particular product so much as it should be focused on the safe and efficient travel of cyclists. This will generally require both the use of the existing transportation infrastructure and the construction of special facilities for cyclists.

- The maintenance of bicycle facilities and the monitoring and assessment of their performance must ensure continuing safe and efficient travel for cyclists. Planning for cyclists is an on-going process.

- The co-existence of cyclists and drivers on the roads requires that both are sensitive to and recognize a common set of rules. Encouragement, education and enforcement are as important as physical planning and design.

- It is imperative that a "bicycle perspective" guide any planning for cyclists. The bicycle has its own characteristics, constraints and opportunities that the planner must consider. This must be combined with the recognition that cyclists do not form a homogeneous group in terms of age, ability, experience or traffic judgment.

Funding Sources

Appropriate funding for bikeway facilities could come from many sources. An increased emphasis on integrated multi-modal planning has created several federal, state and local funding sources for new bicycle facilities. Understanding the grant program and selection

criteria of these programs can dramatically increase the likelihood of funding. The applicable funding sources will be somewhat dependent on the selected conceptual framework for the bikeway system. (See Chapter 5: Prioritized Projects and Funding.)

Planned bikeway facilities reflect an understanding of budgetary constraints. The planning team's approach was to emphasize solutions for which funding is most readily available, but not to the exclusion of the goals and objectives of the master plan.

Bikeway Continuity

Many existing systems receive less use than projected because the potential users view them as too piecemeal in configuration, and therefore inefficient and unsafe. The creation of an effective bikeway system may be achieved with steps as relatively simple and cheap as re-striping roadways and installing signage, but it will probably also require more costly measures such as the establishment of easements, removal of encroachments, or even the outright purchase of land. The planning team's approach included evaluation of methods for maintaining bikeway cohesiveness, with proposed solutions within the proper conceptual framework.

Understanding Cyclists' Needs

Only a cyclist truly understands the needs of a cyclist. The proper cycling perspective must permeate the bikeway planning process. This issue is fully understood by the planning team members. It has much to do with the team's desire to pursue this planning project; to see it done right. The team's personnel selection was based in part on cycling experience.

Project Goals

The following project goals were developed in close cooperation with City staff. These goals are the fundamental criteria for the City of Oceanside's planned bikeway system.

1. Popular
Bikeway system design and layout will consider all segments of the cycling population.

2. Systemic
The bikeway system will endeavor to be a complete system emphasizing local and regional continuity and connectivity.

3. Destination-Oriented
The bikeway system will be destination-oriented, especially towards employment centers, residential areas and high use activity centers – including access to other modes of local and regional transportation systems.

4. Safe
Safety will be the bikeway system's paramount concern, focusing on maximum visibility for the cyclist, signage, bikeway segment selection and utilizing easily recognized markers to clearly identify paths, lanes and routes.

5. Designed to Standards
The bikeway system will conform to the minimum design standards established by Caltrans. Facilities will endeavor to include, but not be limited to, bike lockers and locking racks.

6. Maintained
The City will regularly maintain bikeway system segments and facilities.

7. Minimize Liability Exposure
Bikeway system design and layout will minimize the City's and adjacent property owners' liability exposure to issues such as trespassing, loss of privacy, damage and property loss associated with bike routes.

8. Minimize Cost
Whenever possible, bikeway system design and layout will minimize potential financial burden to the City by engaging development to implement bike segments, locating segments within the existing right-of-way and minimizing the need for acquisition.

9. Environmentally Sensitive
Whenever possible, the bikeway system will utilize environmentally sensitive routing to minimize environmental impacts.

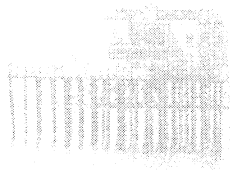
10. Educational
The bikeway master plan will consider methods not only to promote the benefits of cycling, but also to enhance safety by educating both cyclists and drivers to coexist with an awareness of each other.

Project Definitions

To prevent the confusion that can occur when referring to bikeways, bicycle lanes, bicycle routes, bicycle trails or bicycle paths, the California Department of Transportation (Caltrans) standards for referring to bikeway facility types are used throughout this document. (See photos and Section 1.3: Bikeway Facility Types on pages 1-1 & 1-2.)

Trip Origin and Destination Analysis

Analysis of specific types of bicycle trip origin and destination points are required by Caltrans for its approval of bikeway master plans. The standard Caltrans list includes residential neighborhoods, schools, shopping centers, public buildings and major employment centers (Bicycle Transportation Account Compliance - Code Section 891.2). These were identified and analyzed and further supplemented by additional types of origin and destination points. Other trip origin and destination points included the city hall, hospitals, park and ride lots, train stations, transportation centers, parks, community or visitors center and libraries. (See Chapter 2: Section 2.1 Existing Land Use and Section 2.7Activity Centers.)

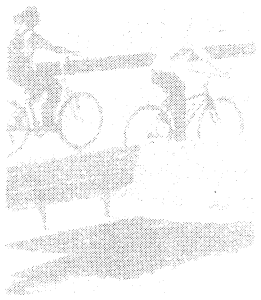


Multi-Modal Analysis

Linking the bikeway facility system with other transportation modes can enhance the efficiency of bicycle transportation, especially for commuting cyclists. They can use their bicycles to get to or from a multi-modal transfer point as part of their regular commute. Where transit modes allow bicycles on board, multi-modal transit becomes a very useful transportation option. Whether the other modes allow bicycles to be brought on board or not, they allow for much greater flexibility for persons choosing to commute by modes other than the private automobile. (See Chapter 2, Section 2.12 Access to Transit Site and Inter-Modal Transfer Points)

Safety Analysis

Safety is a primary concern in evaluating an existing bikeway facility system or in proposing new facilities or extensions. The primary lesson learned from the data reviewed for this bicycle master plan and others is that installation of bicycle facilities without careful consideration of their specific attributes and drawbacks can actually exacerbate already problematic safety situations. This is particularly true for facilities that are likely to be used by other types of users such as walkers, runners and skaters, in addition to cyclists. Well designed, attractive, off-street bicycle facilities tend to become mixed use facilities and the other user types do not move with the relative predictability of vehicles. On the other hand, even though they move with more predictability, cyclists using on-street facilities must contend with motor vehicles. Safety concerns vary considerably depending on the type of bicycle facility. (See Chapter 2, Section 2.9 Safety and Security)



Opportunities and Constraints

Most of the bikeways proposed in this bikeway transportation plan update have been proposed in other documents, such as in the existing 1995 General Plan and Recreational Trails

Element as well as the San Luis Rey River Trail: Opportunities and Constraints Study (2005). Whenever possible, routes were proposed to take advantage of opportunities to make connections between bicycle trip origin points and destination points in sections of the city that may not otherwise be accessible via a bikeway facility. This was generally feasible due to overall manageable grades within the city. The opportunities for a viable bikeway system in the City of Oceanside are in place. (See Chapter 4: Recommendations.)

Current Constraints to Cycling

High Motor Vehicle Speeds

Fortunately, the major roads that have high speeds have bike lanes built into them except for North River Road and the western end of State Route 76. Experienced cyclists are generally not concerned with adjacent motor vehicle speeds when on a Class 2 bike lane, but when facilities do not exist it becomes more of a concern. Less experienced cyclists are more likely to find such conditions very uncomfortable and may be less likely to use these high speed roadways.

Freeway Crossings

The City of Oceanside has three freeways travelling through the City. Interstate 5 along the coast and State Routes 76 and 78 which travel east-west in the northern and southern parts of the City. Freeway crossings become a barrier to bicycle travel when bicyclists have to manage high vehicular speeds along off and on ramps. In many cases manuevering through both within about 100 feet. High volume connections to the coast include Mission Avenue, Oceanside Boulevard and State Route 76 which cross over Interstate 5. State Route 78 terminate on Interstate 5 but bicycle access is prohibited on State Route 78.

Narrow Roadways

Many roadways in Oceanside on which Class 2 bicycle facilities are proposed have adequate rights-of-way. However, implementation of some proposed routes may be constrained by the lack of available physical space because the some roadways on which they are proposed may have limited rights-of-way and on-street parking. Providing bicycle facilities such as Class 3 bike routes are the best solutions for connectvity in areas already built out. Oceanside is predominantly residential land use so speeds are relatively low with some streets wide enough to accomodate cyclists without the use of bike lanes.

Recommendations

The recommended routes are intended to take advantage of existing and programmed roadways and existing bicycle facilities to resolve cyclists' concerns for safety and connectivity. The City of Oceanside has a comprehensive system of Class 2 bikeways on its major roadways, but lacks connectivity within existing neighborhoods to attractors such as schools and parks in which Class 3 bike routes are recommended. The Class 1 San Luis Rey River Trail is the only major Class 1 bike path within the City with a few small section of the Costal Rail Trail. The facilities are shown in Figure 2-15: Existing Bicycle Facilities with Recommendations in Chapter 4.

CIPs and Bikeway Funding

The following sections define the recommended bikeway system improvements as CIP projects with basic construction costs. See Figure 5-1: Typical Unit Construction Costs for general bikeway component construction costs. For a brief description of each segment, including estimated costs and segment lengths, see Sections 5-3 through 5-4 Priority Projects. The remaining sections of Chapter 5 describe the funding sources available for bikeway projects, followed by a summary, Figure 5-5: Bikeway Facility Funding Summary.

Bikeway Development Priorities

The factors used in prioritizing the implementation of potential bikeway project types included probable demand, regional significance, transportation efficiency and likely funding sources. With these criteria, Coastal Rail Trail was given the highest priority, followed by routes that would most benefit bicycle transportation.

Note that the segment numbering sequence lists the Class 1 San Luis Rey River Trail connections first, along with separate lists of proposed Class 2 facilities and the Class 3 facilities. This represents the recommended prioritization within facility classes only. It is difficult to prioritize all of the proposed bikeway facilities across the facility classes because several Class 3 routes could be implemented for far less than the cost of a single Class 2 lane, for example. Therefore, it is recommended that the Class 1, 2 and 3 facilities be regarded as parallel lists and be implemented as appropriate funds become available for each type of facility. (See Section 4.2: Recommended Projects)

Class 1 Bikeways Costs

Because they are constructed independently of existing or programmed motor vehicle facilities, Class 1 paths are by far the most expensive of all bicycle facilities. Typical costs per mile can vary a great deal due to possible right-of-way acquisition, bridges and other potential major expenses such as extensive grading. The cost range is primarily due to topography and facility width. For example, a Class 1 facility being converted from a rail roadbed across flat terrain will require far less grubbing, grading and structural enhancements than a facility being constructed through an undeveloped area with hilly topography. For this bikeway master plan, the cost used in Chapter 5 for the rail trail segment was $466 per linear foot, or approximately $2,460,480 per mile, due to potentially extensive construction, grading, bridges and environmental review. A more standardized figure was used for the other Class 1 segments of $190 per linear foot, or $1,000,000 per mile.

Class 2 Bikeways Costs

Class 2 facility costs are approximately $15,000 to $35,000 per mile. This cost includes all necessary lane striping and signage, but does not include widening of roadways or land acquisition, if necessary. The cost used in Table 8-2 was $6 per linear foot, or approximately $32,000 per mile.

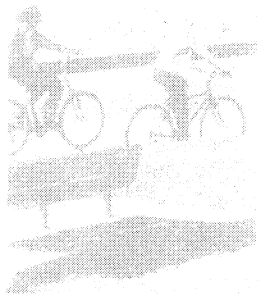
Class 3 Bikeways Costs

Class 3 routes costs are the lowest of all facility types because the only physical improvement to be installed is route signage. The cost range is $1,500 to $5,000 per mile. The cost used in Chapter 5 was $0.70 per linear foot, or approximately $3,500 per mile. Shared Lane Symbols or "Sharrows" have already been purchased by the City at a cost of $600 for the stencil. Cost for the installation of each symbol is $75. These Shared Lane symbols are an optional addition to the standard bike route signage along Class 3 routes.

Bikeway Funding Sources

Federal, State and local government agencies invest billions of dollars every year in the nation's transportation system. Only a fraction of that funding is used in development projects, policy development and planning to improve conditions for cyclists. Even though appropriate funds are limited, they are available, but desirable projects sometimes go unfunded because communities may be unaware of a fund's existence, or may apply for the wrong type of grants. Also, the competition between municipalities for the available bikeway funding is often fierce.

Whenever Federal funds are used for bicycle projects, a certain level of State and/or local matching funding is generally required. State funds are often available to local governments on similar terms. Almost every implemented bicycle program and facility in the United States has had more than one funding source and it often takes a good deal of coordination and opportunism to pull the various sources together.



According to the FHWA's publication, *An Analysis of Current Funding Mechanisms for Bicycle and Pedestrian Programs at the Federal, State and Local Levels*, where successful local bike facility programs exist, there is usually a full-time bicycle coordinator with extensive understanding of funding sources. Cities such as Seattle, Washington, Portland, Oregon and San Diego are prime examples. Bicycle coordinators are often in a position to develop a competitive project and detailed proposal that can be used to improve conditions for cyclists

within their jurisdictions. Much of the information on Federal and State funding sources was derived from the previously mentioned FHWA publication.

Additional Resources
Chapter 6 contains a comprehensive set of bikeway design guidelines.

The appendices contain applicable state and federal bikeway planning publications, guidelines for selecting safe routes to school, and the California Vehicle Code sections on roadway bicycle use. The final appendix is the entire Caltrans H*ighway Design Manual Chapter 1000 – Bikeway Planning and Design*.

Caltrans BTA Compliance

Bicycle Transportation Account Code Section 891.2 Compliance

The Bicycle Transportation Account (BTA) funds projects that improve safety and convenience for bicycle commuters. To be eligible for BTA funds, the bikeway master plan must address items (a) through (k) of Section 891.2 of the California Streets and Highways Code. For reviewer convenience, code text and associated document sections are listed below.

(a) The established 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.
The established number of bicycle commuters in the plan area is 266. The estimated increase in the number of bicycle commuters resulting from implementation of this plan is five percent, or 279. The figures are substantiated in the following three paragraphs.

Oceanside has a population of approximately 161,029 (from SANDAG Census 2000 Profile, June 2003). According to the Census profile, approximately 60 percent of the population is employed, or 72,108 out of 120,323 people for the City of Oceanside. SANDAG's Census Profile estimates that there are 69,450 people who commute to work and of that, 266 use the bicycle as a means of transportation. Those results indicate that less than 1 percent of the commutes are done by bicycle.

To this number must be added children who ride bikes to school. According to Census Profile, the school age population (5-17 years old) is 28 percent of the overall population, or 44,458. According to surveys conducted at area schools for other similar studies over the last several years, roughly 1.5 percent of school age children ride bikes to school or 667 in Oceanside.

These additional 667 school age bicycle commuters added to the 266 adult commuters yields an estimated City total of 933 bicycle commuters, or less than 1 percent of Oceanside's total population of 161,029. The estimated increase resulting from implementation of this plan is 47, or 5 percent more than the current 933 bicycle commuters in Oceanside, totaling 980. (Note that using SANDAG Census 2000 Profile data likely underestimates bike commuter numbers because the Census only asks for the primary transportation mode to work, missing the once or twice a week bike commuter. Also, more commuters are likely to bicycle in Southern California than the national average.)

(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.
See Figure 2.1 Existing Land Use and Figure 2.2 Planned Land Use.

(c) A map and description of existing and proposed bikeways.
See Figure 2.15 Existing Bicycle Facilities and Figure3.1 Planned Bicycle Facilities.

(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.
See Figure 2.9 Activity Centers.

(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, ferry docks and landings, park and ride lots, and provisions for transporting bicyclists and bicycles on transit or rail vehicles of ferry vessels.
See Figure 2.14 Bus Stop Boarding and Alightings and Figure 2.16 Sprinter and Coaster Station Alignments.

(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.
See Figure 2.9 Activity Centers.

(g) A description of bicycle safety and education programs conducted in the area included in the plan, efforts by the law enforcement agency having primary traffic law enforcement responsibility in the area to enforce provisions of the Vehicle Code pertaining to bicycle operation, and the resulting effect on accidents involving bicyclists.
Bike lanes, bike routes and Yield to Bike signs are used throughout the City of Oceanside to remind motorists to expect bicyclists on the streets. In 2008, the City will be installing additional "Share the Road" signs throughout the City. Free League of American Bicyclists (LAB) Road 1 classes are offered to Oceanside residents through the San Diego County Bicycle Coalition. The plan is to offer the BikeEd Road 1 course to the community next year through the City of Oceanside Parks and Recreation Department. Parks and Recreation provides a children's coloring book that includes bike safety. Bicycle safety materials are made available to the public through the San Diego County Bicycle Map that includes the Oceanside area and provides Bicycle Rules of the Road. This map is available at City Hall. There are currently thirteen League Cycling Instructors in the County who are authorized to teach this course with two residing in Oceanside, Dolores Wells and Pete Penseyres.

In past years, the City has hosted a pit stop on Bike to Work Day and advertised in the Oceanside Magazine and local television station KOCT. The city will continue to host a pit stop during Bike to Work Day. The City also promotes bicycling through the Oceanside Family Bike Day. This is a ride along the seven mile San Luis Rey Bike Path. The Bike MS Bay to Bay Tour, which is a fundraising event to help the Pacific Coast Chapter of the National Multiple Sclerosis Society (NMSS), will also have a stop in Oceanside at Buccaneer Park. Other bicycling efforts within the City of Oceanside include a yearly triathlon, as well hosting the start of the Race Across America. This race is the longest running bicycle endurance competition in the world.

Opportunities to rent bicycles within the City are provided through the Dasani Blue Bike Program and Cobi Rentals which provides rental bicycles at the beach. Approximately 80 riders per month have been using the Dasani Blue Bike Program.

The local police department is aware of the concerns of the cyclists in the community. The police department traffic sergeant attends and works closely with the Oceanside Bicycle Committee. The police department has been provided with materials to train police officers and the department has committed to officer training in bicycle issues. There are currently seven bicycle officers with the Resource Team that patrols the downtown and beach areas.

(h) A description of the extent of citizen and community involvement in development of the plan including, but not be limited to, letters of support.

Community involvement consisted of the first public workshop on February 2, 2008 at the Oceanside Public Library in which over 50 people attended. This was the public meeting to introduce the Bikeway Master Plan (BMP) to the community. The first hour was dedicated to talking about the BMP, while the second hour presented was used to answer questions and work with attendees on what they would like to see to make Oceanside a more bike friendly community. Some issues raised by the public were the completion of the Coastal Rail Trail and the Inland Sprinter Trail. One of the most common topics attendees mentioned was both driver and cyclist education. Maintenance of existing facilities was also a topic discussed throughout the workshop.

The second workshop was conducted on May 10th at the Oceanside Public Library. Twenty people attended this final workshop to discuss the proposed routes recommended in this plan and to add, remove or alter recommended routes. The four Es were also discussed on presentation board; Education, Enforcement, Engineering and Encouragement. There was no presentation since this workshop was a more open forum where the attendees discuss issues and concerns with the consultant team and City staff.

A total of 157 surveys were compiled throughout the length of the project. Adding more bike lanes and Class 1 bike paths is a priority in most surveys as well as repairing existing streets and intersections and filling in facility gaps. Increasing public education on sharing the road regular maintenance were also high priority issues. An employer providing showers and bike storage facilities was one of the lowest priorities.

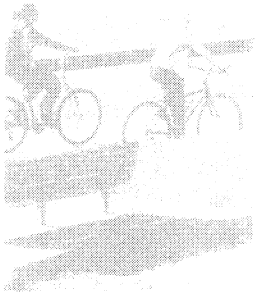
Just less than half of the survey participants stated they bicycle for transportation and mostly 2-3 days per week. Most bicycle for exercise and recreation 2-3 days per week and mostly on weekend mornings and afternoons. Bicycling is also a family activity for over 55 percent of the survey participants and is done on a weekly basis mostly during weekend afternoons.

(i) A description of how the bicycle transportation plan has been coordinated and is consistent with the local or regional transportation, air quality or energy conservation plans, including, but not be limited to, programs that provide incentives for bicycle commuting.

The selection of new bikeways proposed in this plan reflects review of regional transportation plans by providing linkages to regional bikeways wherever possible. The City of Oceanside has yet to implement some of the programmed bikeway facilities in the 1995 General Plan and Circulation Element. Segments recommended in this update are intended to fill gaps in the existing system and look at alternatives to programmed and suggested facilities. The remainder is intended to provide school age children with safer routes to elementary and middle schools. This plan also works to make bicycle travel within the City of Oceanside more convenient and safe so that people are encouraged to reduce their motor vehicle travel in lieu of bicycles by providing more direct and consistent routes.

(j) A description of the projects proposed in the plan and a listing of their priorities of implementation.
See Chapter 5: Prioritized Projects and Bikeway Funding.

(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.
The City of Oceanside currently spends $10,000 a year on sweeping and maintenance on the San Luis Rey River Trail. Sweeping occurs once a month along the length of the path. Street sweeping occurs twice a month. The City just purchased a stencil for the Shared Arrow or "Sharrow" to be painted along the length of Pacific Street. This one time purchase of the stencil was $600. Installation of these stencils is $75 per location with 25 locations planned along Pacific Street. The grand total for the improvement along Pacific Street is $1,875. Phase 2 of the San Luis Rey River Trial extension from College Boulevard to North Santa Fe Road will cost $488,000.

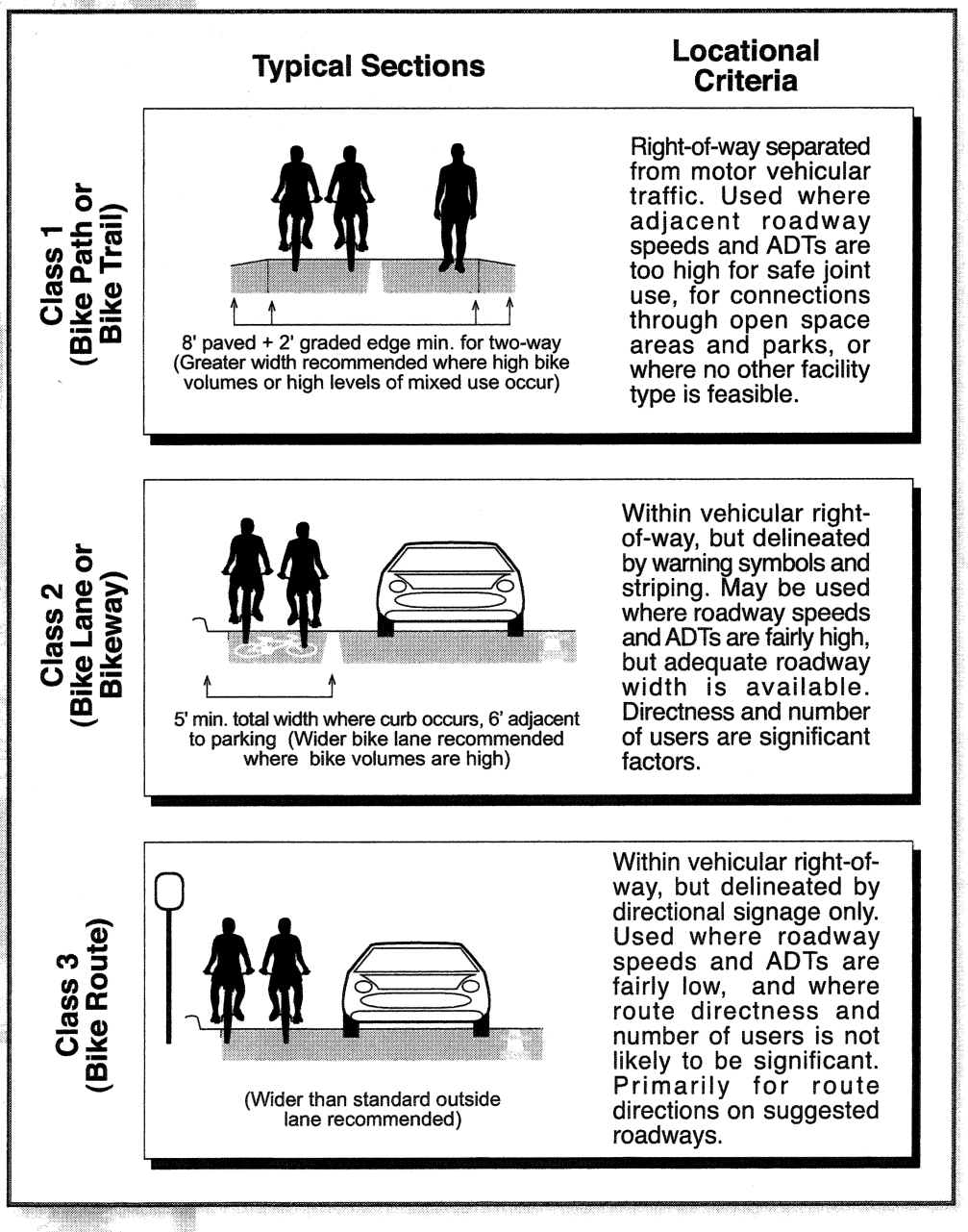


1 Introduction

1.1 Project Scope

The purpose of this plan is to identify the existing conditions, analyse the needs and future growth of the city and develop recommendations to achieve a bicycle friendly atmosphere within the City of Oceanside. This will allow the Bicycle Master Plan to determine the needs and feasibility of proposed projects from the 1995 City of Oceanside General Plan. Included in this report is the current circulation element, existing and proposed land use, existing and proposed bicycle facilities along with collisions, bikeway facility types, activity locations, public transportation and studies and policies related to bicycle facilities. The ultimate goal of the this Bicycle Master Plan is to assisting in designating the City of Oceanside as Bicycle Friendly Community through criteria and improvements set forth by the League of American Bicyclists.

Figure 1.1 Bikeway Facility Types



1.2 Field Work

Field work was conducted in November 2007 through the spring in 2008 under mostly sunny skies and temperatures between 65-80 degrees. Much of the fieldwork consisted of riding these facilities with bicycles to obtain first hand experience on the facilities. Members of the Oceanside Bicycle Committee assisted in field visits to help identify issues throughout the City.

1.3 Bikeway Facility Types

Bikeway facilities considered for this study include Class 1 bike paths, Class 2 bike lanes and Class 3 bike routes. The following text and graphics describe their relative uses and attributes. (See figure at left.)

1.3.1 Class 1 Bike Paths

Class 1 bike paths are hard-surface routes within an exclusive right-of-way physically

separated from vehicular roadways and intended specifically for non-motorized use. They are generally two-way with center striping, with a minimum paved width of eight feet, with an additional two feet of graded edge on each side, for a total of twelve feet. These facilities, although funded and designated as bikeway facilities, are frequently used by other non-motorized users and should be designed to account for them. Where volumes are anticipated to be high, and where significant numbers of other user types will be likely to use the path, additional width should be provided.

1.3.2 Class 2 Bike Lanes

Class 2 facilities are marked bicycle lanes within roadways adjacent to the curb lane, delineated by appropriate striping and signage. Bicycle lanes help to delineate available road space for preferential use by cyclists and motorists, and to promotee more predictable movements by each. Bicycle lane markings can increase a cyclist's confidence in motorists not straying into his/her path of travel. Likewise, passing motorists are less likely to swerve to the left out of their lane to avoid cyclists on their right.

Class 2 Bike Lane (Lake Boulevard)

Bicycle lanes must be one-way facilities and carry traffic in the same direction as adjacent motor vehicle traffic. Two-way bicycle lanes on one side of the roadway are unacceptable because they promote riding against the flow of motor vehicle traffic. Wrong-way riding is the primary cause of bicycle crashes and violates the "Rules of the Road" stated in the Uniform Vehicle Code. Bicycle lanes on one-way streets should be on the right side of the street. In unique situations, it may be appropriate to provide a contra-flow bicycle lane on the left side of a one-way street where it will decrease the number of conflicts (e.g., those caused by heavy bus traffic). Where this occurs, the lane should be marked with a solid, double yellow line and the width of the lane should be increased by one foot.

Under ideal conditions, the minimum bicycle lane width is five feet, but certain edge conditions can dictate additional desirable bicycle lane width. However, even where roadway width is available, Class 2 bike lanes should be no wider than eight feet to prevent the appearance of a travel lane that could encourage motorists to drive in them.

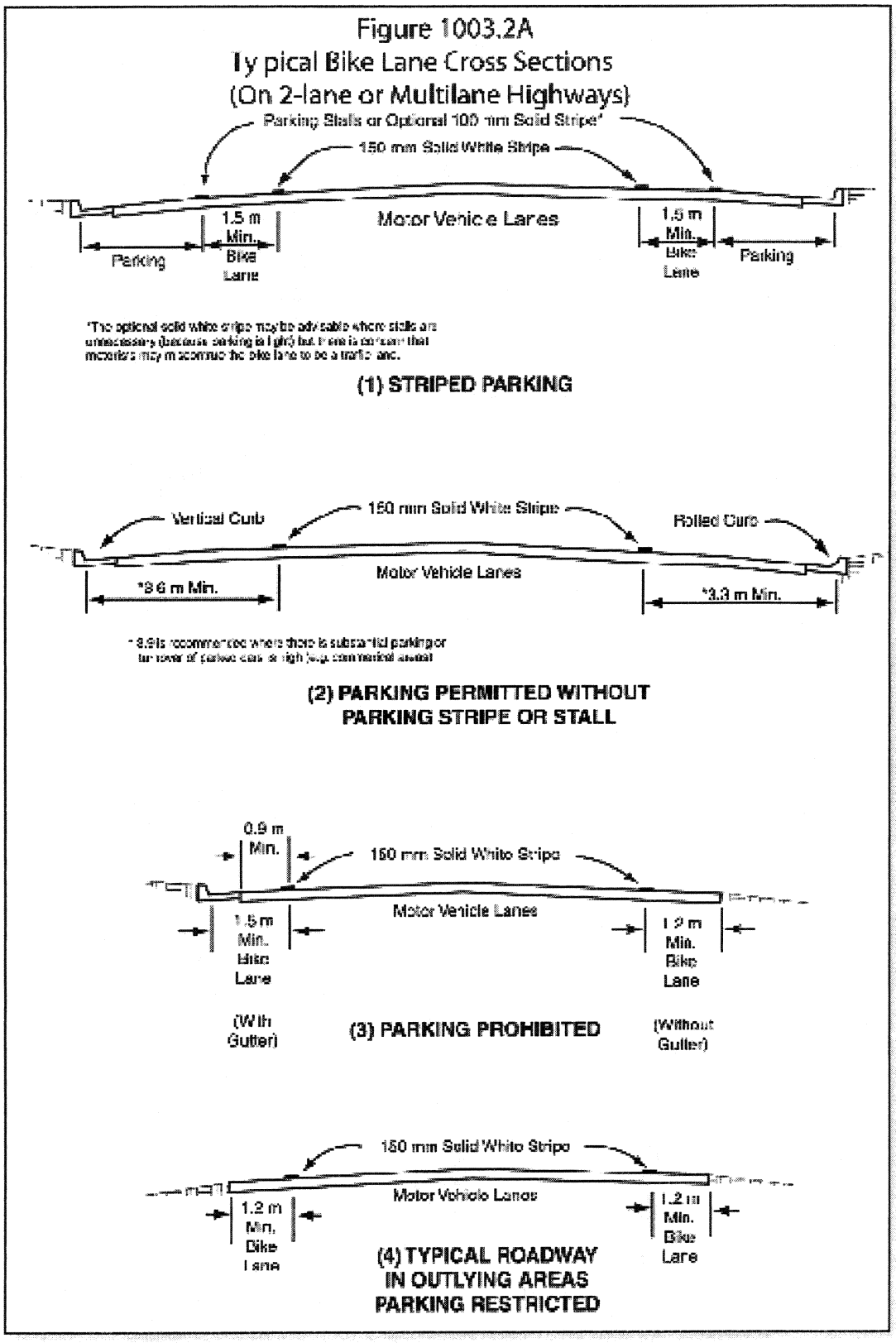
If parking volume is substantial or turnover is high, an additional one or two feet of width is desirable for safe bicycle operation. Bicycle lanes should always be placed between the parking lane and the motor vehicle lanes. Bicycle lanes between the curb and the parking lane can create obstacles for cyclists and eliminate a cyclist's ability to avoid a car door as it is opened. Therefore, this placement should not be considered.

The Caltrans Highway Design Manual depicts four common locations for such facilities in relation to the roadway. (See figure on next page.) The first section depicts bicycle lanes on an urban curbed street where a striped parking lane is provided. The minimum bicycle lane width for this location is five feet.

The second section depicts an urban curbed street where parking is allowed, but without striping for a separate bike lane. This parking lane shared with bicycles should be 11 to 12 feet wide (3.3-3.6 meters). 13 feet (4m) is recommended where parking turnover is high, such as commercial districts. Cyclists do not generally ride near a curb because of the possibility of debris, of hitting a pedal on the curb, of an uneven longitudinal joint, or of a steeper cross slope.

The third section shows a roadway where parking is prohibited. Bicycle lanes in this location should have a minimum width of five feet (1.5m) where a curb occurs (measured from the

Figure 1.2 Typical Class 2 Bike Lane Sections



curb face) and four feet (1.2m) where no curb is used. If the longitudinal joint between the gutter pan and the roadway surface is uneven and falls within five feet of the curb face, a minimum of four feet should be provided between the joint and the motor vehicle lanes.

The fourth section depicts lanes on a roadway without curbs where parking is prohibited.

1.3.3 Class 3 Bike Routes

A Class 3 facility is a suggested bicycle route marked by a series of signs designating a preferred route between destinations such as residential and shopping areas. A network of such routes can provide access to a number of destinations throughout the community. In some cases, looped systems of scenic routes have been created to provide users with a series of recreational experiences. In addition, such routes can provide relatively safe connections for commuting to workplaces or schools.

Class 3 Bike Route with Shared Lane Markings on Pacific Street

The designation of a roadway as a Class 3 facility should be based primarily on the advisability of encouraging bicycle use on that particular roadway. While the roadways chosen for bicycle routes may not be free of problems, they should offer the best balance of safety and convenience of the available alternatives.

In general, the most important considerations are pavement width and geometrics, traffic conditions and appropriateness of the intended purpose. A certain amount of risk and liability exists for any area that is signed as a Class 3 bike route. The message to the user public is that the facility is a safe route. Therefore, routes should not be placed on streets that do not meet appropriate safety standards.

How appropriate a particular roadway is for a bicycle route include directness, connectivity with other bicycle facilities, scenery and available services. Directness is important for cyclists traveling for a purpose, such as commuting, though this is not the case for recreational riders, for whom scenery or fitness may be the primary factor in selecting a route. For recreational riders traveling more than a few miles, services such as food, water, restrooms and pressurized air may be of interest.

According to the *Manual of Uniform Traffic Control Devices* (MUTCD), Bicycle Route Guide (MUTCD Sign Type D11-1) signs should be provided at decision points along designated bicycle routes, including signs to inform bicyclists of bicycle route direction changes and confirmation signs for route direction, distance, and destination. These signs should be repeated at regular intervals so that bicyclists entering from side streets will know that they are on a bicycle route. Similar guide signing should be used for shared roadways with intermediate signs placed for bicyclist guidance. (See below.)

Shared Lane Marking which can be found on Pacific Street

Class 3 Bike Rute Sign

2 Existing Conditions

2.1 Existing Land Use

According to SANDAG's 2006 Existing Land Use, the highest type of land use is single-family residential consisting of 25% of the City. Agriculture and field crops is the second highest land use at 13%, followed by undeveloped land at 10%, open space parks at 9% then multi-family residential at 4%. Agriculture can primarily be found along North River Road in the northeast portion of the City. Larger spans of commercial land use can be found along major arterials such as along Oceanside Boulevard, Coast Highway, Mission Avenue and College Boulevard. Industrial and Business Park centers are primarily along Oceanside Boulevard with a few industrial centers on Mission Avenue.

2.2 Planned Land Use

In 2020, single-family residential will still be the prominent land use as it increases to 32% of the occupied land. A majority of the undeveloped land becomes single-family residential and is scattered throughout the city. Most of the change occurs in the northeast portion of the City. Open space parks and preserves increases slightly to 10% while agriculture and multi-family residential remain the same. One of the larger gains in land use type is the form of industrial parks. Still primarily located along Mission Avenue and Oceanside Boulevard, there is an increase of 3% from 2% in 2006 to 5% in 2020. This increase can be found between Oceanside Boulevard and Mesa Drive to the north and south and Rancho Del Oro Drive and College Boulevard to the east and west. Just to the west of the new industrial area, the park is planned between El Camino Real and Rancho Del Oro in the El Corazon property.

2.3 Bike Commuting

Using 2000 Census information, bike commuting to work was extracted to get an idea of the distribution of bike commuters within the City. Higher densities of bike commuters are on the western end of the City along Interstate 5 where Downtown Oceanside is located and the northwestern end of State Route 76. Scattered throughout the City are pockets of higher density bike commuters along Mission Avenue, Vandergrift Boulevard, Oceanside Boulevard and Lake Boulevard.

2.4 Age Density: Under 16 Years Old

The age of a bicyclist plays a part in the analysis of potential bicycle facilities. Kids under the age of 16, or the age teenagers are able to acquire a driver's license, have a tendency to still be riding bicycles as a means of transportation. Areas of higher densities of children under the age of 16 are taken into consideration to identify potential facilities to provide a safer route to schools, parks and commercial areas. The areas of higher densities of kids under 16 years old is scattered throughout the City. Densities higher than 6 kids per acre can be found near Oceanside High School, just off Interstate 5 and off of Bush Street, just east of the City Hall. Two other areas with similar densities are along Los Arbolitos Boulevard and along North River Road just west of Libby Lake.

2.5 Employment Density

In 2000, higher employment densities are primarily found in the areas of commercial and retail land use along Coast Highway, Mission Avenue, Oceanside Boulevard and Vista Way. In 2030, the pattern of employment densities is similar but increases significantly in these same areas. As planned in 2020, industrial parks increase by 2% thus seeing an increase in employment densities in these planned industrial parks. Most notable increases are the industrial parks along west Mission Avenue and along Oceanside Boulevard from El Camino Real to College Boulevard. The corner of Lake Boulevard and College Boulevard also sees a density increase in 2030.

2.6 Population Density

According to the US Census Bureau, the population of the City of Oceanside is 161,029 people. SANDAG estimates by the 2030, the City's population will increase by 29% to 207,237 people. Population density changes are reflected in neighborhoods, just east of Interstate 5 between State Route 76 and Oceanside Boulevard. Density increases to over 25 people per acre in many areas of these neighborhoods. Other areas that see an increase are along North Pacific Street, Vandergrift Boulevard, Jefferies Ranch, and along Oceanside Boulevard near College Boulevard. The population density increase follows the single-family residential increase patterns throughout the City.

2.7 Activity centers

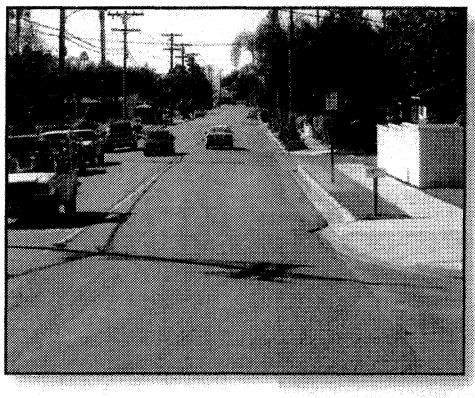
Activity centers such as shopping centers, parks, recreation centers and schools are dispersed throughout the City of Oceanside. Larger shopping centers are along Vista Way, Oceanside Boulevard, Mission Avenue and College Boulevard. The entire stretch along Coast Highway is predominantly commercial as it travels through downtown Oceanside.

As with many coastal cities, the beaches are one of the most popular destinations for both residents and tourists. Oceanside is no exception as it boasts eight beaches with amenities such as restrooms, picnic tables, playgrounds, barbeque grills and snack bars. Pier View South is Oceanside's most popular beach and holds many events throughout the summer including surfing and body boarding contests.

The City of Oceanside has one junior college, Mira Costa College and three high schools, Oceanside High, El Camino High and Ocean Shores High. Within the City there are eighteen elementary schools, five middle schools and four other educational institutions.

Fifty-two parks and golf courses can be found within the City limits which include some more parks currently in development. Many of these parks are neighborhood parks that attract children and families, which are major attractors for people on bicycles. There are currently two skate parks with two more in development.

Many of these activity centers can be accessed on bicycles. Many provide a place for bicycle parking while some do not.



California Street

2.8 Traffic Volumes

Average Daily Trips (ADTs) were plotted for the entire City to help determine existing conditions on the major roadways. The data was compiled into categories of zero to 5,000 at the lower end to a high end category of more than 40,000 ADTs.

Only four surface street segments routinely support traffic volumes exceeding 40,000 ADTs. Two are College Boulevard between Lake Boulevard and SR-78 and between Olive Drive and Oceanside Boulevard. The other two are a short stretch along Mission Avenue between Fireside Street and El Camino Real and El Camino Real between SR-78 and Via Las Rosas. The street segments that lead up to these sections all have high ADTs ranging from 20,000 to 30,000.

College Boulevard has the most consistently high traffic volumes as it travels in a north-south direction from SR-76 to Lake Boulevard. ADTs for College Boulevard are regularly above 30,000. Other major arterials with ADTs above 20,000 are El Camino Real, Mission Avenue, Oceanside Boulevard, Douglas Boulevard and Coast Highway.

2.9 Safety and security

Based on the City's Collision Report Summary, there have been 139 collisions involving bicyclists between 2004 and July of 2007. Of these collisions, 127 reported injuries with two fatalities. In 2004 there were 38 collisions, 41 in 2005, 42 in 2006 and 18 between January and July of 2007. The streets that have had the most bicycle related collisions are:

Coast Highway - 16
Pacific Street - 15
Mission Avenue - 8
Douglas Drive - 8
College Boulevard - 6
El Camino Real - 5
Oceanside Boulevard - 5
Old Grove Road - 5

These streets, with the exception of some segments of Coast Highway, do have bicycle facilities, mostly bike lanes. Coast Highway has a short segment of bike lane on the southern end of the City and Pacific Street is a Class 3 bike route. Coast Highway and Pacific Street are popular bicycle routes because of their proximity to the beach and commercial areas. Land use along Pacific Street is primarily single- and multi-family residential and a major thoroughfare for weekend bicyclists traveling along the San Diego County coast.

According to the summary, broadside collisions were the most common incidents, about 42 percent of all recorded collisions. An "Other" category is second with 35 percent, but the summary does not go into detail as to what "Other" entails.

The most common cause of collisions is when the motorist violates the bicyclist's right-of-way, which is about 24 percent of the time. "Unknown" and riding on the wrong side of the road are second at 16 percent, but the details of "Unknown" are not available. The City of Oceanside has put together a Bicycle Committee (BC) to oversee aspects of the bicycle master plan and other bicycle related issues in the City. They are also investigating in more detail these collisions from 2004 - 2007. Some preliminary findings are that motorists involved in a bicycle related collision have claimed that they "didn't see the cyclist." A detailed Bicycle Committee summary of the 2004 collisions states that thirty-five (35) of the car/bike collisions that occurred in 2004, fourteen (14) or fifteen (15) were the fault of the motorist and the other twenty (20) were the fault of the bicyclist. Eleven (11) of the collisions involved children under 18, of which eight (8) were the fault of the bicyclist. Twenty-four (24) involved adult bicyclists, twelve (12) of which were the fault of the bicyclists, and eight (8) of those twelve (12) were caused by the bicyclist riding the wrong way and/or on the sidewalk.

Despite the widely perceived danger of being hit from behind, only one (1) of the thirty-five (35) collisions was in this category, and it occurred after the bicyclist merged from the bike lane across two lanes of traffic into a left hand turn pocket.

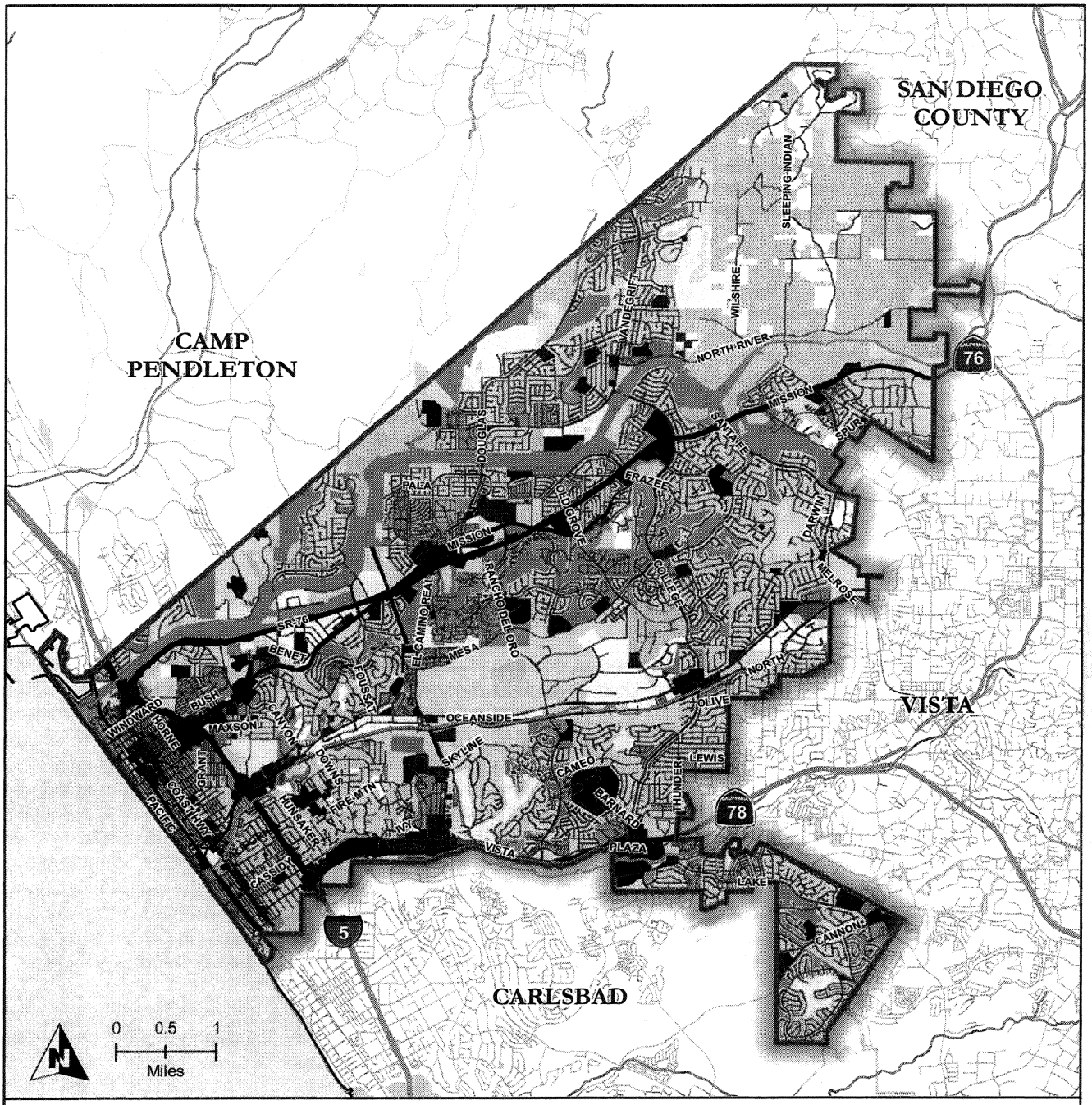


Figure 2.1 Existing Land Use

Existing Land Use (2006)

- Spaced Rural Residential
- Single Family Residential
- Multi-Family Residential
- Mobile Home Parks
- Group Quarters
- Hotel/Motel/Resort
- Light Industry
- Extractive Industry
- Junkyard/Landfill
- Airports
- Other Transportation
- Commercial
- Office
- Public Services
- Hospitals/Health Care
- Military
- Schools
- Recreation
- Parks and Open Space
- Agriculture
- Undeveloped Land
- Water Bodies
- Under Construction

Data Source: SANDAG (2006)

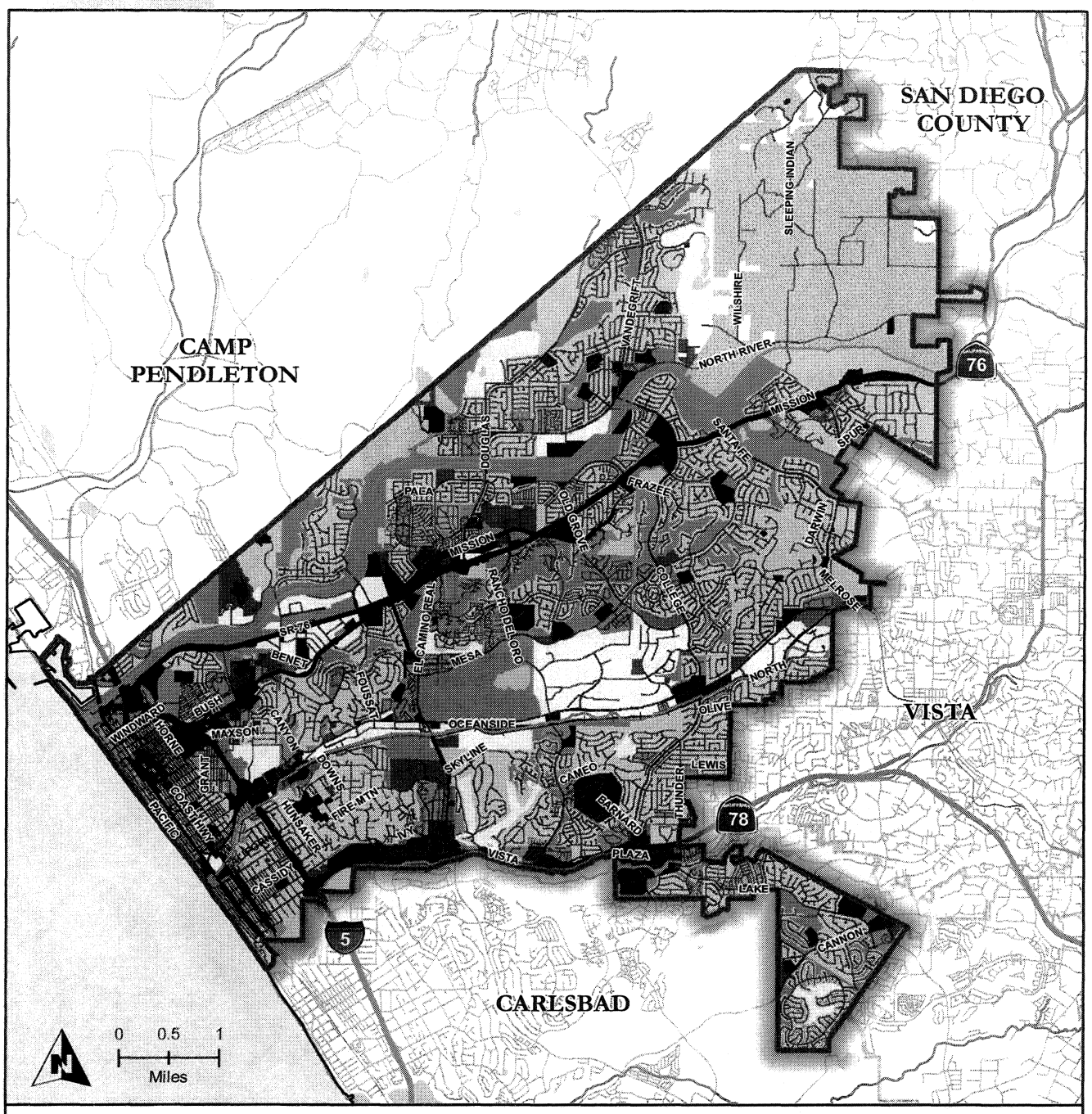


Figure 2.2 Planned Land Use

Planned Land Use

- Spaced Rural Residential
- Single Family Residential
- Multi-Family Residential
- Mobile Home Parks
- Group Quarters
- Hotel/Motel/Resort
- Light Industry
- Extractive Industry
- Junkyard/Landfill
- Airports
- Other Transportation
- Commercial
- Office
- Public Services
- Hospitals/Health Care
- Military
- Schools
- Recreation
- Parks and Open Space
- Agriculture
- Undeveloped Land
- Water Bodies
- Under Construction
- Mixed Use

Data Source: SANDAG (2006)

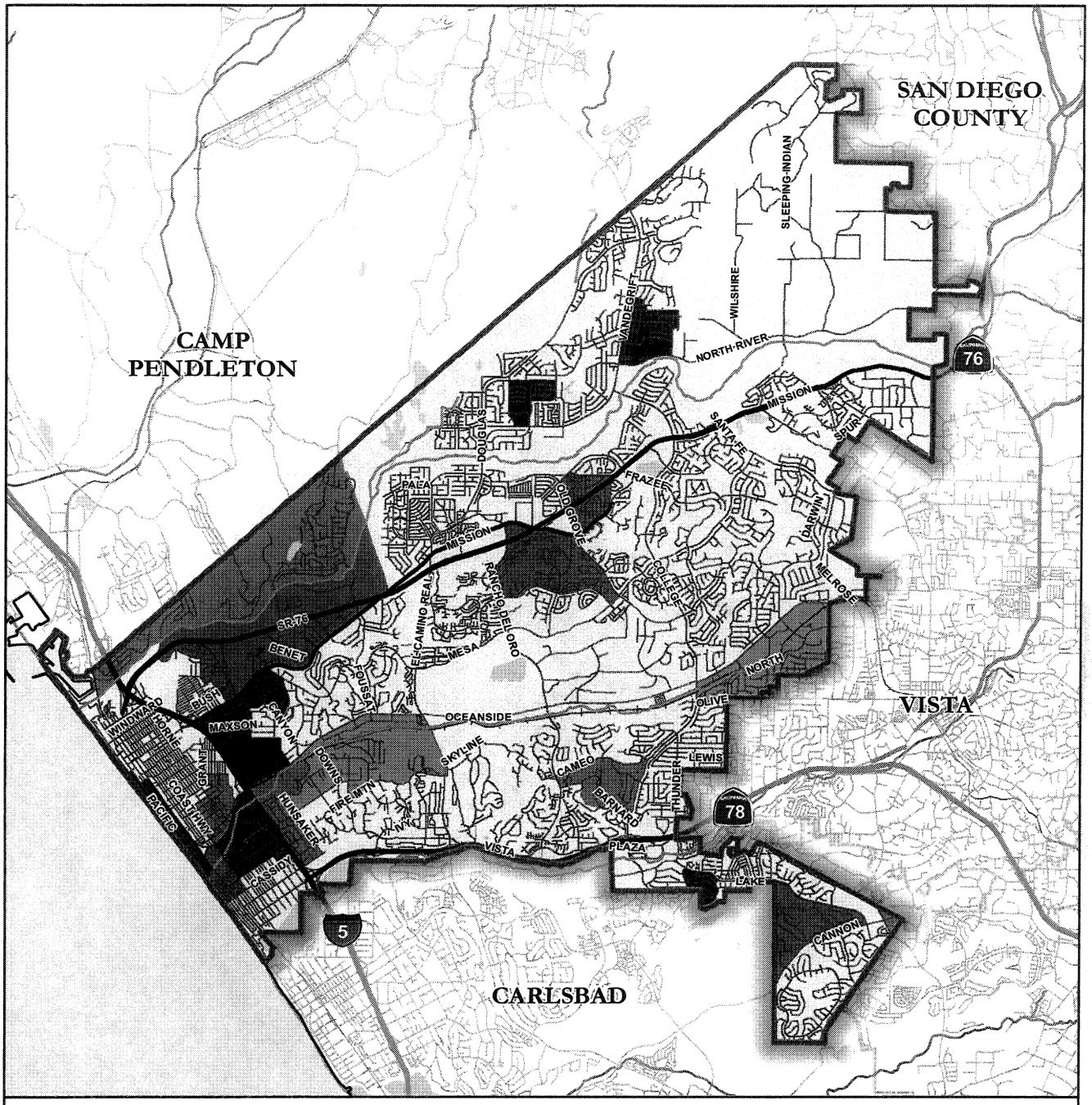
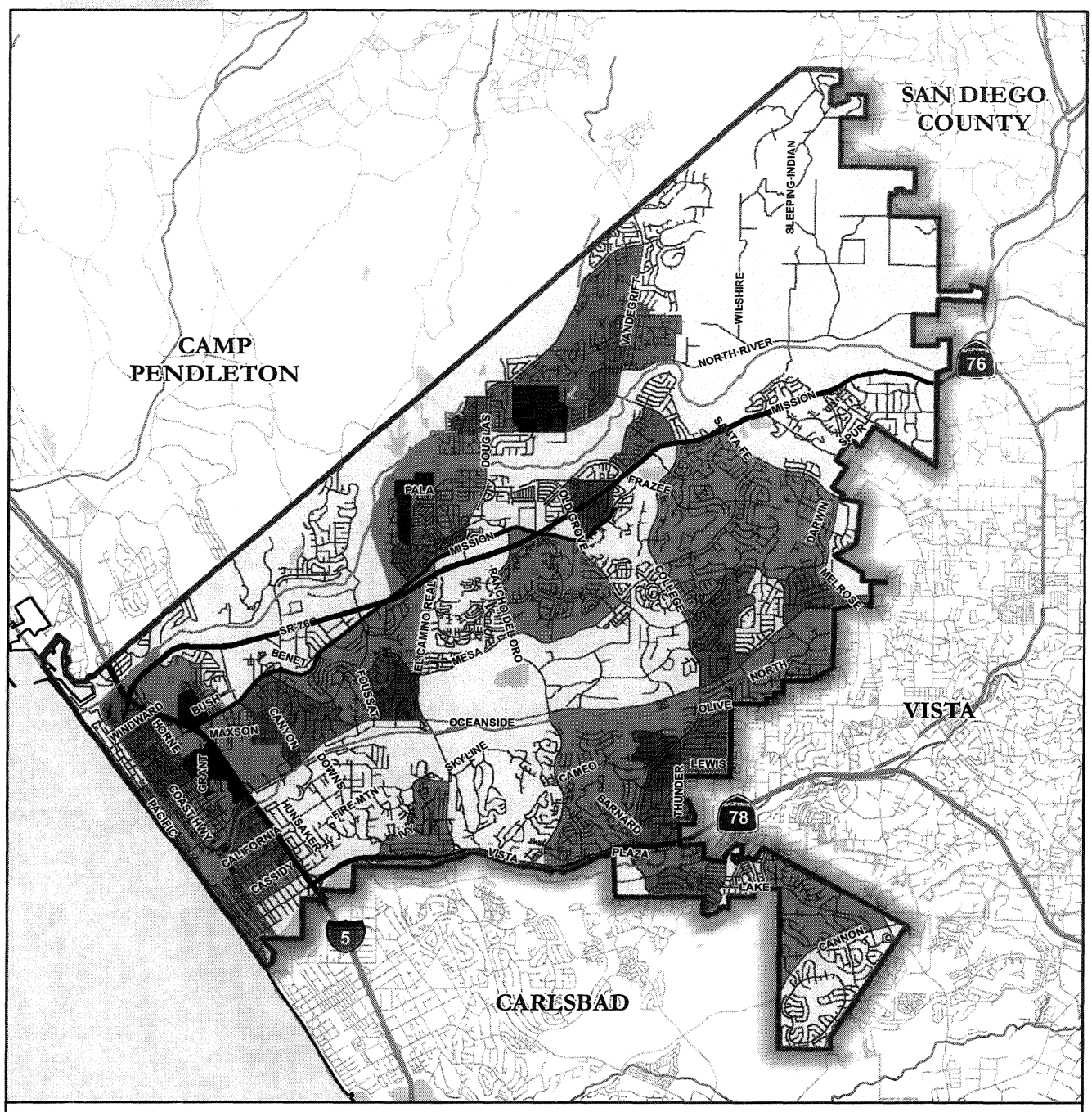


Figure 2.3 Bicycle Commuting



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

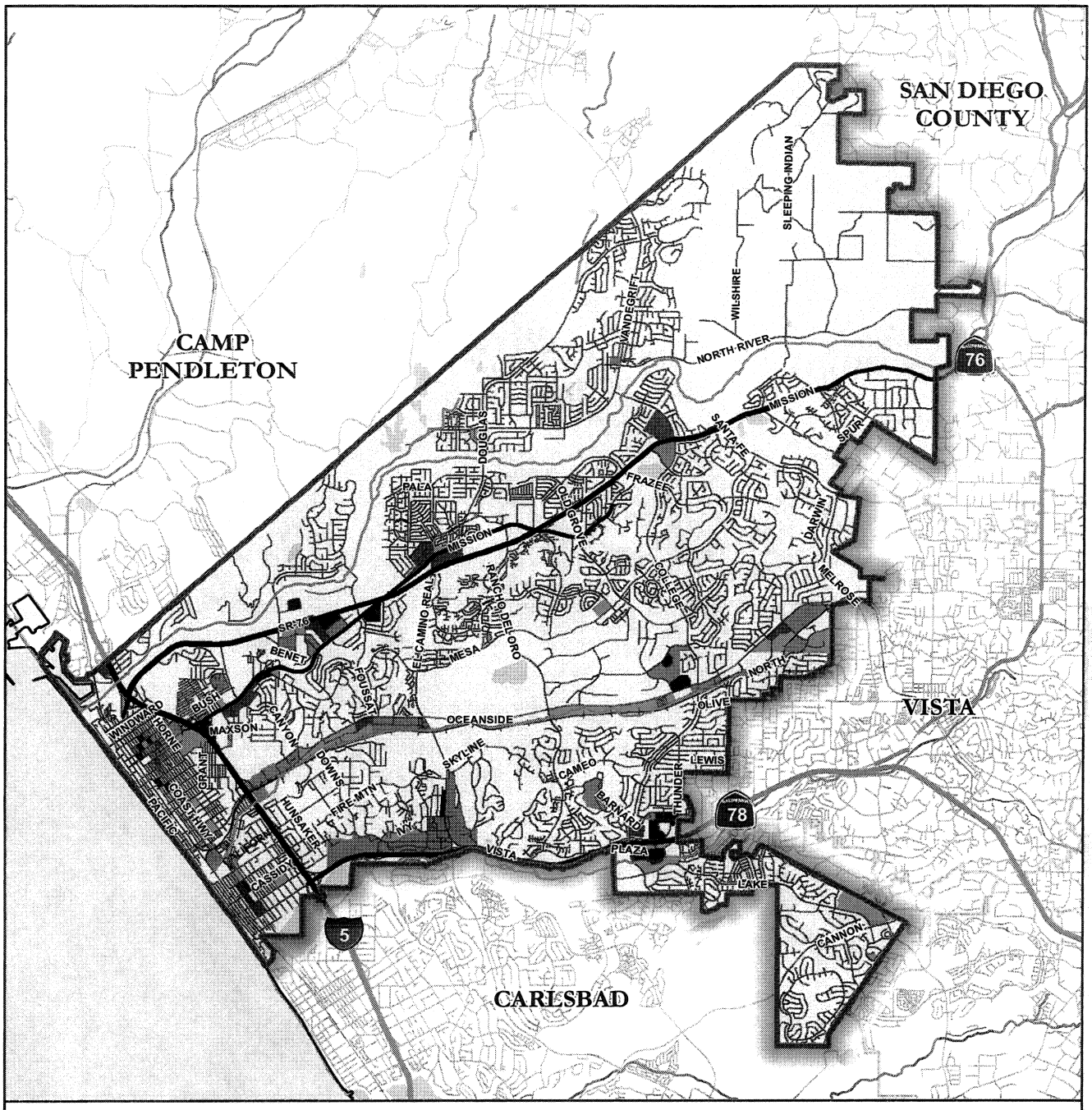
Under 16 years of age

< 1 (People per acre)
1 - 2
2 - 4
4 - 6
> 6

0 0.5 1
Miles

Data Source: SanGIS (2003)

Figure 2.4 Age Density Under 16 Years old



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

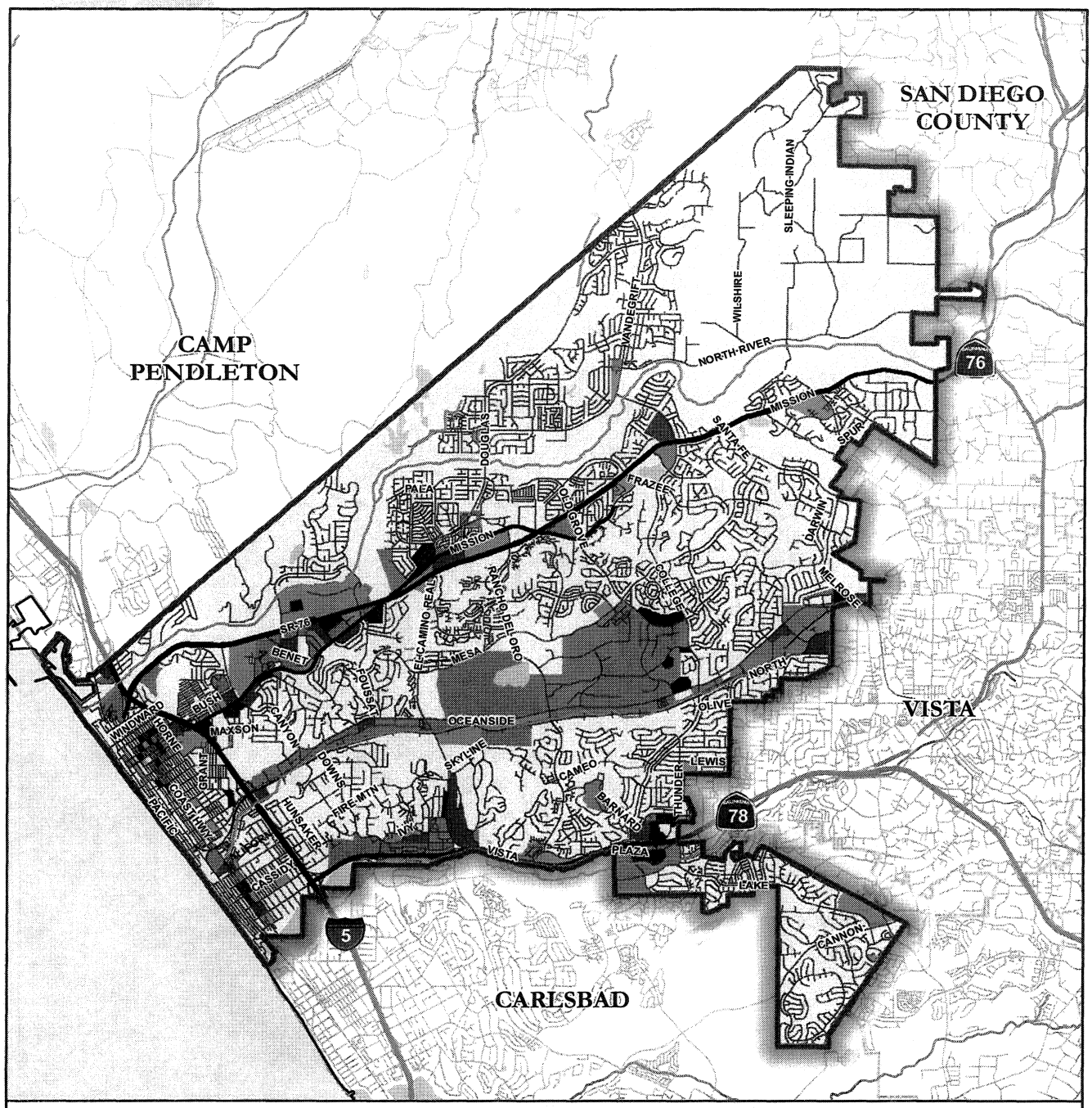
2000 Employment Density

<5 (People per acre)
5 - 10
10 - 15
15 - 20
20 - 25
> 25

0 0.5 1
Miles

Data Source: SANDAG

Figure 2.5 2000 Employment Density



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

2030 Employment Density

<5 People per acre
5 - 10
10 - 15
15 - 20
20 - 25
> 25

0 0.5 1
Miles

Data Source: SANDAG

Figure 2.6 2030 Employment Density

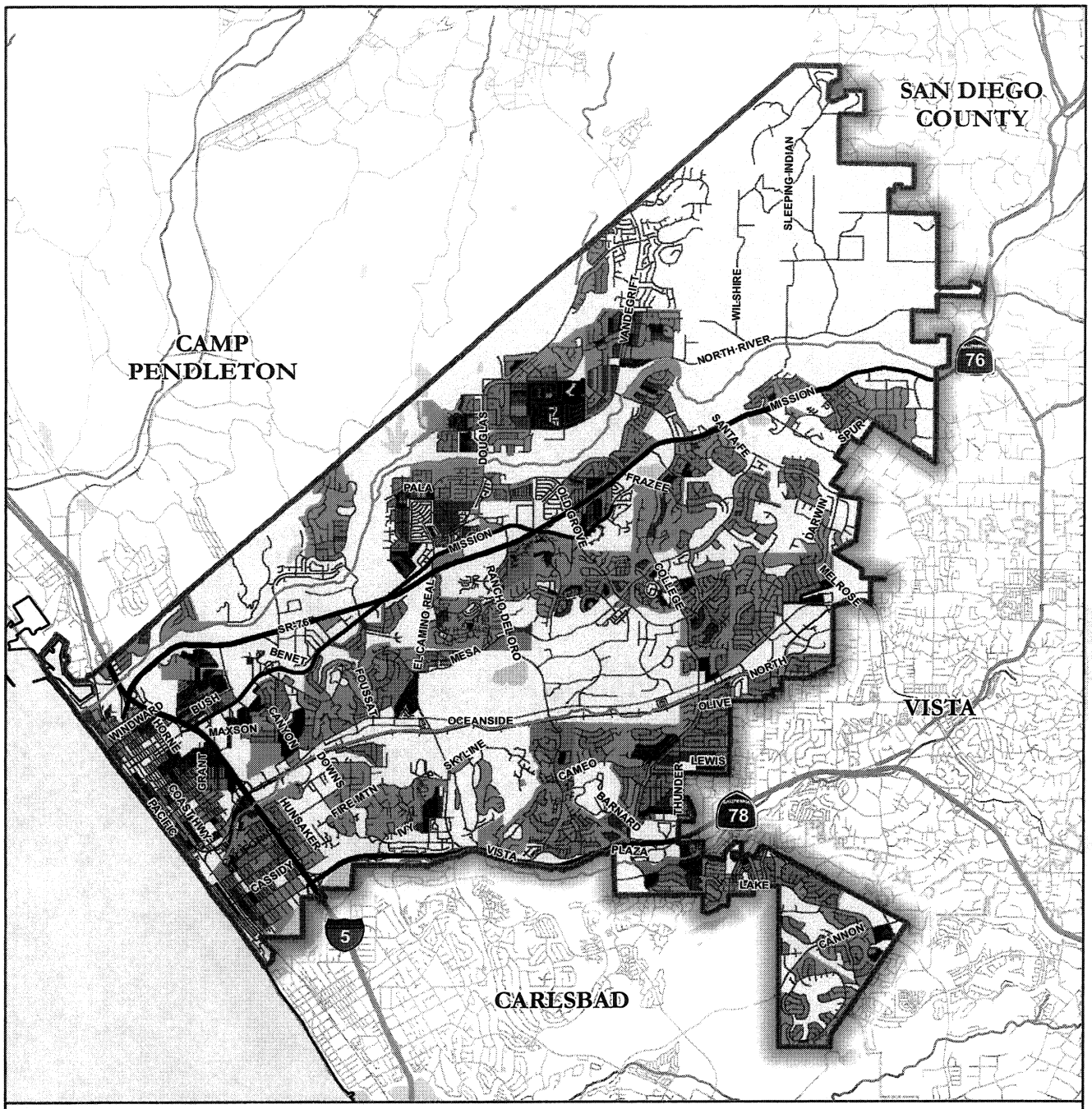
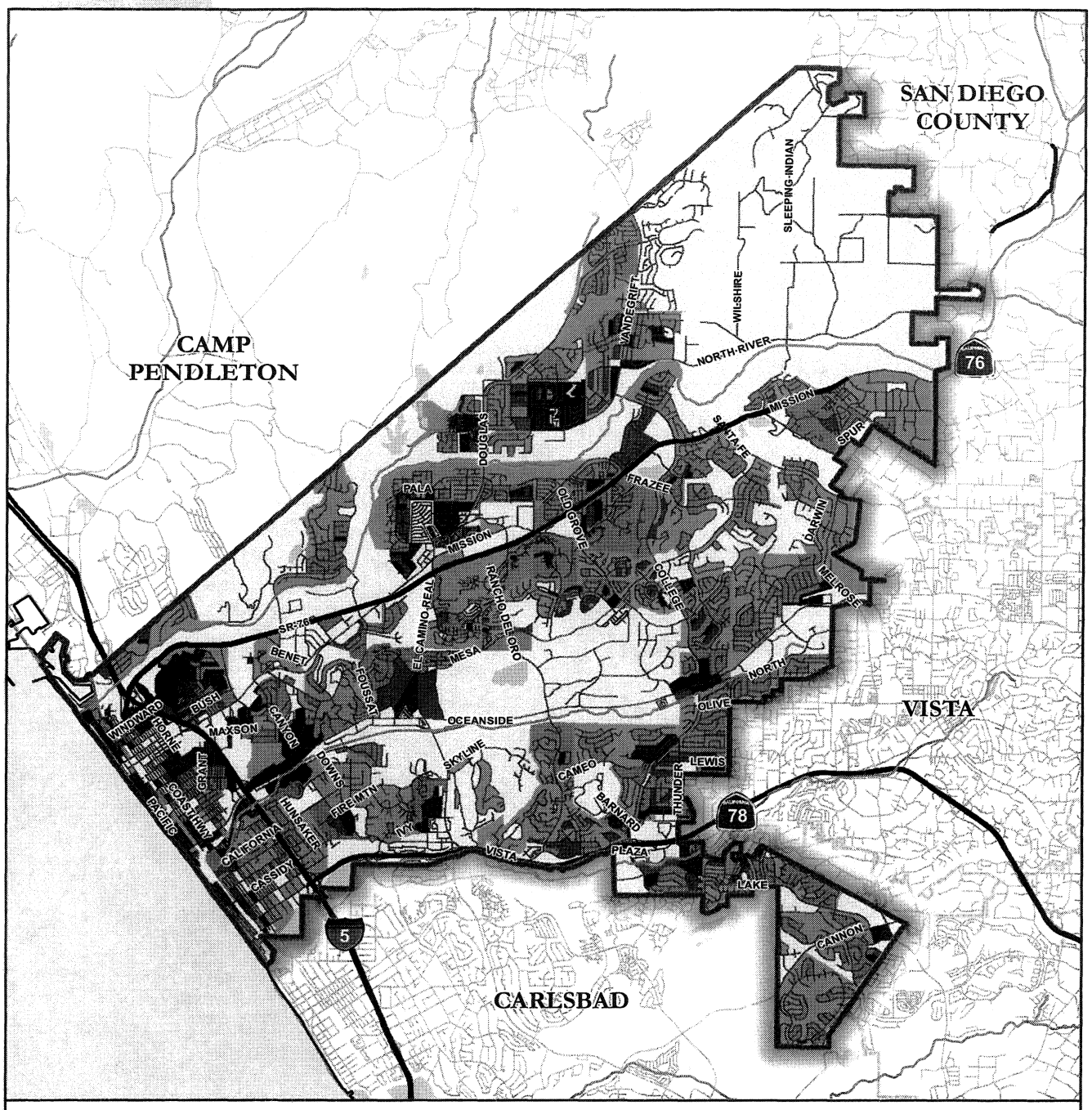


Figure 2.7 2000 Population Density



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

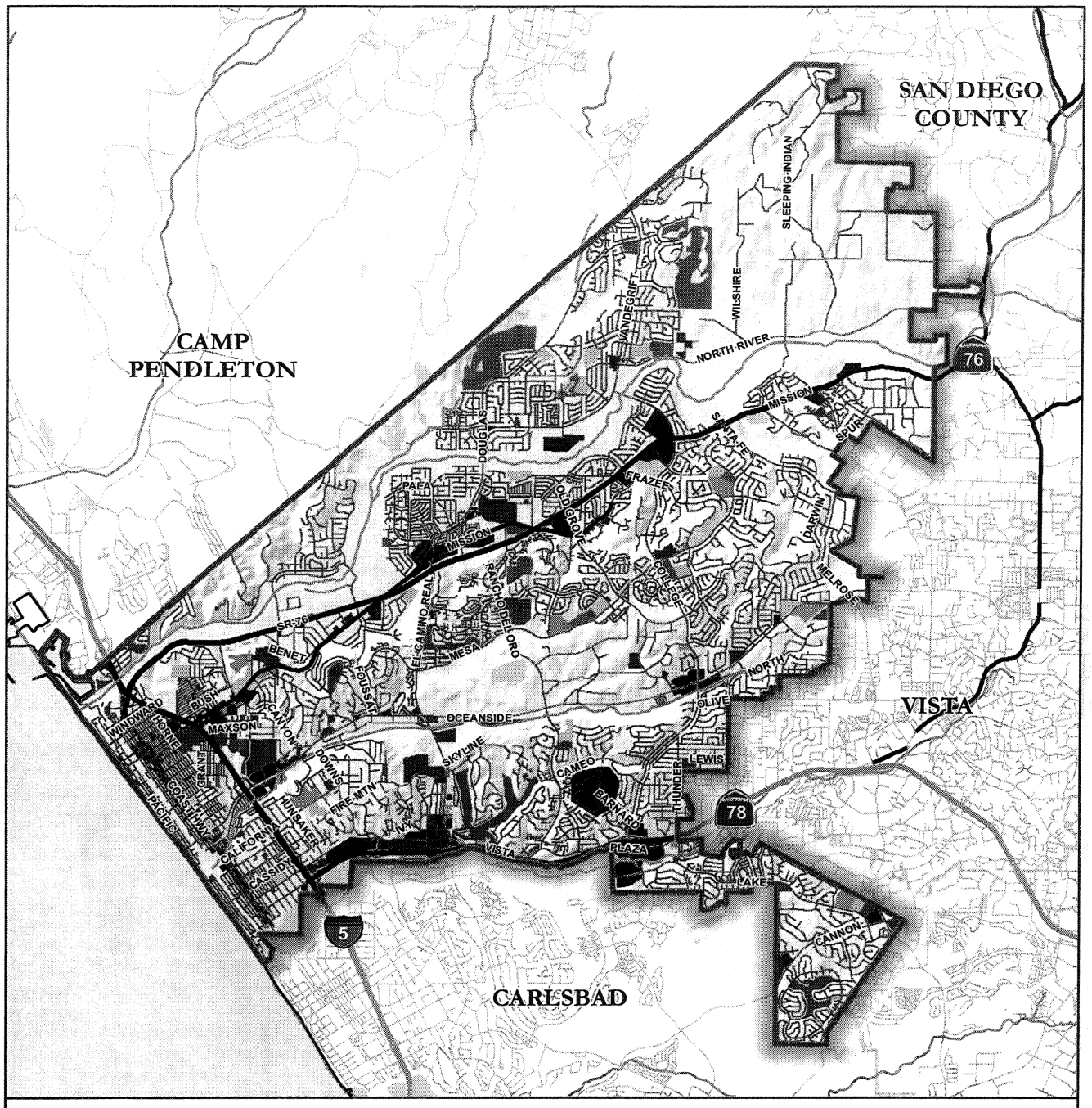
2030 Population Density

< 5 (People per acre)
5 - 10
10 - 15
15 - 20
20 - 25
> 25

0 0.5 1
Miles

Data Source: SANDAG

Figure 2.8 2030 Population Density



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

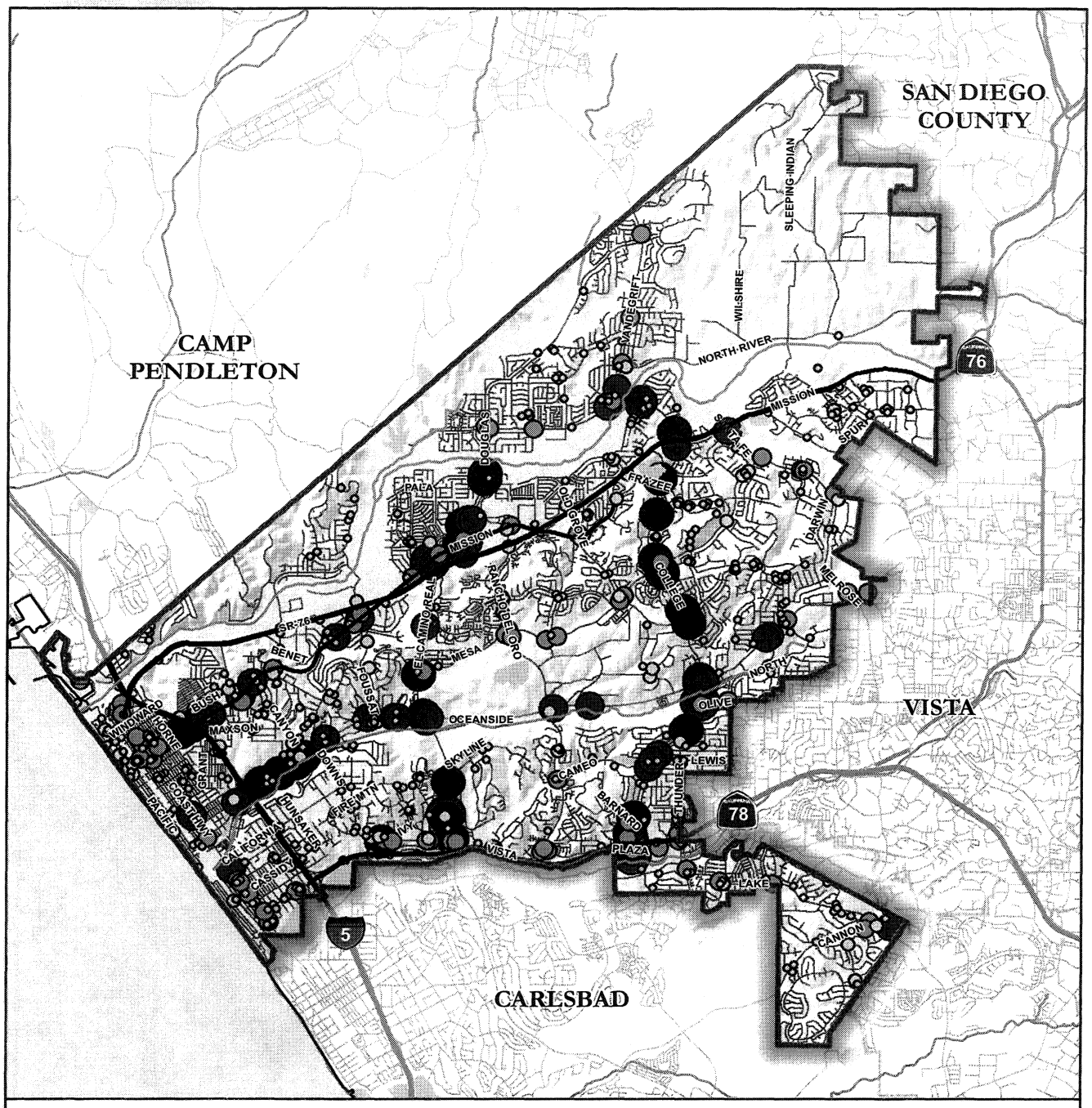
Activity Centers
Commercial
Office
Public Services
Hospitals/Health Care
Junior College
High Schools

Middle Schools
Elementary Schools
Other Schools
Commercial Recreation
Parks
Beaches

0 0.5 1
Miles

Data Source: SANDAG

Figure 2.9 Activity Centers



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

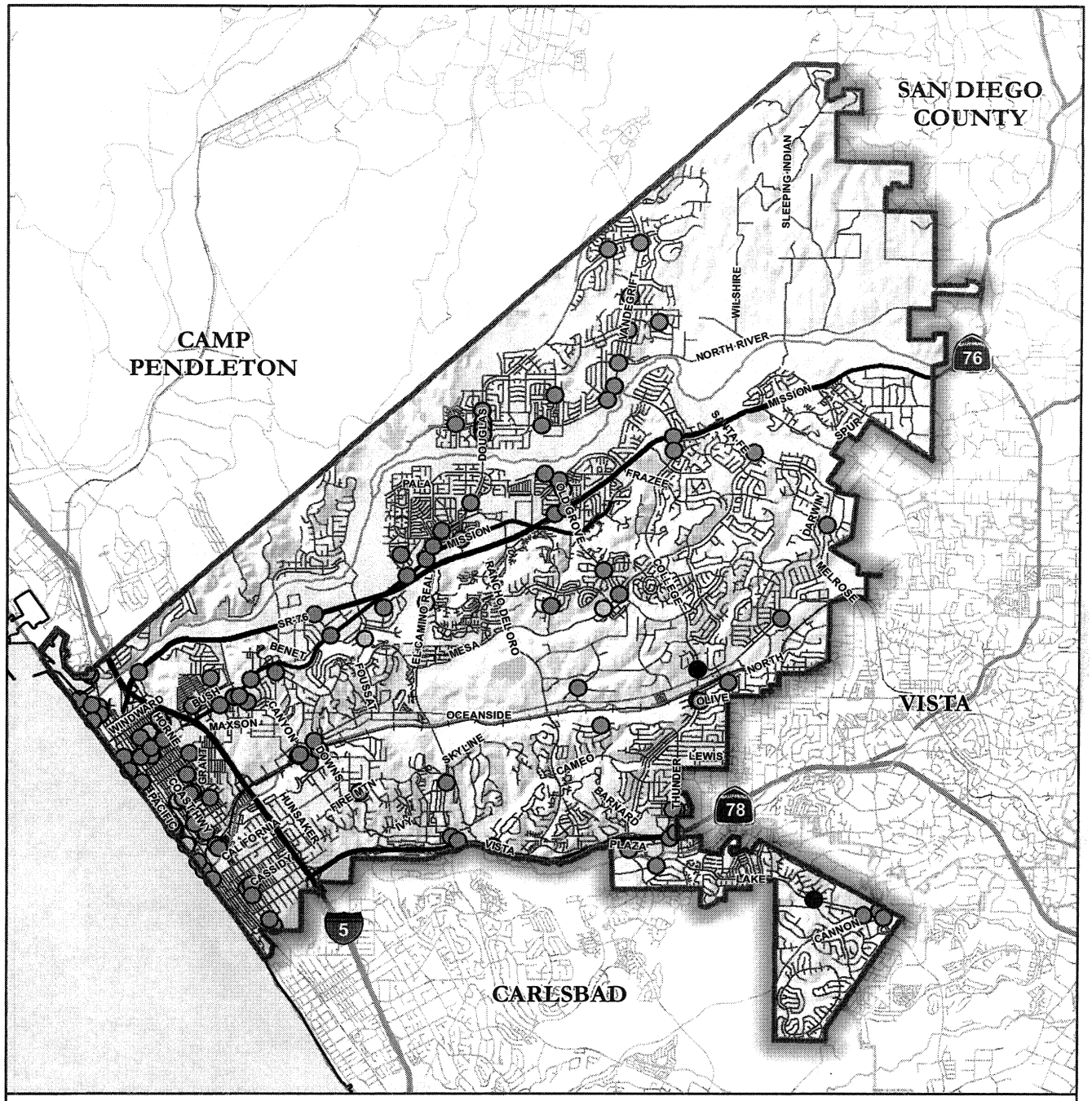
Average Daily Trips (ADT)

- 0 - 5,000
- 5,000 - 10,000
- 10,000 - 20,000
- 20,000 - 30,000
- 30,000 - 40,000
- > 40,000

0 0.5 1
Miles

Data Source: City of Oceanside (2005)

Figure 2.10 ADTs



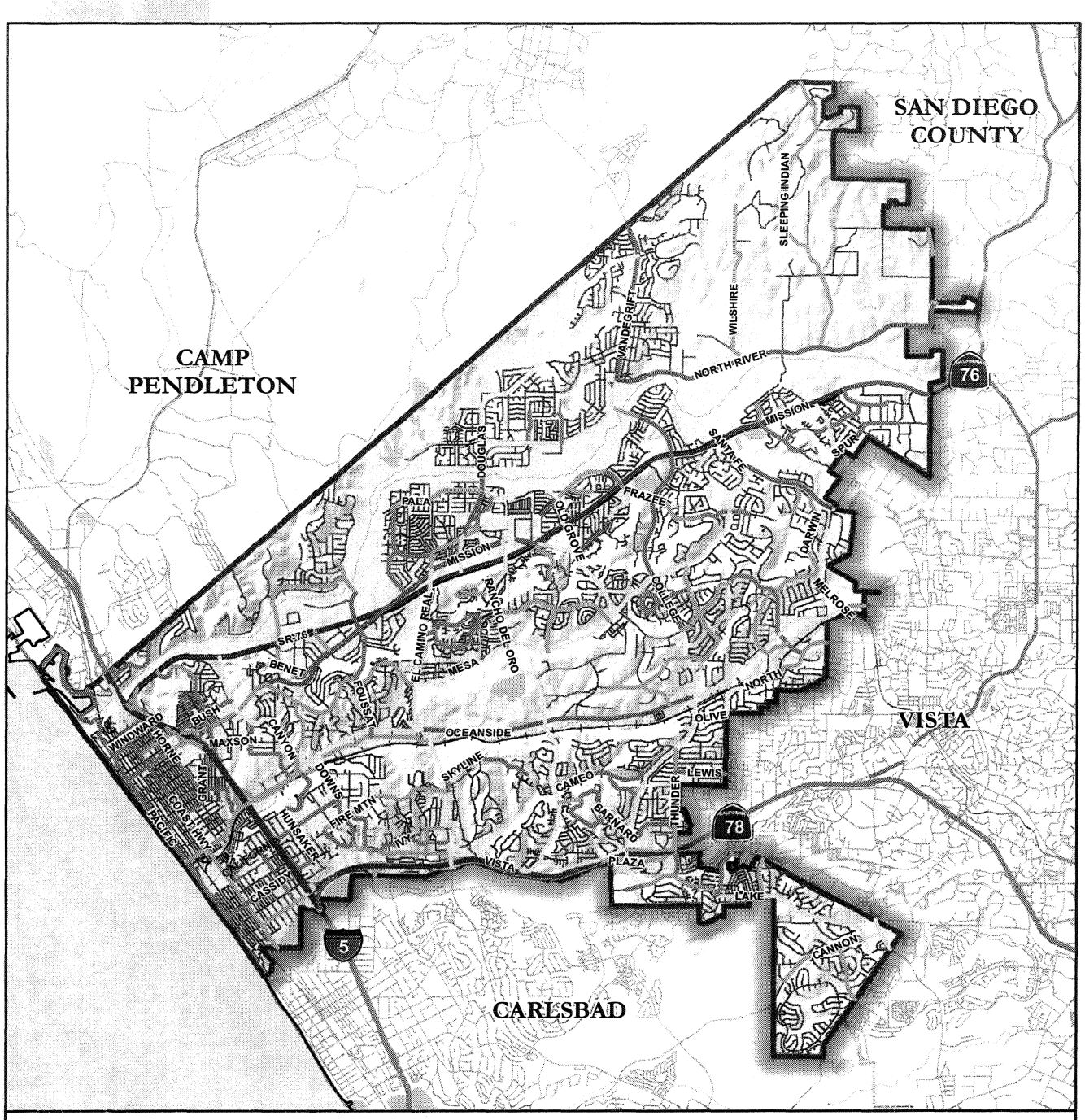
City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

Non-injury related collisions
Injury related collisions
Fatal collisions

Figure 2.11 Bicycle Collisions (2004-July 2007)

0 0.5 1
Miles

Data Source: City of Oceanside (2007)



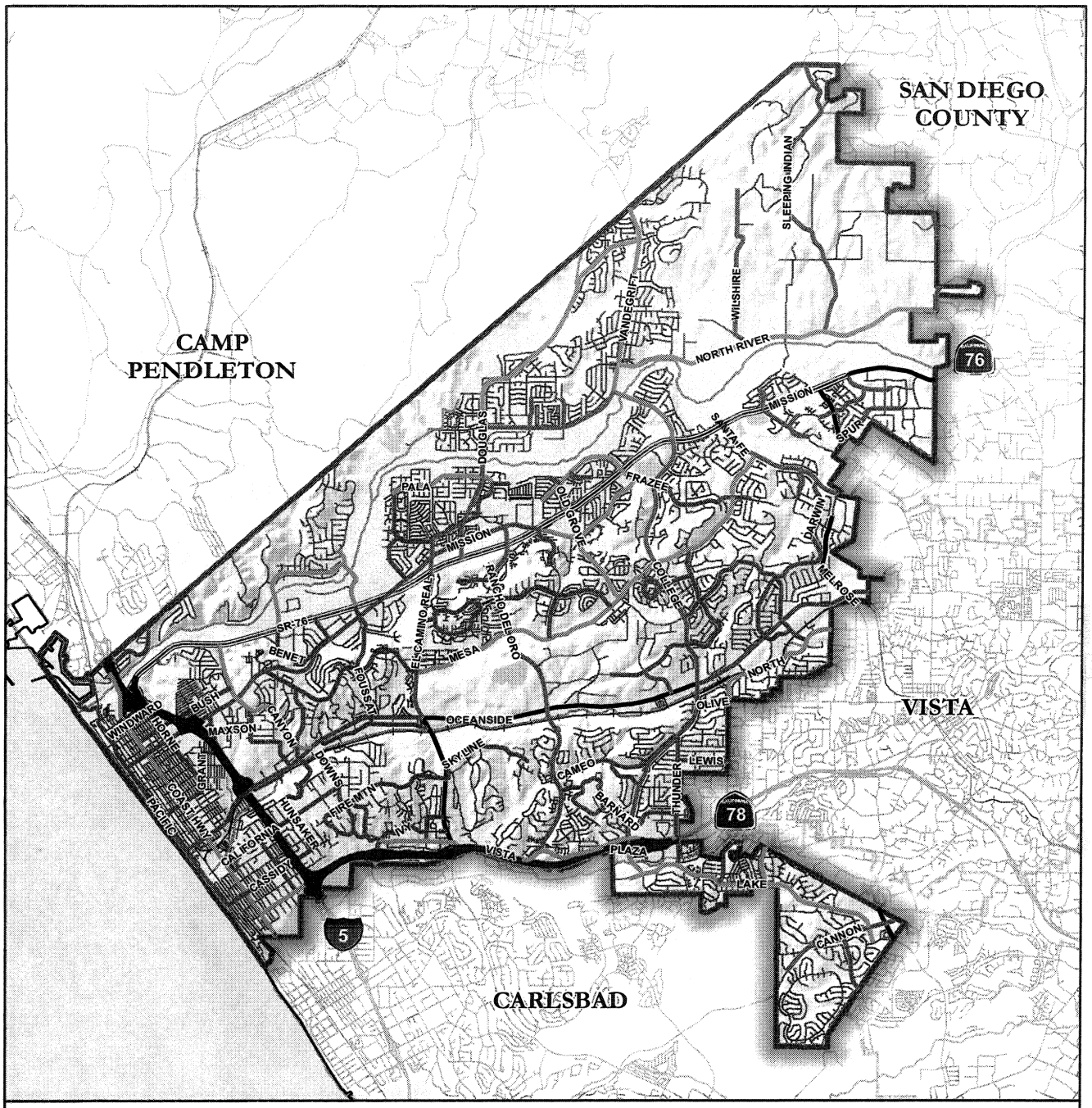
City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

Speed Limits
25 MPH
35 MPH
45 MPH
55 MPH
65 MPH

Figure 2.12 Speed Limits

0 0.5 1
Miles

Data Source: SANDAG Seriess 11 (2003)



City of Oceanside
Surrounding Cities
Roads
Rivers

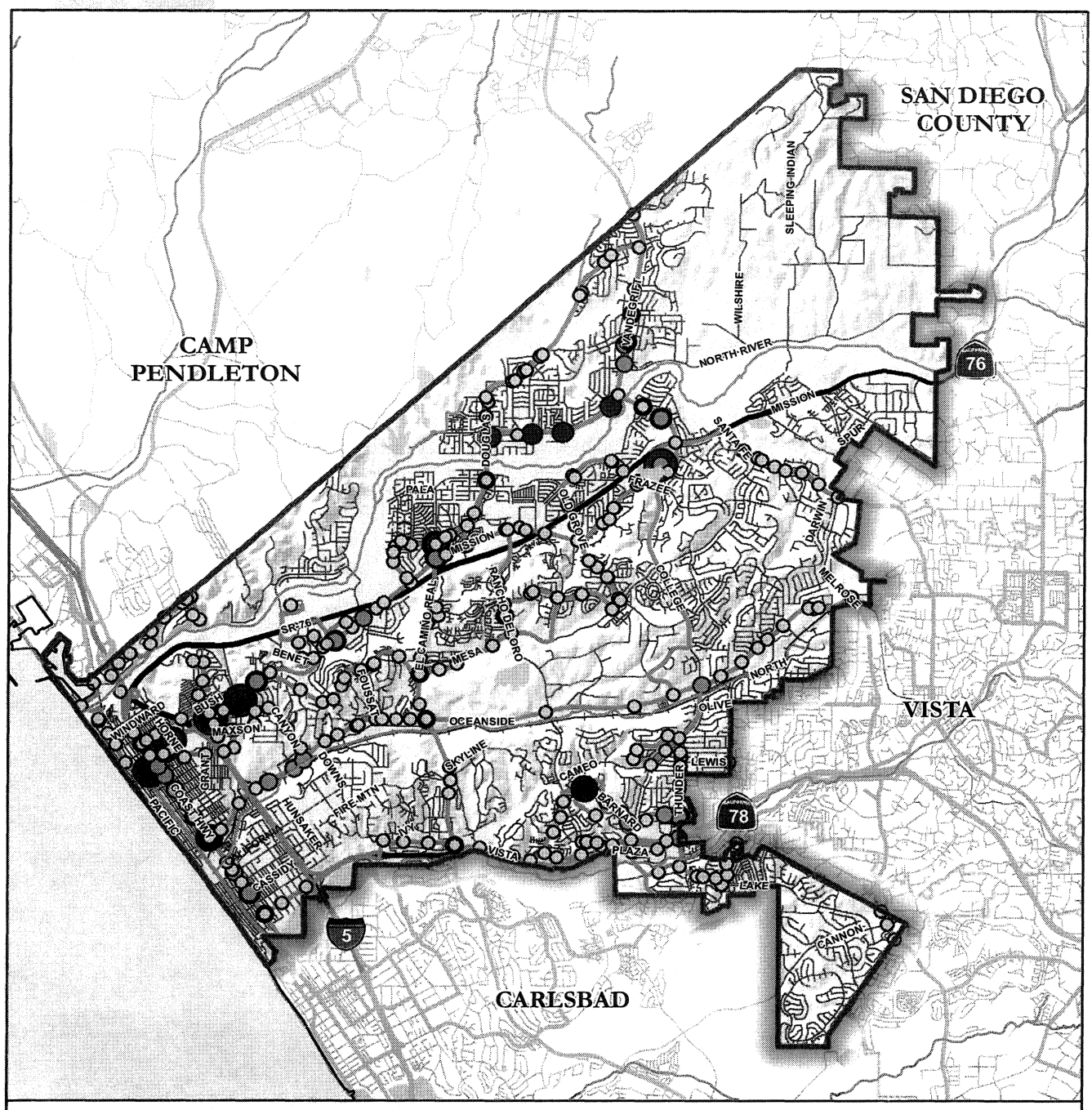
Circulation Element

Expressway
Freeway
Prime arterial
Major arterial - 6 lanes
Major arterial - 4 lanes
Secondary Arterial
Collector Road
Local road (Non-Circulation Element)

0 0.5 1
Miles

Data Source: SANDAG Seriess 11 (2003) / City of Oceanside Circulation Element - Existing Conditions

Figure 2.13 Street Classifications



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers
Bus Routes

Bus Stop Boarding and Alightings

- 0 - 50
- 51 - 100
- 101 -150
- 151 - 200
- > 200

0 0.5 1
Miles

Data Source: SANDAG (2007)

Figure 2.14 Bus Stop Boarding and Alightings

2.10 Existing bicycle facilities and major street segments

2.10.1 Downs Street

Lanes: 2
Existing bicycle facility: Class 3 Bike Route
Adjacent Land Use: Residential
Speed limit: 25-30 mph
Signage is not properly placed at the beginning of the route and there is no directional or destination signage. Downs Street has low traffic volumes with adequate width to accommodate a bike route.

2.10.2 California Street

Lanes: 2
Existing Bicycle Facility: Class 3 Bike Route
Adjacent Land Use: Residential
Speed Limit: 25 mph
Signage is not properly placed at the beginning of the route and there is no directional or destination signage. California Street has low traffic volumes with adequate width to accommodate a bike route and a bridge crossing over I-5 with only a northbound on-ramp.

2.10.3 Morse Street

Lanes: 2
Existing Bicycle Facility: Class 3 Bike Route
Adjacent Lane Use: Residential
Speed Limit: 25 mph
Morse Street is a short segment with no signage at California Street and Coast Highway indicating it is a bike route.

2.10.4 Fire Mountain Drive

Lanes: 2
Existing Bicycle Facility: Class 3 Bike Route
Adjacent Land Use: Residential
Speed Limit: 30 mph
Fire Mountain Drive is primarily adjacent to residential land use with some commercial at the intersection of El Camino Real. Signage is not properly placed at the beginning of the route with no directional or destination signage. It has low traffic with adequate roadway width to accommodate a Class 3 route.

2.10.5 Foussat Road

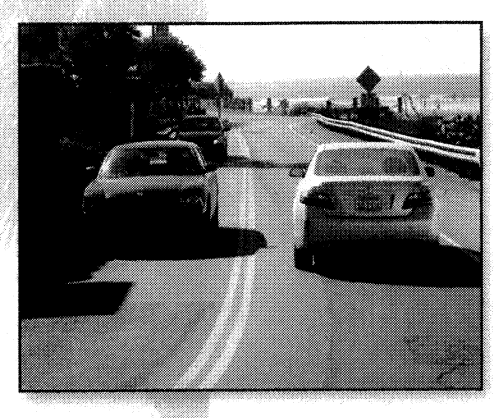
Lanes: 2
Existing Bicycle Facility: Class 3 Bike Route and a programmed Class 2 bike lane between Mission Avenue and Benet Road.
Adjacent Land Use: Primarily residential with some open space and commercial
Speed Limit: 20-35 mph
There is limited signage and when present, not at the beginning of the route. Primarily low traffic as it's adjacent to mostly residential land use.

Eastbound North River Road

2.10.6 North River Road

Lanes: 2-4
Existing Bicycle Facility: A Class 2 Bike Lane and a Class 3 Bike Route and a programmed Class 2 Bike Lane throughout
Adjacent Land Use: Rural residential and agriculture
Speed Limit: 45-50 mph
Bike lanes exist between Vandergrift Boulevard and Stallion Road before it turns into a bike route. Very little to no shoulder available to

allow a buffer between bicyclists and vehicles except for a few short sections where wider shoulders are present. Speeds are quite high with many blind turns and large trucks traveling this route. This road is a highly utilized route for bicyclists entering Oceanside from Bonsall and SR-76. Road conditions are very poor with glass and potholes on both lanes of the road.



Pacific Street

2.10.7 Pacific Street

Lanes: 2
Existing Bicycle Facility: Class 3 Bike Route
Adjacent Land Use: Primarily residential with some commercial
Speed Limit: 25 mph
Signage exists, but is inadequate since only two intersections (Wisconsin and Surfrider) have bike route signs and no directional signage. The speed of most vehicles is moderate with parallel parking throughout and residential driveways. The lanes are about eight feet wider north of Wisconsin Avenue than south of Wisconsin Avenue. This route is heavily used by bicyclists traveling north-south along the coast and to access the beach and downtown areas. Northbound Pacific Street, as it crosses the San Luis Rey River, is narrow with no shoulder on the blind turn towards the coast. There is not enough room to distance bicyclists from a passing vehicle. A new bridge on North Pacific Street is under construction and will have striped Class 2 bike lanes.

Shared Lane symbols or "Sharrows" have been installed on Pacific Street in addition to the current signage.

2.10.8 Sleeping Indian Road

Lanes: 2
Existing Bicycle Facility: None
Adjacent Land Use: Rural residential and agriculture
Speed Limit: 25 mph
This road is primarily a low speed rural residential road, but is occasionally traversed by larger vehicles such as semi trucks and delivery trucks that access the agricultural areas. Sleeping Indian Road is programmed to be a Class 3 bike route.

The Strand

2.10.9 The Strand

Lanes: 1-2
Existing Bicycle Facility: None
Adjacent Land Use: Beach, residential and some commercial
Speed Limit: 15 mph
The southbound section is only one-way for cars from the Oceanside Pier to Wisconsin Avenue with a speed limit of 15 mph. Numerous bicyclists and pedestrians can be found riding and walking northbound on the lane if cars are not present. From the Pier northwards, it becomes a two-lane road accessing multi-family residential and beach rental property.

2.10.10 Oceanside Boulevard

Lanes: 2-6
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Industrial and commercial
Speed Limit: 25-55 mph
Bike lanes are present throughout with good signage at intersections. Bike lane striping is non-existent on the eastbound lane past the shopping center at the corner of College Boulevard. Signage exists, but the striping does not. Driveways into the shopping center intersect the street where the striping is missing.

2.10.11 Rancho Del Oro Drive

Lanes: 4
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Residential, commercial and industrial
Speed Limit: 45 mph

Rancho Del Oro Drive is a north-south arterial through the center of the City. Bike lanes are present throughout except between the Sprinter tracks and Oceanside Boulevard. There is adequate room for bike lanes and striping is all that is needed to connect the bike lane segments. Rancho Del Oro Drive does not connect with SR-78 and terminates at Vista Way. The intersection of Rancho Del Oro Drive and Ocean Ranch Drive does not have appropriate striping for a Class 2 bike lane through the intersection. The bike lane is striped on the right side of the right-turn only lane.

2.10.12 Melrose Drive

Lanes: 2-4
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Residential
Speed Limit: 40-45 mph

There are adequate bike lanes throughout until the intersection with Santa Fe Avenue. The bike lanes do not continue to the intersection and instead end at Sagewood Drive approximately a quarter-mile before the intersection. Just south of Oceanside Blvd there seems to be two southbound bike lanes although the inner-most lane is marked as a bike lane while the outer lane is striped like a bike lane as well.

2.10.13 North Santa Fe Avenue

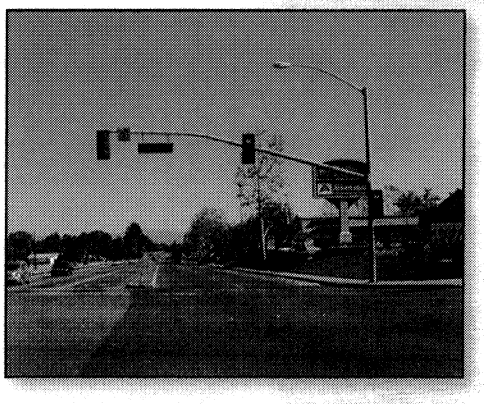
Lanes: 2-4
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Residential
Speed Limit: 50 mph

There is a short horse trail adjacent to northbound lanes on Santa Fe Avenue dead ends at Mission Avenue. Guajome County Park Lower Picnic Area is located on Sante Fe Avenue. There are adequate bike lanes throughout this street with residential the primary adjacent land use.

2.10.14 Mission Avenue

Lanes: 4
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Mix of residential, industrial and commercial
Speed Limit: 25-50 mph

Mission Avenue has width adequate bike lanes, which end at Saddleridge Road just before the eastern City limit. This road is a major arterial with high speeds and busy intersections and is a major east-west connection.



Mission Avenue and El Camino Real

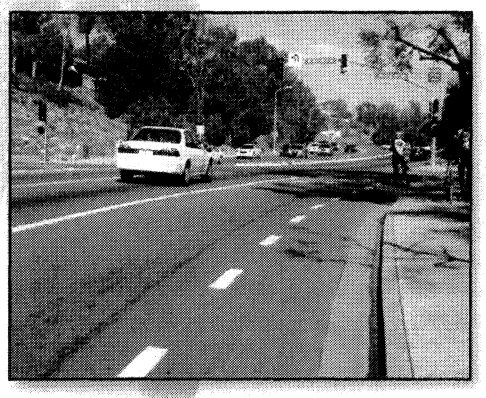
2.10.15 Mesa Drive

Lanes: 2-4
Existing Bicycle Facility: Class 3 Bike Route and Class 2 Bike Lanes
Adjacent Land Use: Residential
Speed Limit: 30-45 mph

Mesa Drive is a combination of Class 3 bike routes and Class 2 bike lanes. This east-west connection travels through the center of the City and is primarily adjacent to residential land use and some open space. The Class 3 section of this route is located in the western end of the City just south of Mission Avenue and then converts to Class 2 bike lanes at Foussat Road until its terminus at Santa Fe Avenue.

2.10.16 Barnard Drive

Lanes: 2
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Single and multi-family residential
Speed Limit: 25 mph
This segment connects College Boulevard with Mira Costa College.



College Blvd and Waring Rd

2.10.17 College Boulevard

Lanes: 4-6
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Single and multi-family Residential and commercial
Speed Limit: 45+ mph
College Boulevard has bike lanes throughout with a mix of residential and commercial land uses. This road is one of the major north-south connections on the east side of the City. The easternmost access point of the San Luis Rey River Trail is at the northern end of College Boulevard just south of North River Road. Just north of Oceanside Boulevard is an intersection where northbound vehicles have access to the Rancho Del Oro shopping center on the southbound side. A left turn lane allows vehicles to cross the southbound lanes and into the driveway of the Rancho Del Oro shopping center. A "Keep Clear" zone in the southbound lanes allows left turning vehicles to cross the lanes and enter the shopping center. During commuting times, the lanes are full of traffic and cyclists riding the bike lane towards Oceanside Blvd are not visible to oncoming traffic turning into the shopping center. Southbound vehicles block views of the cyclist traveling in the bike lane. The southbound lanes are on a downhill grade and cyclist and motorists can pick up speeds along this section of road.

A cyclist has been killed at this intersection. The undercrossing at SR-78 is quite confusing and signage non-existent as to where the lanes are going. It does not help cyclists to decide ahead of time which lane they need to take to make it across SR-78.

2.10.18 Lake Boulevard

Lanes: 2-4
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Residential
Speed Limit: 35+ mph
From College Blvd, the eastbound bike lane actually begins at Esplanade Street while the westbound connects to College Boulevard. There are bike lanes throughout with adjacent street parking on the residential sections of the road. At the Thunder Road intersection the bike lane is currently located on the right side of right-turn-only lane.

Southbound El Camino Real

2.10.19 El Camino Real

Lanes: 2-4
Existing Bicycle Facility: Class 2 Bike Lanes south of Mesa Drive
Adjacent Land Use: Open space, commercial and residential
Speed Limit: 45+
Bike lanes exist in both northbound and southbound directions between SR-78 and Mesa Drive. A bike lane is present only on the northbound side between Mesa Drive and Mission Blvd. A Class 3 bike route begins at the Douglas Drive intersection and travels through Heritage Park to Old Grove Road. Bike route signs are non-existent throughout this section of El Camino Real, but present through Heritage Park. Between Mission Avenue and Mesa Drive, there are no shoulders to accommodate bicyclists on the southbound lanes and is mostly a climb. Portions of the southbound lanes have a raised curb on the edge of

the road with dirt on the other side before the hillside drops off, leaving little to no room for a safe buffer between vehicles and bicyclists.

2.10.20 Douglas Drive

Lanes: 2-4
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Open space, residential and commercial
Speed Limit: 35+ mph
Bike lanes exist throughout Douglas Drive from Mission Avenue to Vandergrift Boulevard. Based on crash data recorded between 2004-2007, there have been four bicycle related collisions at the corner of Douglas Drive and North River Road. The northbound lanes at this intersection have one left, two straight and two right-turn-only lanes with the rightmost turn lane being excessively wide. The bike lane on northbound Douglas Drive before North River Road ends at the beginning of the shopping center parking lot, which is located at this intersection. There is no bike lane to allow bicyclists to travel through the intersection. The bike lanes that travel east, west and south from Douglas Drive all have adequate signage.

2.10.21 Coast Highway

Lanes: 2-4
Existing Bicycle Facility: Some Class 2 Bike Lanes
Adjacent Land Use: Commercial
Speed Limit: 25-45 mph
Northbound from Morse Street to Oceanside Blvd, bike lanes are present which then end and become a wide two lane road with parallel parking. The road is wide enough to potentially add bike lanes to continue until the road narrows. From Wisconsin northward, the road narrows with parallel parking along commercial land use. Coast Highway is a four-lane roadway up to the bridge over the San Luis Rey River where it then becomes two lanes.

2.10.22 Vista Way

Lanes: 2-4
Existing Bicycle Facility: Class 2 Bike Lanes east of I-5, Class 3 Bike Route from Jefferson Street to Magnolia Court
Adjacent Land Use: Residential, commercial and industrial
Speed Limit: 25-45 mph
Vista Way runs parallel to State Route 78 from the coast to the City of Vista. Bike lanes are present between Jefferson Street and the City of Vista. Land use in this section consists of a mix of multi-family residential, shopping malls and some industrial parks. At the intersection of El Camino Real, the bike lanes do not continue through the intersection. Between I-5 and Coast Highway, this section of Vista has high ADTs due to SR-78 terminating on at I-5 and becoming Vista Way. This section is primarily residential with street parking and a median.

Westbound on Jefferson Street, a bike route is designated that travels adjacent to the Pacific Coast Plaza. This 2-4 lane road is primarily access into the shopping center as it terminates into the parking lot. The bike route travels through the shopping center parking lot between Wal-Mart and Best Buy and connects to a paved access road which ends at Magnolia Court. From Magnolia Court, the bike route continues on Bayberry Drive then onto Cassidy where it currently ends.

2.10.23 Vandergrift Boulevard

Lanes: 4
Existing Bicycle Facility: Class 2 Bike Lanes
Adjacent Land Use: Residential, commercial and undeveloped
Speed Limit: 55 mph
Vandergrift Boulevard is a continuation of North River Road as it travels north into Camp Pendleton. Bike lanes exist throughout as it primarily accesses residential neighborhoods and some agriculture. Access to Arrowood Golf Course and Luiseno Park is through Vandergrift Boulevard.

2.11 San Luis Rey River Trail

Existing Bicycle Facility: Class 1 Bike Path

Adjacent Land Use: Open Space

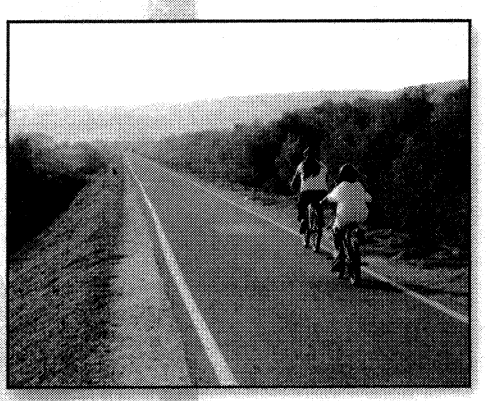
Distance: 7.2 miles (one way)

San Luis Rey River Trail at I-5

The San Luis Rey River Trail has an excellent surface throughout, but does not have the two foot shoulders required of Class 1 paths because of limited space on the levee. There are five intersections along the San Luis Rey River Trail. There is also neighborhood access to the trail via a bridge from Cypress Road. No shade structures and restroom facilities were present at any of these access points. These intersections or access points are Neptune Way, the westernmost entrance, Benet Road, Foussat Road, Douglas Drive and College Boulevard, the easternmost entrance.

2.11.1 Access #1: Neptune Way

This neighborhood access point was difficult to find. The lack of signage directing users to the trail head will make it difficult for first time trails users to locate it. An NCTD "No Trespassing" sign at the bike path entrance could lead some to believe they are trespassing and possibly discourage users from getting onto the path as it parallels the railroad tracks. The bike path begins wide and then narrows slightly as it travels alongside the river where striping and arrows are present at blind turns under I-5. An information kiosk is present at this access point.



San Luis Rey River Trail at Douglas Blvd

2.11.2 Access #2: Benet Road

This access point lies just west of the Oceanside Municipal Airport. No parking is available at this location, but an information kiosk, benches and trash receptacle were present.

2.11.3 Access #3: Foussat Road

The Foussat Road access point has a parking lot at the corner of Foussat Road and Alex Road. An information kiosk, trash receptacles and benches are also present at this access point.

2.11.4 Access #4: Douglas Boulevard

On the southbound side of Douglas Boulevard there is an unpaved parking lot with an information kiosk, trash receptacle and a bench. The northbound entrance also has these amenities minus the parking lot. Entrance to the parking lot can only be accessed from the southbound lanes. Access to the parking lot is not available when traveling north. To safely access the lot and trail, users must travel to North River Road, turn around and head south and then turn right into the lot at the Douglas bridge overpass. Entrances onto the bike path are wide and signed appropriately.

2.11.5 Access #5: Cypress Road Bridge

This bridge accesses the neighborhood along Cypress Road between Douglas Boulevard and College Boulevard. There are no amenities at this location since it just acts as an access point to and from the adjacent neighborhood. There is signage notifying bicyclists of the bike trail on Cypress Road.

2.11.6 Access #5: College Boulevard

This easternmost access has a parking lot on the southbound side. Northbound travelers have to drive up to North River Road, left onto North River Road and make a U-turn on Redondo Drive and head back toward College Boulevard to enter the parking lot. A U-turn is not allowed on College Boulevard and North River Road. Currently there are no restroom facilities, but with the construction of Mance Buchanon Park adjacent to the parking lot, trail users will have access to the park's facilities. Picnic tables are present at this staging area

and there is good signage from northbound College Boulevard to inform users of the bike path entrance. A new traffic signal is being installed to provide protected access to a new off-street parking lot for bicyclists and new park users.

In April of 2008, Phase 1 of the San Luis Rey River Trail extension was completed east towards Andrew Jackson Street and Tyler Street. Currently there is no access onto the San Luis Rey River Trail from Andrew Jackson Street. Phase 2 will begin at Andrew Jackson Street, around the corner to the Tyler Street outlot and then to North Santa Fe Road. This entire length will be a Class 1 bike path.

2.12 Access to transit sites and inter-modal transfer points

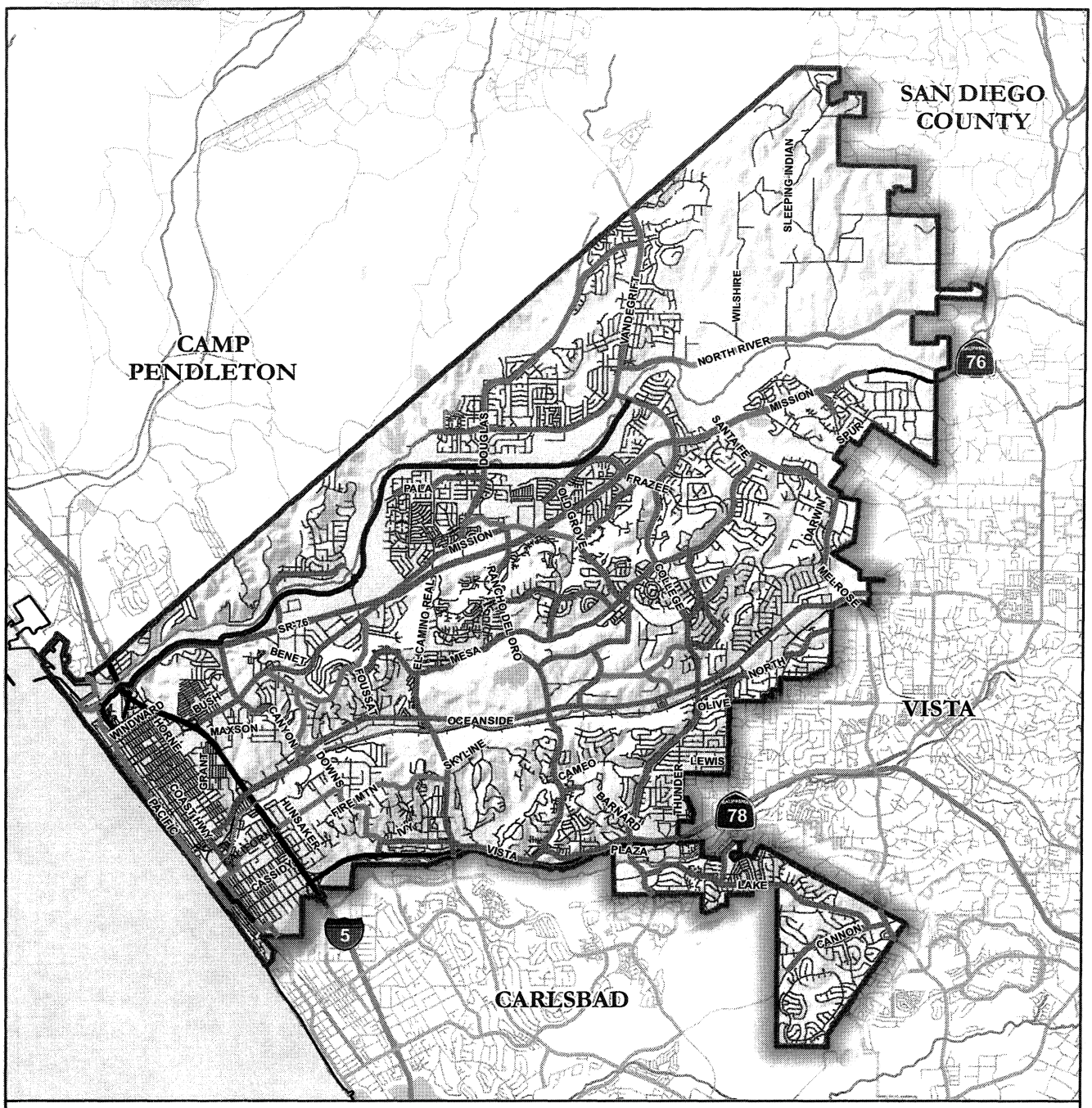
The Oceanside Amtrak Station is primarily accessed from South Tremont Street and Michigan Ave on the east side of the railroad tracks. Access from the west side of the tracks is from the Myers Street parking lot. An ADA accessible underground crossing at the end of Tyson Street and Myers Street allows users to safely access the transit station on the east side of the tracks. Skateboarders and bicyclists must walk their skateboards and bikes on the ramps. Bicycle amenities include bike lockers and "bike lids."

Oceanside Transit Center

The new Sprinter which runs from Oceanside to Escondido, will have seven stations along the east-west corridor of the Sprinter route. Sprinter locations are located at:

Oceanside Transit Center, Michigan and Tremont Streets
Coast Highway Station, Tremont and Godfrey Streets
Crouch Street Station, Oceanside Blvd and Crouch Street
El Camino Real Station, S. El Camino Real and Industry Street
Rancho Del Oro Station, Oceanside Boulevard and Rancho Del Oro Road
College Boulevard Station, Behind Armstrong Garden Center on College Boulevard and Oceanside Boulevard
Melrose Station, Oceanside Boulevard and Melrose Drive

Currently, Class 2 bike lanes are the primary bicycle facility that accesses these stations. A Class 3 bike route on Crouch Street accesses the Crouch Street Station. No existing bicycle facility accesses the Oceanside Transit Center.



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

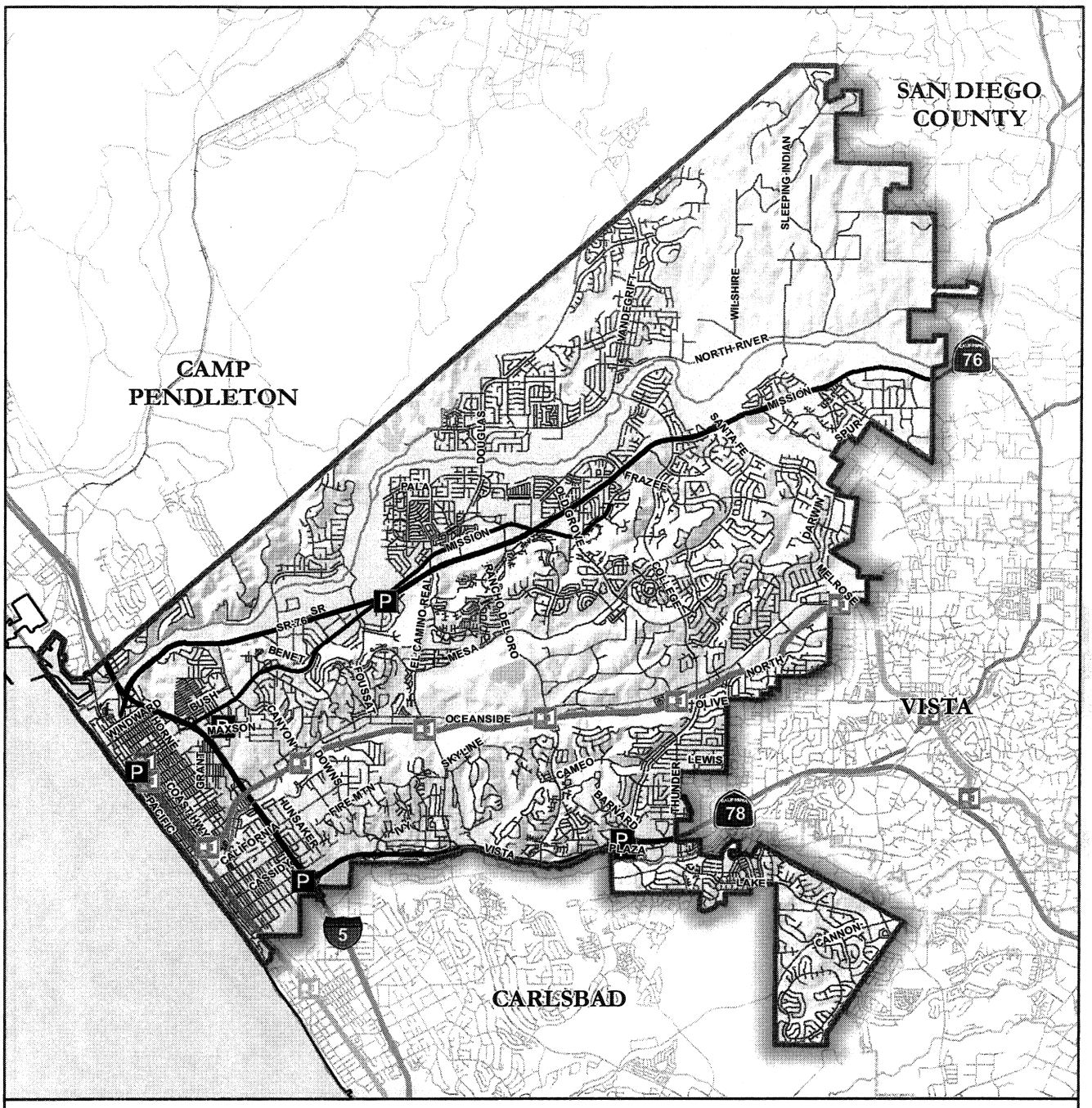
Existing Bicycle Facilities

Class 1: Bike Path
Class 2: Bike Lane
Class 3: Bike Route

Figure 2.15 Existing Bicycle Facilities

0 0.5 1
Miles

Data Source: SANDAG and KTU+A (2008)



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers
Park and Rides
Sprinter Station
Coaster Station
Sprinter Alignment
Coaster Alignment

Figure 2.16 Coaster and Sprinter Alignments

0 0.5 1
Miles

Data Source: NCTD

2.13 Gaps in existing regional bikeway facilities

- There are a few bike lanes that do not continue to the upcoming intersection due to roadway narrowing as it approaches the intersection. Melrose Drive at Santa Fe Avenue is an example of an incomplete bike lane in the system.

- The San Luis Rey River Trail currently ends at College Boulevard, but plans are in place to extend the trail southeast through Guajome Park and eventually connect with the Oceanside-Escondido Rail Trail.

- Bike lanes are non-existent on El Camino Real between Mission Avenue and Mesa Drive. This stretch of road continues as bike lanes north past Mission Avenue and south past Mesa Drive. Due to the topography and lack of shoulder width, bike lanes have been excluded on this section of El Camino Real, although it is programmed to have bike lanes.

- Bike lanes on westbound Mission Avenue do not continue west of I-5.

- There are no bike lanes on Mission Avenue/SR-76 between Saddleridge Road and the City limit.

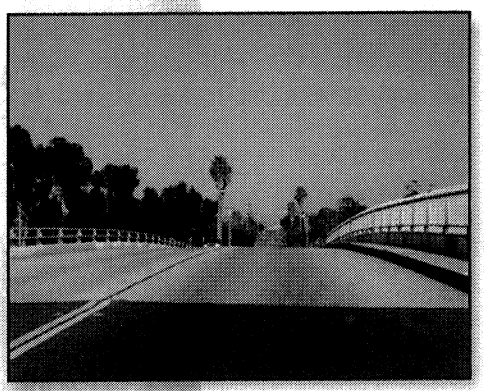
- There are no east-west bicycle facilities connecting I-5 and the coast between Oceanside Boulevard and the San Luis Rey River Trail

2.14 Existing bikeway hazards

2.14.1 Highway Crossing Hazards

Cassidy Street and I-5

The Cassidy Street bridge has adequate lane width with on- and off-ramps to southbound I-5 only. There is a sidewalk on south side with high fencing, but only low railing and no sidewalk on north side. There currently are no existing bicycle facilities, but this is programmed to be a Class 3 bike route. The bridge connects single family residential neighborhoods.



Cassidy Street at I-5

College Boulevard and SR-78

Bike lanes continue through this intersection as College Boulevard travels underneath SR-78. This is a very congested intersection with four lanes in each direction on College Boulevard with on- and off-ramps to SR-78. Signage through the underpass is confusing and is too close to the intersection which does not give sufficient time for bicyclists to decide on which lane to take.

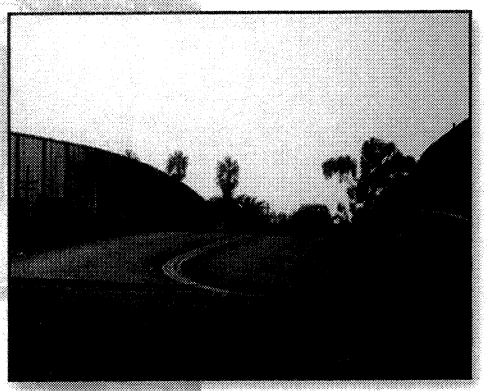
Mission Avenue and I-5

Mission Avenue crosses over I-5 and does have a striped shoulder that is not a bike lane. Bike lanes begin just east of bridge past the northbound off-ramp from I-5.

2.14.2 Highway Crossing Opportunities

Civic Center Drive/Bush Street Bridge and I-5

This overpass has low traffic volumes and adequately wide lanes with sidewalks on both sides with no existing bicycle facilities. The overpass has tall railings and fencing and no freeway on- or off-ramps. It primarily connects two neighborhoods.



Brooks St/Division Street Bridge at I-5

Division and Brooks Streets and I-5

This freeway crossing connects to neighborhoods and has low traffic volumes, tall railings and fencing, and adequately wide lanes with a sidewalk on the north side. Currently there are no existing bicycle facilities but is programmed to be a Class 3 bike route. The lack freeway

on- or off-ramps makes this a good crossing opportunity particularly because it connects adjacent neighborhoods to the Boys and Girls Club, Senior Citizen Center, Center City Golf Course and the Ron Ortega Recreation Park.

California Street and I-5
This bridge has a northbound off-ramp onto I-5 only and connects neighborhoods on opposite sides of the highway. There is a sidewalk on the south side/eastbound only and a fog line with a narrow shoulder on the north side/westbound lane. The bridge has tall fencing on both sides. This bridge has low traffic volumes since it primarily connects single family residential neighborhoods.

2.15 Bicycle facility configurations at intersections

The most prominent bicycle facility hazard in the City is at intersections where bike lanes are to the right of right-turn-only lanes.

Douglas Blvd at North River Road

Examples of intersections with this current configuration are:
Douglas Road at North River Road
Lake Boulevard at Thunder Road
College Boulevard at Waring Road
Oceanside Boulevard at El Camino Real
Foussat Road and SR-76
North River Road at College Boulevard
Old Grove Road at College Boulevard
Vista Way at El Camino Real

CALTRANs Chapter 1000 Figure 1003.2C illustrates bike lanes going through the intersection should be on the left side of the right-turn only lane. Bicyclists would travel across the right-turn-only lane to enter the bike lane that allows them to travel through the intersection. Consistency is important and approximately one mile from the Lake Boulevard and Thunder Road intersection is a correct configuration at Lake Boulevard and Cannon Road. Lane width and adequate space are constraints that need to be assessed when re-striping for bike lanes.

2.16 Maintenance of bikeway facilities

Current maintenance of the bicycle facilities includes street sweeping of major arterials weekly and bike paths are swept once a month. The city provides a phone number to the Public Works Department to notify of hazards or repairs needed along City streets. The phone number is (760) 435-4500.

3 Survey of Existing Bike Maps, Trails and Regional Plans

The following are verbatim excerpts from the referenced documents as they relate to the City of Oceanside's bikeway planning efforts. Additional explanatory notes are italicized.

3.1 Carlsbad Bikeway Master Plan (2001)

The Carlsbad Bikeway Master Plan is intended to guide bicycle facility planning for the City of Carlsbad. The process included evaluating existing roadways and bicycle facilities using conventional field techniques, computerized geographic information systems, survey questionnaires and a bicycling suitability formula. The plan recommends revisions to existing facilities, construction of new facilities and an implementation program. The plan also includes general design and engineering guidelines for the development of these facilities.

3.1.3 Implementing Policies and Action Programs

Establish four categories of scenic corridors and designate streets to be included within those categories as follows:

Community Theme Corridors - connect Carlsbad with adjacent municipalities and present the City of Carlsbad to persons entering and passing through the community. Community Theme Corridors include:

- El Camino Real
- Carlsbad Boulevard
- Palomar Airport Road
- La Costa Avenue
- Melrose Drive

Community Scenic Corridors - interconnect major sub¬areas of the present and planned Carlsbad community. Community Scenic Corridors include

- College Boulevard
- Cannon Road
- Carlsbad Village Drive
- Faraday Avenue
- Interstate 5
- La Costa Avenue
- Olivenhain Road/Rancho Santa Fe Road
- Poinsettia Lane/Carrillo Way

Natural Open Space and Recreation Corridors - offer spectacular views of waterscapes, land forms, wildlife, and the Pacific Ocean. Natural Open Space and Recreation Corridors include:

- Adams Street/Park Drive
- Batiquitos Drive
- Jefferson Street (portion adjacent to Buena Vista Lagoon)

Railroad Corridor - presents the City of Carlsbad to people passing through the City by rail. The only Rail Corridor is:

- San Diego Northern Railway

Include roadways as scenic routes which provide significant views of the ocean, lagoons, open space lands, back country and urban activity.

3.4.1 Trails and Community Parks

One of the objectives of the trail system was to connect to the various existing and proposed community parks located throughout the City. The system developed in this plan connects

all the following sites:
- Hosp Grove Park
- Larwin Park*
- Calavera Park
- Veterans Memorial Park*
- Poinsettia Park
- Alga Norte Park*
- Carrillo Ranch
- Stagecoach Park

**Planned - not yet existing*

In addition, Hosp Grove and the area around Lake Calavera (south of Lake Blvd in Oceanside) are under consideration as Special Resource Areas. In both cases, the intent of a trails-oriented Special Resource designation would be to provide an unimproved natural area for hiking and bike use.

3.5.1 Oceanside

With the exception of the north-south linkage along the coastal railroad corridor, there is only one strong trail linkage opportunity between the City of Carlsbad and the City of Oceanside. The physical barriers presented by Route 78 and Buena Vista Lagoon effectively preclude any other possibilities. The one linkage identified by the Open Space Plan, other than the regional link along the railroad right-of-way, connects Lake Calavera with a recently constructed neighborhood park in Oceanside immediately south of Lake Boulevard, just beyond the northeast corner of the City of Carlsbad. Additional linkages between the two cities have tentatively been identified within the rights-of-ways along Coast Highway, Jefferson Street, El Camino Real, Rancho del Oro and within the future alignment of College Boulevard. These will be comprised of bicycle lanes and sidewalks and, as such, would not constitute the type of trail system being considered within the Open Space Plan. It is recommended that the City of Carlsbad ensure that any future planning for bicycle circulation take into account linkages to Oceanside.

3.5.2 Vista

Exhibit "E" of the Bicycle, Hiking and Equestrian Trails Element of the Vista General Plan indicates a number of trail links running north and east from Lake Calavera into Vista. All these alignments (which are shown very conceptually) run through already developed areas of the City of Oceanside. Vista is also conceptually considering a trail linkage westward from Buena Vista Park into the City of Oceanside. In this case, field investigation and assessment of ownership revealed the only physically feasible link would have to run across the top of a steep slope held under seven different ownerships from whom access rights would have to be acquired or dedication made by the property owners. Given that the trail would provide visual access into the homes concerned, this whole linkage seemed very unlikely to succeed. Moreover, with access to Squires Dam limited, and the views of the reservoir from afar being cluttered with large industrial structures, it was not felt that this linkage was worth pursuing. The City of Vista also indicates on Exhibit "E" a link along Melrose Drive.

3.2 City of Carlsbad: Current Conditions

Currently there are approximately 27 miles of unpaved recreational trails located in a variety of open space areas of the City with future plans calling for another 34 miles to be built in the future. In addition to the unpaved multi-use recreational trails, there are currently approximately 48 miles of bike lanes associated with the City's Roadways.

According to the Carlsbad Citywide Trails Map, Future Unpaved Open Space Trail will make connections with the southeast sector of the City of Oceanside between Lake Boulevard and Cannon Road. College Boulevard and El Camino Real connect to the City of Oceanside with Class 2 bike lanes. The existing Coastal Rail Trail is the westernmost connection as it crosses Buena Vista Lagoon.

3.3 City of Vista's Non-motorized Transportation Facilities Master Plan (2002)

This Master Plan serves as a policy document to guide the development and maintenance of a bicycle network, support facilities and other programs for Vista over the next 20 years. These policies address important issues related to the City's bikeways, such as planning, community involvement, utilization of existing resources, facility design, multi-modal integration, safety and education, support facilities as well as specific programs, implementation, maintenance and funding.

Proposed bikeway projects are selected and ranked by priority using several criteria. These include:

- Regional connectivity
- Closing gaps in the bikeway network
- Connections with major destinations, such as National University, employment centers, major shopping centers, and transit centers
- Completion of the bikeway network
- Availability of street width or right-of-way
- Existing plans the City has to improve and/or widen streets

First Priority Projects*

Street: Oceanside-Escondido Rail Trail
From: Oceanside City limit to eastern Vista city limit
Proposed Class: Class 1 Bike Path
Mileage: 5
Cost: $2,500,000

Second Priority Projects*

Street: North Santa Fe Avenue
From: Oceanside city limit to Bobier Drive
Proposed Class: Class 2 Bike Lanes
Mileage: 1.5
Cost: $75,000

Street: Emerald Drive
From: West Vista Way to Olive Avenue
Proposed Class: Class 2 Bike Lanes
Mileage: 1
Cost: $50,000

Street: Hacienda Drive
From: Oceanside city limit to Vista Village Drive
Proposed Class: Class 3 Bike Route
Mileage: 2
Cost: $20,000

Third Priority Projects*

Street: Shadow Ridge Drive
From: Oceanside city limit to Melrose Drive
Proposed Class: Class 3 Bike Route
Mileage: 1.25
Cost: $12,500

** Projects with connections to the City of Oceanside*

3.4 San Diego County Bicycle Master Plan (2003)

This Bicycle Transportation Plan serves as a policy document to guide the development and maintenance of a bicycle network, support facilities and other programs for the unincorporated portions of San Diego County. These policies address important issues related to the County's bikeways such as planning, community involvement, utilization of existing resources, facility design, multi-modal integration, safety education, support facilities, as well as specific programs, implementation, maintenance, and funding.

Unincorporated areas that have a connection with the City of Oceanside are Bonsall, Fallbrook, Pendleton-Del Luz and North County Metro.

Bonsall

First Priority Projects*

Street: SR-75
From: Oceanside city limit to Fallbrook community boundary
Proposed Class: Class 2 Bike Lanes
Mileage: 3.95

Second Priority Projects*

Street: San Luis Rey River
From: Oceanside city limit to Fallbrook community boundary
Proposed Class: Class 1 Bike Path

Street: North River Road
From: Oceanside city limit to SR-75
Proposed Class: Class 2 Bike Lanes

Street: Via Puerta Del Sol
From: Olive Hill Road to North River Road
Proposed Class: Class 3 Bike Route

** Projects with connections to the City of Oceanside*

There are no proposed connections from the unincorporated areas of Fallbrook, North County Metro and Pendleton-De Luz to the City of Oceanside.

3.5 SANDAG Mobility 2030: A Transportation Plan for the San Diego Region (2003)

Accommodating Bicycling and Walking

People traveling on foot or by bicycle have the same needs as motorists. They want safe and convenient ways to travel, and they need access to most all of the same destinations as motorists. To meet this need, the region's transportation system should be designed and built to accommodate bicyclists and pedestrians. This notion has been established by both federal and state policy. The 1999 federal guidance regarding the bicycle and pedestrian provisions in the Transportation Act for the 21st Century makes clear that accommodating bicycle and pedestrian travel should be a routine part of the planning, designing, construction, and operation of every federally funded transportation project. Likewise, Deputy Directive 64 commits Caltrans to "fully consider the needs of nonmotorized travelers in every aspect of its work." Local and regional agencies need to take the same approach when developing transportation improvements.

Most bicycle and walking trips are relatively short and within a single community. While these community trips may be focused on a neighborhood commercial district, school, or other community service like public transit, the trip origins are widely dispersed. Because of this, the transportation network must accommodate bicycle and pedestrian travel. Transportation

facilities should be designed to encourage bicycle and walking trips, and not be a barrier to those trips. Whether a freeway interchange, local arterial or residential street, the needs of bicyclists and pedestrians should be included in the program from the start and thus, the cost of providing that access can be minimized, especially when compared to the cost of retrofitting an existing facility.

Making Bicycle and Pedestrian Friendly Communities

The region's transportation system needs to provide a full range of transportation choices in a balanced and integrated manner. Sidewalks and streets do not accomplish this alone. A complementary relationship must exist between the transportation system and land uses that it serves.

Access to Public Transit

The principles in Planning and Designing for Pedestrians support the region's goals for improving access to public transit. Mixed land use and network connectivity make it easier for public transit to efficiently take people where they want to go. Well-designed sidewalks and crosswalks make walking to and from transit more attractive. The guidelines show how to do this, and how to incorporate transit stops into pedestrian walkways so there will be room for both.

Bicycle Facilities and Access

Communities that support walking as a means of access usually are bicycle-friendly communities as well. The mix of land uses bring more destinations into easy bicycling range where the bicycle can fill the gap between destinations that can be reached on foot and those that would require a transit or auto trip. Calming traffic on pedestrian-oriented streets usually makes them more attractive places to ride a bike.

Beyond these improvements, bicycle access is improved where the road network provides space for bicyclists and road surfaces are well maintained. Where the street network cannot adequately serve bicyclists, separate bike paths should be built. These bike paths or trails also can provide access for pedestrians. Also important are adequate bike parking and other support facilities and ongoing education and promotional programs.

Bike Parking

Bicycle theft is one of the deterrents to bicycle travel, but it can be overcome by providing quality bicycle parking facilities. Fortunately, good bicycling parking can be provided at a very modest cost. In contrast, poor quality bike parking is often underutilized because it is either inconvenient, does not effectively secure the bike, or both. Through its Bicycle-Pedestrian Advisory Committee, SANDAG has developed bicycle parking guidelines that should be disseminated and adopted around the region. For bicycle commuting trips, employers should be encouraged to provide bike lockers or other high security parking.

On-Demand Bike Lockers

On-demand bicycle lockers allow bicycle commuters to use any locker at a given site on a first-come, first-serve basis. Such lockers are being pilot tested for consideration for new and replacement installations of the region's existing bicycle lockers. These state-of-the-art lockers use electronic keys, allow multiple users the opportunity to use the same locker, and have the ability to provide information about utilization and demand. The potential benefits of the on-demand lockers include reduced program administration costs, reduced inappropriate usage of the lockers, and increased utilization. In addition, the total number of lockers required at any given site may be reduced as the number of lockers required only needs to meet the peak demand. Currently a locker is provided for every registered user, regardless of how often that person uses it. Upon successful completion of the pilot program, the entire system could be converted as old lockers reach the end of their useful life.

Support Facilities

Support facilities such as clothing lockers and showers greatly enhance the experience of bicycling to and from the workplace and also serve to encourage employees to consider bicycling as a viable commute choice. Where employment density warrants, local agencies should consider policies that encourage building owners and employers to provide clothing lockers and showers for their employees to accommodate longer bike trips.

Bicycle Education

The most frequently cited reason for not riding a bicycle is concern for personal safety. This is understandable since bicyclists are very vulnerable in collisions with motor vehicles. However, education on proper bicycle riding can significantly improve the bicyclist's safety, which in turn can help to overcome some of this resistance. Since there is no region-wide bicycle safety education program, efforts should be made to make bicycle safety information available to both adults and children. Bicycle education for children should be provided through the schools. Instituting an ongoing program in the schools will likely require development of a teacher training program. Effective programs that can serve as a model have been instituted in Texas and Nevada. Opportunities also may exist to distribute bicycle safety materials to adults in conjunction with campaigns that promote alternatives to driving alone, but a program will have to be developed and funding sources will have to be identified for such an effort. To further encourage both bicycling and walking, the Plan also recommends continued support for RideLink's annual Bike to Work Day and support for events like the annual Walk Your Child to School Day.

Bicycle and Pedestrian Program Funding

Financing bicycle and pedestrian projects, and providing incentives for community designs that support these modes, is one of the challenges facing the region. Often, no separate funding for these improvements is required when bicycle and pedestrian infrastructure improvements are included as part of a larger transportation project.

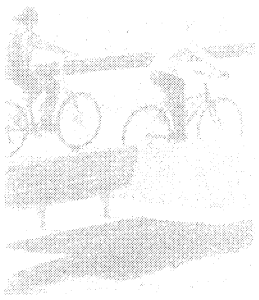
However, there are many communities in the region that would benefit from improved bicycle and pedestrian facilities that do not anticipate new construction or major redevelopment. Financing improvements in these areas is often difficult. The annual revenues from the Transportation Development Act for bicycle and pedestrian projects (currently about $2.5 million), and the $1 million in annual TransNet funds set aside for bicycle projects, provide less than half the funds requested in each annual funding cycle.

No accurate estimates exist for needed pedestrian infrastructure improvements, but based on existing bicycle transportation plans and additional estimates provided by local jurisdictions, current bicycle project needs for the region are at least $200 million. Additional funding will be required to support a significant near term effort to implement the nonmotorized component of the Plan.

MOBILITY 2030 fills some of this funding gap by doubling annual bike and pedestrian funding levels.

3.6 San Diego Region Bike Map (2007) - SANDAG

The San Diego Region Bike Map connects North Harbor Drive to Interstate 5 just north of the City limits. According to SANDAG, the north and southbound lanes have freeway shoulder bike access. Some freeway shoulders are open to bicyclists. Use of freeway shoulders by inexperienced bicyclist is not recommended. Obey all regulatory signs and exit the freeway when required.



Another connection from North Harbor Drive is to Vandergrift Boulevard/Stuart Mesa Road which travels into Camp Pendleton. This stretch of road is a Reduced Speed or Restricted Access Path. This path is where access is restricted or where speed limits are posted due to congestion or other safety considerations.

3.7 NCTD Short Range Transportation Plan

Bicycle Facilities

In addition to promoting the use of mass transit, NCTD often promotes the use of alternative transportation modes, such as bicycling. Bicycle racks are provided on the front of each fixed route vehicle and designated bicycle storage space is provided on the Coaster. In addition, storage racks and bicycle lockers are provided at most of the transit centers and Coaster stations.

Although the District provides a large number of bicycle storage facilities, some of the racks and lockers have deteriorated and are in need of replacement. In addition, the demand for bicycle lockers exceeds the supply at a number of stations.

In order to continue to promote bicycling in North County, the District has developed a program aimed at increasing and upgrading the bicycle facilities on the buses and at each of our transit centers. The Bicycle Facility Improvement Program was has been presented to the Board of Directors as well as SANDAG's Bicycle and Pedestrian Advisory Committee (BPAC). Both groups felt that the program would positively impact the transit system and encouraged planners to continue with the improvements.

Currently the Sprinter cars have designated areas for bicycles. At each Sprinter Station, bike lockers are available.

3.8 City of Oceanside General Plan: Recreational Trails Element (2002)

The 2002 Recreation Trails Element (RTE) describes some of the issues relating to the existing bicycle and trail system including; the extensive system of planned bikeways within the City, but only a fragmented system of constructed trails, the extreme danger of the City's transition to Camp Pendleton and destination support, i.e. bicycle racks, showers, rest areas and drinking fountains are rare on routes and at destinations.

Mission Statement

To provide a safe and efficient system of bicycle, equestrian, and pedestrian trails throughout the City, creating a non-motorized connection to recreational and commuting destinations.

GOAL:

1. Encourage safe multiple use trails within the City that provide a variety of experiences.

OBJECTIVES:

The City should:

1.1 Encourage the development of Class I (off-street) trails for multiple use.

1.2 Encourage incorporation of pedestrian use within the north-south rail-trail during the planning and design process.

1.3 Where feasible, design trails to the maximum width to safely accommodate multiple trail users.

1.4 Design the trail on the north side of the San Luis Rey River to accommodate pedestrian uses, including running events and other organized activities.

1.5 Organize a volunteer advisory committee of users to periodically review implementation of this plan and adjust priorities of capital expenditures.

1.6 Design trails which are aesthetically pleasing, incorporating landscaping, buffering, scenic overlooks, and historic elements where possible to provide a variety of experiences.

Bicycle System

ISSUES:

• The City has an extensive system of planned bikeways within the City, but only a fragmented system of constructed trails.

• The transition to Camp Pendleton is currently extremely dangerous.

• The City has three major regional corridors that encourage Class I use: San Luis Rey River. and two rail corridors (east-west and north-south).

• Destination support, i.e. bicycle racks, showers, rest areas and drinking fountains, are rare on routes and at destinations.

GOAL:

2. A safe, interconnected network of bicycle facilities within Oceanside.

OBJECTIVES:

The City should:

2.1 Implement the Bicycle Circulation Master Plan.

2.2 Coordinate with Caltrans in developing a Class II bike lane along the length of Highway 76.

2.3 Coordinate with the U.S. Army Corps of Engineers in developing a paved Class I trail on the southern San Luis Rey River levee.

2.4 Prioritize pavement maintenance on Class II bike lanes to promote safe usage.

2.5 Design Class II bikeways (bike lanes) on all prime major and secondary arterials and collector streets that function as links for the bicycle network. In such cases. The City should reduce hazards to cyclists on collector streets by eliminating on-street parking.

2.6 Follow Caltrans Highway Design Manual Section 7-1000 for Class I/II bikeways.

2.7 Prioritize the development of the three major Class I trails: the San Luis Rey River, north-south rail-trail, and east-west rail-trail.

2.8 Encourage existing and future bicycle destinations (parks, schools, commercial and employment centers, etc.) to incorporate bicycle facilities and provide safe and convenient bicycle access. To this end, development should provide secured bicycle parking and storage facilities such as bicycle racks, pedestal posts, rental bicycle lockers, and shower and locker facilities per City standards.

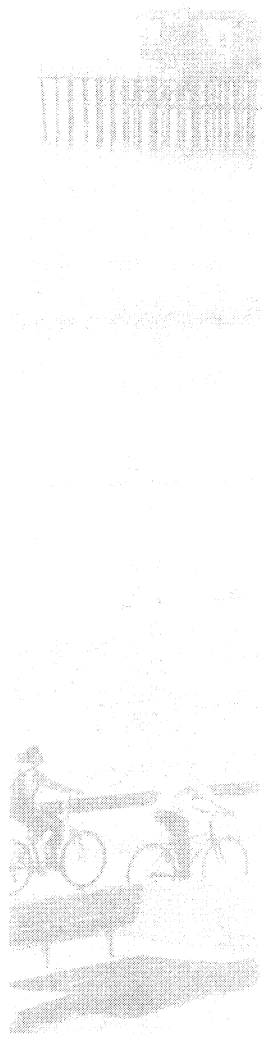
2.9 Provide bicycle parking at all major bus, rail and park-and-ride facilities.

2.10 Continue to pursue and monitor private, local and federal funding sources for bikeway and other trail improvements.

2.11 Develop a Bicycle Facilities Master Plan to identify and plan for bicycle support facilities (lockers, showers, etc.) throughout the City.

GOAL:

3. A safe transition from Oceanside to the Camp Pendleton bike trail.



OBJECTIVES:
The City should:
3.1 Petition Caltrans to allow cyclists to use the 76 bypass-San Luis Rey River bridge on I-5 to access Camp Pendleton from the east and south.

3.2 Pursue the potential for a connection to Camp Pendleton via the planned north-south rail-trail corridor, utilizing the free public parking lot in the harbor as a staging area.

3.3 Investigate connection to Camp Pendleton through the residential streets north of the San Luis Rey River.

3.4 Fund a design study of the 1-5 transition to Camp Pendleton to investigate long term improvements and prioritize the implementation of recommended improvements.

GOAL:
4. Safe bicycle use within the City for recreational and commuter users.

OBJECTIVES:
The City should:
4.1 Calibrate traffic signal control loops to sense bicycle riders and/or provide curbside push button controls.

4.2 Sponsor community-wide safety and education programs to encourage citywide bicycle use.

4.3 Implement a comprehensive signage program for all classifications of bikeways.

4.4 Prioritize the lane striping of Class II bike lanes.

Please refer to the City of Oceanside Recreational Trails Element for further details on these topics.

3.9 City of Oceanside General Plan: Circulation Element (2002)

The 2002 Circulation Element does not clearly state any recommended facilities needed to complete the bicycle system. Instead, there is a list of general objectives to apply to bicycle facility needs and a Bicycle Circulation Master Plan Map. In comparison with existing facilities, the following are the planned facilities that have yet to be completed:

Class 1
- Oceanside-Escondido Rail Trail
- Connection between San Luis Rey River Trail to the Oceanside-Escondido Rail Trail through Guajome Park.
- Coastal Rail Trail

Class 2
- Foussat Road between Benet Road and Mission Avenue
- El Camino Real between Douglas Boulevard and Mesa Drive
- Fireside Street between Los Arbolitos Boulevard and Mission Avenue
- Los Arbolitos Boulevard between Pala Road and Fireside Street
- Emerald Drive between Lake Boulevard and City limit
- Cannon Road between Mystra Drive and City limit
- SR-76 between Saddleridge Road and City limit
- North River Road between Stallion Drive and City limit
- Mission Avenue between Rancho Del Oro Drive and Old Grove Road

Class 3
- Brooks Street between Mission Avenue and I-5
- Division Street between I-5 and Grant Street
- Grant Street between Division Street and Wisconsin Avenue
- Wisconsin Avenue between Grant Street and Pacific Street
- Hunsaker Street between California Street and Cassidy Street
- Cassidy Street between Hunsaker Street and Broadway
- Sleeping Indian Road between North River Road and City limit
- Sky Haven Lane between Lake Boulevard and Azure Lado Drive

Current and proposed bicycle plans, inventories and policies

The 2002 City of Oceanside Circulation Element states that the objective of the bicycle facilities is to "Provide an integrated bicycle circulation system which includes facilities to promote the environmental and social benefits of commuter and recreational bicycling. The bicycle circulation system and associated bicycle facilities shall provide mobility and safety to all persons and areas within the City of Oceanside." The current policies are:

A. Class II Bikeways (on-street bike lanes) shall be planned into all primary, major, and secondary arterials.

B. Collector streets, which are identified to function as links for the bicycle circulation system, should be provided with Class II Bikeways (bike lanes). In such cases, the City shall accommodate cyclists on these identified streets by widening the street or eliminating on-street parking wherever possible.

C. The City shall cooperate with other governmental agencies to provide connection and continuation of the Pacific Coastal Bicycle Corridor and the San Diego-Anza Borrego Bicycle Corridor as identified in the Regional Transportation Plan of San Diego County.

D. The utilization of land shall integrate the bicycle circulation system with auto, pedestrian, and transit systems.

E. Development shall provide short-term bicycle parking and long-term bicycle storage facilities, such as bicycle racks, pedestal posts, and rental bicycle lockers. Provision of bicycle storage facilities shall apply to medium- and high-density residential developments as well as to commercial and industrial developments.

F. Development shall provide safe and convenient bicycle access to high activity land uses, such as schools, parks, and shopping, employment, and entertainment centers.

G. The City shall continue seeking funds at the private, local, State, and federal levels for bicycle circulation system expansion.

H. Development of the Bicycle Circulation System shall be consistent with the implementation of the City's Recreational Trails Element.

3.10 San Luis Rey River Trail: Opportunities and Constraints (2005)

The January of 1996, the City of Oceanside adopted a Recreational Trails Element. This document is a sub-element of the Circulation Element of the City's General Plan and provides the vision and the guidance for subsequent trail planning efforts. The Recreational Trails Element calls for the constructed trails to create linkages along several logical corridors, including the San Luis Rey River and railroad rights-of-way.

Through City efforts and opportunities provided by the Army Corps of Engineers, the San Luis Rey River Trail now stretches 7.2 miles from Oceanside Harbor to College Boulevard. This document examines the feasibility of connecting the existing trail terminus at College Boulevard east 2.8 miles to Melrose Drive via North Santa Fe Drive. The proposed Class I alignment is broken down to two segments:

1. College Boulevard to North Santa Fe Drive Reach
2. North Santa Fe to Melrose Drive Reach ultimately connecting into the future Hi Hope Ranch Development.

The College Boulevard to North Santa Fe segment is roughly 1.6 miles. The North Santa Fe to Melrose Drive (Hi Hope Ranch) portion is approximately 1.4 miles with a parallel equestrian trail connecting to Guajome Regional Park via an existing undercrossing of Mission Ave (SR 76).

Currently a half mile section just east of College Boulevard has been repaved as part of the connection to North Santa Fe Road. This section currently extends to Andrew Jackson Street and Polk Street. No access to the San Luis Rey River Trail is available at this intersection.

3.11 Survey of Planned Local Bikeways

The following lists the programmed bicycle facilities yet to be completed according to a survey of existing facilities and the 1995 Circulation Element of the General Plan.

3.11.1 Class 1 Bike Paths

Class 1 Bike Paths

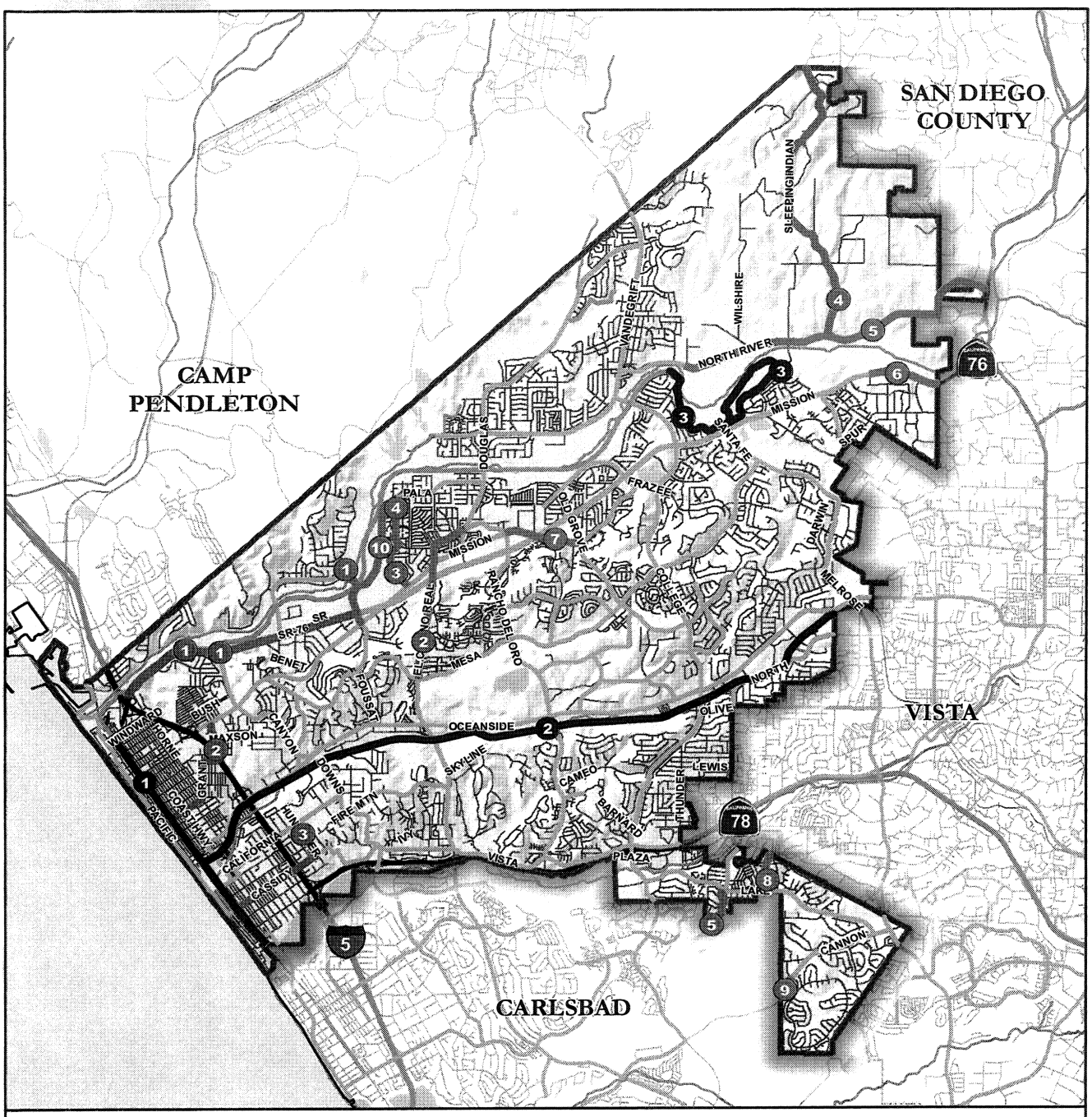
Segment Numbers	Length (ft)	Length (Miles)	Description	Notes	Destinations
1	13,966	2.6	Coastal Rail Trail	Portions have been completed between Vista Way and Morse Street. Not enough room along the track north of the transit center to complete the trail system.	San Luis Rey River Trail, City of Carlsbad, Commercial, Residential
2	37,850	7.2	Oceanside-Escondido Inland Rail Trail	The trail terminates at College Boulevard from Vista and users have to use Oceanside Boulevard to access the beach or downtown Oceanside. Wetland and easement space issues along the rail line still need to be resolved.	Beaches, City of Vista, Commercial, Residential
3	5,828	1.1	San Luis Rey River Trail Extension	Extension from College Boulevard to North Santa Fe Road. A half-mile section has already been constructed from College Boulevard along Andrew Jackson Street and Polk Street	San Luis Rey River Trail, Guajome Park, Residential
4	3,332	0.63	Hi Hope Ranch Bike and Equestrian Tr	Proposed Melrose Drive connection, planned San Luir River Rey connection	Currently conditioned in the development plans
Totals	**60,976**	**11.5**			

3.11.2 Class 2 Bike Lanes

Class 2 Bike Lanes					
Segment Numbers	Length (ft)	Length (Miles)	Description	Notes	Destinations
1	3,248	0.6	Foussat Road between Benet Road and Mission Avenue	To complete the Class 2 connection between Benet Road and Mission Avenue	San Luis Rey River Trail, SR-76, Pacific View Charter School, Residential
2	9,191	1.7	El Camino Real between Douglas Blvd and Mesa Drive	Bike lanes exist on the northbound lanes between Mesa Drive and Mission Avenue. Southbound bike lanes need to be installed. Bike lanes programmed to continue to Douglas Boulevard from Mission Avenue	Heritage Park, Commercial, Residential
3	2,777	0.5	Fireside Street between Los Arbolitos Boulevard and Mission Avenue	Complete connection between Los Arbolitos Boulevard and Mission Avenue	Residential
4	2,479	0.5	Los Arbolitos Boulevard between Pala Road and Fireside Street	Complete connection between Pala Road and Fireside Street	Residential
5	17,876	3.4	North River road between Stallion Drive and east City limit	Currently an existing Class 3 bike route with high speed traffic	Melba Bishop Recreation Center, Bonsall, SR-76, Agriculture
6	3,700	0.7	Mission Avenue between Melrose Drive and the eastern City limit	Complete the connection to the City limit	Bonsall, SR-76, Residential
7	3,939	0.7	Mission Avenue between Rancho Del Oro Drive and Old Grove Road	Currently an existing Class 3 bike route	Heritage Park, Old Mission Montessori, Commercial, Residential
8	2,115	0.4	Emerald Drive between Lake Boulevard and City limit	Complete Oceanside's portion of Emerald Drive of Class 2 bike lanes with the programmed bike lanes of the City of Vista	City of Vista, Residential
9	1,294	0.2	Cannon Road between Mystra Drive and City limit	Complete the connection to the City limit	City of Carlsbad, Residential
10	5,439	1.0	Pala Road between Los Arbolitos and Foussat Road	Completes the connection along the south side of the San Luis Rey River	Residential
Totals	**52,057**	**9.9**			

3.11.3 Class 3 Bike Routes

Class 3 Bike Routes					
Segment Numbers	Length (ft)	Length (Miles)	Description	Notes	Destinations
1	25,861	4.9	SR-76 between Foussat Road and North Coast Highway	Width exists to make this facility Class 2 bike lanes. Coordination with Caltrans is necessary as this section is defined as a highway	Oceanside Municipal Airport, I-5, Commercial
2	7,609	1.4	Brooks Street/Division Street/Grant Street/Wisonsin Avenue between Mission Bouelvard and Pacific Street	Utilizes residential streets and an I-5 crossing without on/off ramps to connect Mission Boulevard to the beach area	Brooks Street Swim Center, Park & Ride, Senior Citizens Center, St Mary Star of the Sea Elementary, Beaches, Coastal Rail Trail, Residential
3	7,095	1.3	Hunsaker Street and Cassidy Street between California Street and Broadway	Utilizes residential streets and an I-5 crossing with only a southbound on/off ramp to connect California Street to the Coastal Rail Trail	Coastal Rail Trail, I-5, Beaches, South Oceanside Elementary, Residential
4	16,566	3.1	Sleeping Indian Road between North River Road and City limit	Connects North River Road to northern City limits	Rural Residential, Fallbrook, Agriculture
5	1,968	0.4	Sky Haven Lane between Lake Boulevard and Azure Lado Drive	Connection from Lake Boulevard to Calaveras Lake trails	City of Carlsbad, Residential, Calaveras Lake
Totals	**59,099**	**11.2**			



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

Existing Bicycle Facilities
Class 1: Bike Path
Class 2: Bike Lane
Class 3: Bike Route

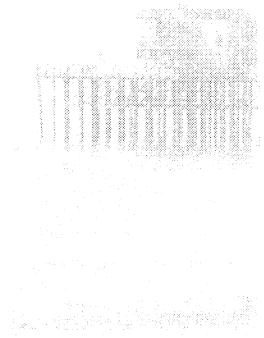
Planned Bicycle Facilities
Class 1: Bike Path
Class 2: Bike Lane
Class 3: Bike Route

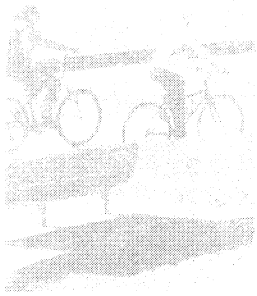
0 0.5 1
Miles

Data Source: City of Oceanside General Plan (1995)

Figure 3.1 Planned Bicycle Facilities

SHARE
THE
ROAD





Recommendations

4.1 Recommended Bikeway Facilities

The existing bikeway system mapping was derived from SANDAG's regional bikeway GIS data and extensive field analysis. The following planned and recommended facilities represent all three types of proposed bikeways.

4.1.1 Class 1 Facilities

Class 1 bikeways (frequently referred to as bike paths) are facilities with exclusive right-of-way for bicycles and pedestrians with cross flows by motor vehicles kept to a minimum. They are physically separated from motor vehicle routes.

Class 1 Bike Path (San Luis Rey River Trail east of College Boulevard)

A wide physical separation is recommended where a Class 1 facility parallels a motor vehicle route. Any separation of less than five feet from the pavement edge of a motor vehicle route requires a physical barrier to prevent cyclists from encroaching onto the roadway. Anywhere there is the potential for motor vehicles to encroach onto a Class 1 bicycle facility, a barrier should be provided. Class 1 routes immediately adjacent to a street are not recommended because many cyclists will find it less convenient to ride on this type of facility as compared to streets, especially for utility trips such as commuting. Other reasons that Class 1 routes immediately adjacent to a street are not recommended is because they can encourage wrong way riding on the street and can create safety problems at intersection crossings.

Unlike on-street facilities that already have defined minimum design speeds, the minimum design speed of Class 1 facilities is a factor to consider. In general, the minimum design speed should be 20 MPH. Speed limits may also be implemented and are generally 15 MPH.

The opportunity exists for the installation of Class 1 facilities that would not only provide the relaxed recreational atmosphere associated with an off-street facility, but could also improve commuter connections. The proposed Class 1 routes would be designed for multipurpose use. The paths should be wide enough (Caltrans requirements call for 8 feet minimum with two feet of clear space on each side) to accommodate multiple user types and should include an unpaved side path (two four 4 feet) for users who prefer a softer trail. Also, adding two feet of additional width to these facilities to make them 10 feet wide helps prevent edge damage from full size maintenance vehicles.

4.1.2 Class 2 Facilities

Class 2 bikeways (often called bike lanes) are one-way facilities placed next to the curb or parking lane for the preferential use of bicycles within the paved area of streets. They are designated by striping, pavement markings and signage. Class 2 facilities must be at least five feet wide where no parking occurs and six feet wide where parking does occur. Class 2 facilities are in place primarily throughout the major arterials. Class 2 lanes may be used where roadway speeds and ADTs are fairly high, but adequate roadway width is available. Directness and number of users are significant factors.

4.1.3 Class 3 Facilities

Class 3 routes are within the vehicular right-of-way, but delineated by directional signage only and in some cases by Shared Lane Markings or "Sharrows" such as on Pacific Street. They are recommended where roadway speeds and ADTs are fairly low, and where route directness and the number of users is not likely to be significant. Class 3 routes are also

used to designate alternate routes to avoid congested areas that may be less stressful, especially for inexperienced cyclists, such as Safe Routes to School.

4.1.4 Recommended Projects in Caltrans Right-of-Way

The following projects have been separated from the Prioritized Projects in Chapter 5 because the facilities described are located in Caltrans rights-of-way. Getting these projects funded and built will take close coordination with Caltrans and further studies may be needed. Although they are technically outside the City's jurisdiction, they are critical in providing a complete bikeway system within the City of Oceanside and therefore are being included in this Master Plan. (See Figure: 4-4: Recommended Projects in Caltrans Rights-of-Way)

Recommended Class 1 Projects on CALTRANs Rights-of-Way

Segment Numbers	Length (ft)	Length (miles)	Descriptions	Destinations	Notes
1	8,233	1.56	North of Mission Avenue from Melrose Drive to city limit	Bonsall, Hi Hope Ranch Development, Jefferies Ranch	Coordinate with Caltrans to see if feasible

Recommended Class 2 Projects on CALTRANs Rights-of-Way

Segment Numbers	Length (ft)	Length (miles)	Descriptions	Destinations	Notes
1	29,646	5.61	SR-76 between Foussat Road and North Coast Highway	Oceanside Municapal Airport, I-5	Bike lane space is available
2	3,700	0.7	Mission Avenue between Melrose Drive and the eastern City limit	Bonsall, SR-76, Residential	Complete the connection to the City limit
Totals	**33,346**	**6.32**			

4.2 Recommended Projects

The following tables are recommended projects based on field observations, analysis, input from the workshops, the Oceanside Bicycle Committee and City staff. They are in no particular order or level of priority.

4.2.1 Class 1 Bike Paths

Recommended Class 1 Bike Paths

Segment Numbers	Length (ft)	Length (miles)	Class 1 Bike Paths	Destinations	Notes
1	17,495	3.31	Mission Avenue to Inland Rail Trail	Guajome Park, Inland Rail Trail, new Vista park	Coordinate alignment with City of Vista and San Diego County Guajome Park. Coordination with NCTD on connection with Inland Rail Trail.
2	2,797	0.53	Spur Avenue to Melrose Drive and North Santa Fe Avenue	Rural residential, Guajome Park	Possible connection with Melrose Drive extension project
3	3,619	0.69	Douglas Drive and Manteca Drive	Residential	Paving exists. Trailheads and signage needed to complete the bike path designation.
4	3,085	0.58	Between Harbor Drive and Capistrano Drive	Residential, Oceanside Harbor	To avoid the I-5 interchange at Camp Pendleton. Bike path users would travel underneath I-5 onto Capistrano Drive wich would take them to San Rafael Drive and onto the base
Totals	**35,229**	**5.1**			

4.2.2 Class 2 Bike Lanes

Recommended Class 2 Bike Lanes

Segment Numbers	Length (ft)	Length (miles)	Class 2 Bike Lanes	Destinations	Notes
1	1,856	0.35	Los Arbolitos between Fireside Street to El Camino Real	Residential	
2	566	0.11	Rancho Del Oro between Sprinter tracks and Oceanside Boulevard	Sprinter Station	To fill in the gap of missing bike lanes
3	712	0.13	Old Grove Road between Ocean Ranch Blvd and Mesa Dr	Industrial	Eastbound bike lane missing. Westbound bike lanes exist.
4	1,527	0.29	Melrose Drive between Old Ranch Road and Spur Avenue	Mission Meadows Elementary	Class 2 bike lanes exist on northbound Melrose but are missing on southbound Melrose from Seattle Slew to Spur Avenue.
5	1,730	0.33	Olive Drive between College Blvd and City of Vista	City of Vista, Olive Elementary	
6	4,933	0.93	Avenida Del Oro between Old Grove Road and Oceanside Boulevard	Industrial	
7	964	0.18	El Camino Real between Vista Way and City of Carlsbad	SR-78, City of Carlsbad	Overpass over SR-78 to complete bike lanes into/from the City of Carlsbad
8	2,981	0.56	Melrose Drive between North River Road and SR-76	Planned Hi Hope Ranch trail system	Can be condition into new development
9	1,368	0.26	North Old Grove Road between Nichols Elementary and Frazee Road	Nichols Elementary School, residential	
10	1,525	0.29	Avenida De La Plata between Mesa Drive and Avenida Empressa	Empressa Elementary School, residential	
11	520	0.10	Frazee Rd	Old Mission Montessori, O'Keefe Field, Tri_City Inline Park, North County Alano Club, San Luis Rey homes	Frazee Rd does not currently extend out to Academy Road
12	847	0.16	Douglas Blvd between Mission Avenue and SR-76	Commercial, Public Storage	Connects the existing Class 2 bike lanes on Mission Avenue and SR-76
13	6,913	1.31	Avenida De La Plata between Corporate Centre Drive and College Boulevard	Industrial, Commercial	
Totals	**26,442**	**5.0**			

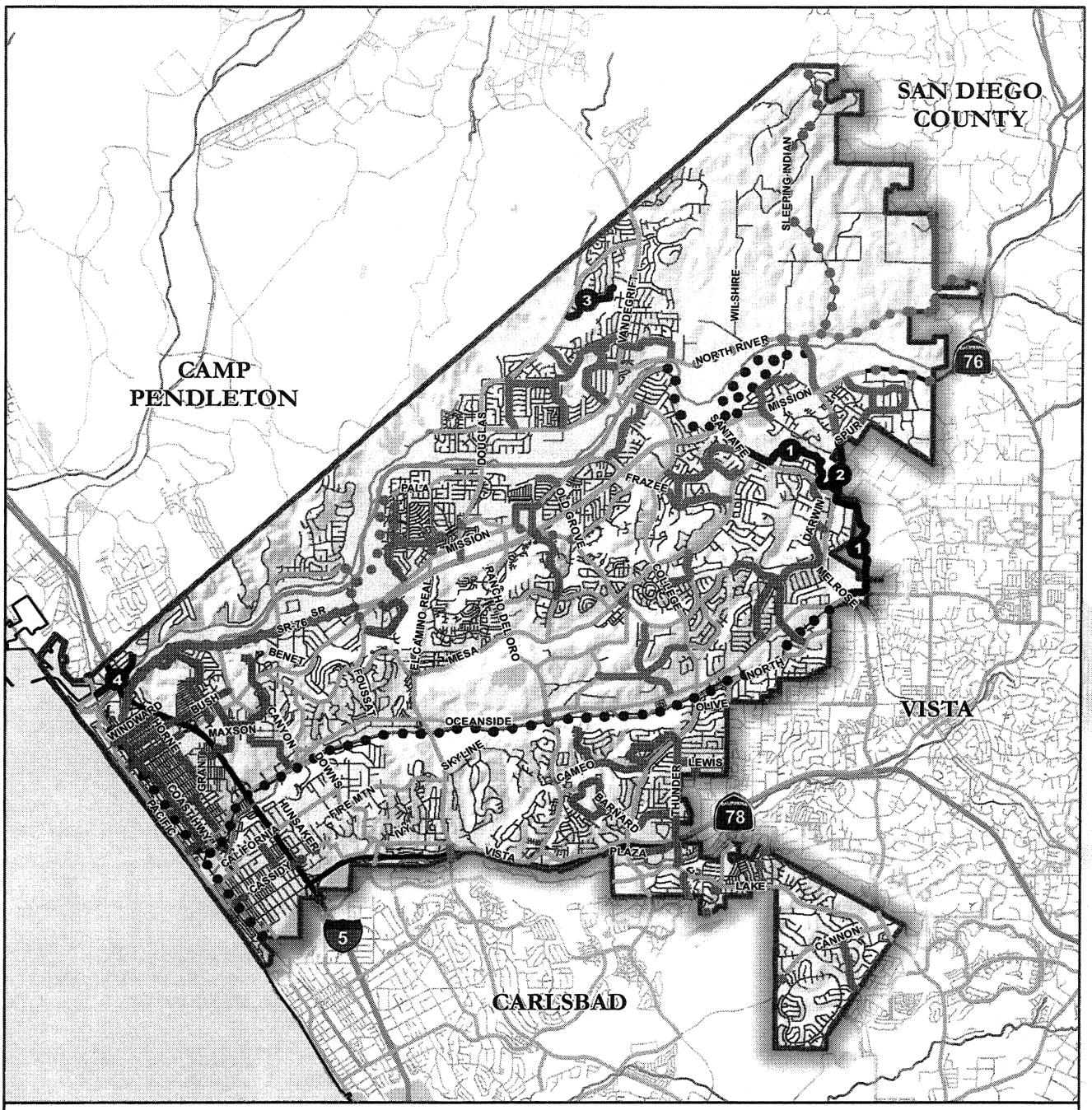
4.2.3 Class 3 Bike Routes

Recommended Class 3 Bike Routes

Segment Numbers	Length (ft)	Length (miles)	Class 3 Bike Routes	Destinations	Notes
1	8,047	1.52	North Cleveland Street/Seagaze Street/South Tremont Street between Neptune Way and Oceanside Boulevard	Oceanside Transit Center, San Luis Rey River Trail, commercial, Regal Cinemas	Move stops signs at Missouri St and Wisconsin Ave onto the aforementioned streets to create a continuous route along Tremont Street
2	2,190	0.41	South Ditmar Street between Wisconsin Avenue and Oceanside Boulevard	Ditmar Elementary,Mary Star of the Sea Elementary, residential	
3	4,454	0.84	Horne Street between Surfrider Way and Grant Street	Oceanside High School, residential	
4	5,943	1.13	San Diego Street/Bush Street/Civic Center Drive/Archer St between North Cleveland Street and Canyon Drive	Oceanside Public Library, City Hall, commercial, residential	
5	7,861	1.49	Loretta Street/Langford Street/Laurel Street/San Diego Street between SR-76 and Canyon Drive	SR-76, Joe Balderrama Recreation Center, Laurel Elementary, residential, commerical	
6	6,491	1.23	Willow Avenue/Carey Road/Foster Street/Grace Street/Dixie Street/Barnes Street/Maxson St/Country Club Ln between Jefferson Middle School and Mission Avenue	Jefferson Middle School, Burgener Academy, Challenges Community Day, Oceanside Unified School District office, Senior Citizens Center, Victory Christian School, School of Business and Technology and a Park and Ride	
7	4,840	0.92	Frontier Drive/Hacienda Drive/Flaminog Drive/Las Vegas Drive between Mission Avenue and Foussat Road	Park and Ride, Pacific View Charter, residential	
8	3,308	0.63	Academy Road/Private Rd/Via Santa Maria along Mission Avenue	Old Mission Montessori, O'Keefe Field, Tri_City Inline Park, North County Alano Club, San Luis Rey homes	If Frazee Rd will connect in the future, this route will allow access to the school from adjacent neighborhoods. Via Santa Maria is primarily a narrow road to access the Montessori from Mission Avenue.
9	21,337	4.04	Moonstone Bay Drive/Marblehead Bay Drive/Calle Montecito/Claire Drive/Monica Circle/Macario Drive/Roja Drive/Cardiff Bay Drive/ Elaine Avenue/Redondo Drive/Calle De Palo/Festival Dr/Gold Drive between Douglas Drive and North River Road and Vandergrift Boulevard	Reynold Elementary, Pacifica Elementary, Kids of the Kingdon, Libby Elementary, Libby Lake Skate Park, residential	Bicycle access issues on Monica Cr towards Macario Dr. Bollards block the sides of the lane forcing bicycles to go over speed bumps going both uphill and downhill.
10	4,169	0.79	Gold Drive/Barry Street/Leon Street between Vandergrift Boulevard and North River Road	Melba Bishop Recreation Center, Del Rio Elementary, residential, commercial	
11	3,936	0.75	Oleander Drive/Gardenia Street/Adams Street between College Boulevard and Frazee Road	Cesar Chavez Middle School, Mance Buchanon Park, San Luis Rey River Trail, residential	
12	9,728	1.84	Jeffries Ranch Road/Wagon Wheel Drive/Spur Avenue/Buckboard Drive/Del Mar Road between SR-76 and Melrose Drive	Mission Meadows Elementary, residential	
13	14,313	2.71	Silver Bluff Drive/Masters Drive/Corona Drive/Alamosa Park Drive/Rio Plata Drive/Robinwood Drive/Muirwood Drive/Summerhill Drive/Sagewood Drive between College Boulevard and Mesa Drive	Alamosa Park Elementary, Roosevelt Middle School, Alamosa Park, residential	
14	7,009	1.33	Temple Heights Drive between Pine Ridge Road and North Avenue	Sprinter line, Temple Heights Elementary, residential	

Recommended Class 3 Bike Routes (continued)

Segment Numbers	Length (ft)	Length (miles)	Class 3 Bike Routes	Destinations	Notes
15	1,389	0.26	Avenida Empresa between College Boulevard and Avenida De La Plata	Empresa Elementary, residential	
16	7,205	1.36	Thunder Road/Lewis Road/Cedar Road between College Boulevard and Vista Way	John Landes Recreation Center, Childrens Hospital, residential	Thunder Road is a heavily travelled road parallel to College Blvd access primarily residential and some commerical offices. Lots of stop signs along this stretch. Some stop signs can be placed on the incoming streets to allow bicycles a continuous route along Thunder Road.
17	12,301	2.33	Cameo Drive/Brandeis Drive/Kelton Drive/Marvin Street/Sherbourne Road/Thunder Road between Rancho Del Oro and College Boulevard	McAuliffe Elementary, Sherbourne Park	Brandeis Drive is a steep climb from Cameo Drive
18	4,049	0.77	Plaza Drive and Thunder Road between College Boulevard and Lake Boulevard	City of Vista, Tri-City Crossroads, College Plaza	
19	2,957	0.56	Shadowridge Drive between Cannon Road and City of Vista	City of Vista, residential	
20	4,304	0.82	Via Puerta Del Sol between North River Road and Bonsall	Rural residential	
21	2,012	0.38	Stewart St between California Street and Cassidy Street	Residential	
22	4,800	0.91	Maxson Street/Grace Street and Greenbrier Drive between Country Club Lane and Oceanside Boulevard	Senior Citizens Center, Victory Christian School and a Park and Ride	
23	4,191	0.79	Mission Gate Drive between Via Rancho Road and Mission Avenue	Residential	
24	11,883	2.25	Darwin Drive and Peacock Boulevard between Oceanside Boulevard and North Santa Fe Avenue. Sagewood Drive	Residential	
25	5,753	1.09	Barnard Drive around Mira Costa College	Mira Costa College	
26	2,892	0.55	Waring Road between College Boulevard and Thunder Road	Residential	
27	1,493	0.28	Mira Monte Drive between Lake Boulevard and city limit	Residential	
28	2,776	0.53	Fireside Street between Los Arbolitos Blvd and Mission Avenue	Residential	Planned Class 2 but roadway configurations and on-street parking won't allow bike lanes
29	2,580	0.49	Surfrider Way between Pacific Street and Horne Street	Residential, commercial, motels	
30	1,012	0.19	Oceanside Boulevard between Coast Highway and Pacific Street	PCH 101, Alan's Family Bike Shop	Contiues the Class 2 bike lanes to the recommended bike route on Tremont Street
31	4,076	0.77	Cranberry Street and Guajome Lake Rd	Guajome Park	
32	3,571	0.68	Mission Avenue between I-5 and Pacific Street	Beaches, commercial	Completes a bike facility from I-5 to the beach. Sharrows recommended due to high traffic volumes and on-street parking
Totals	**182,870**	**34.6**			



Existing Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Planned Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

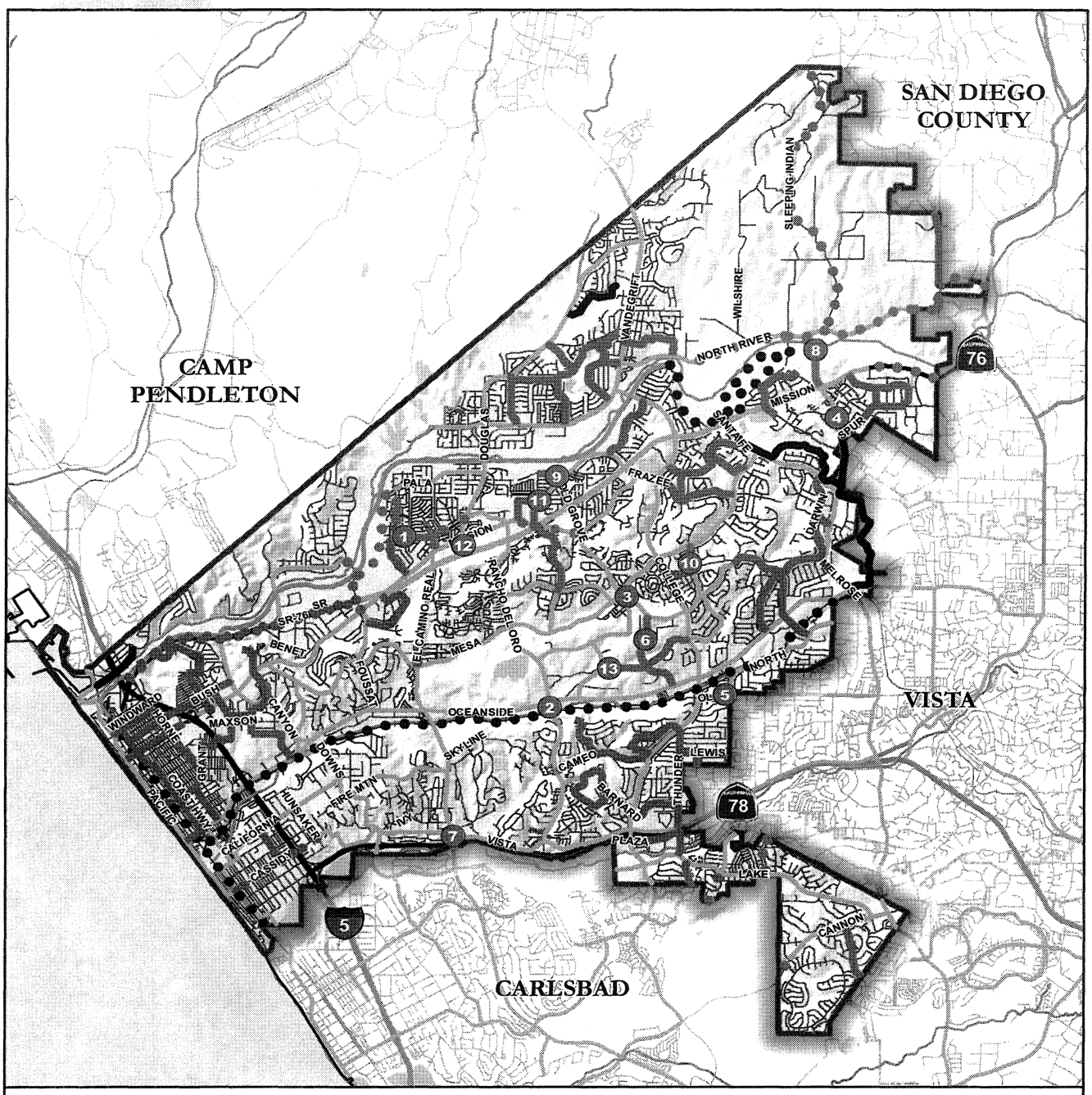
Recommended Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Data Source: City of Oceanside General Plan (1995) & KTU+A (2008)

Figure 4.1 Class 1 Bike Path Recommended Projects

0 0.5 1
Miles



Existing Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Planned Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

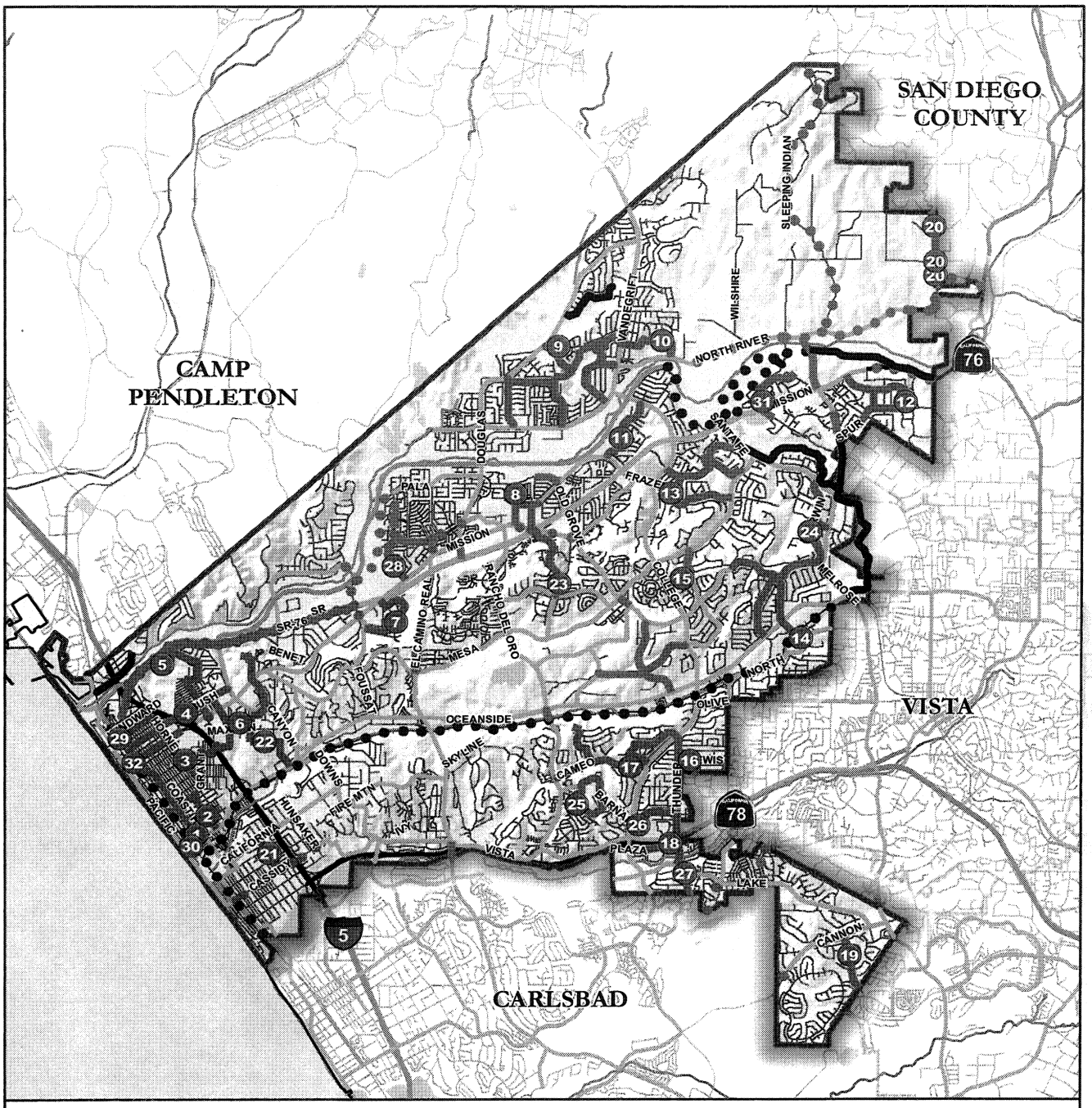
Recommended Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Data Source: City of Oceanside General Plan (1995) and KTU+A (2008)

Figure 4.2 Class 2 Bike Lane Recommended Projects

0 0.5 1
Miles



Existing Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Planned Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

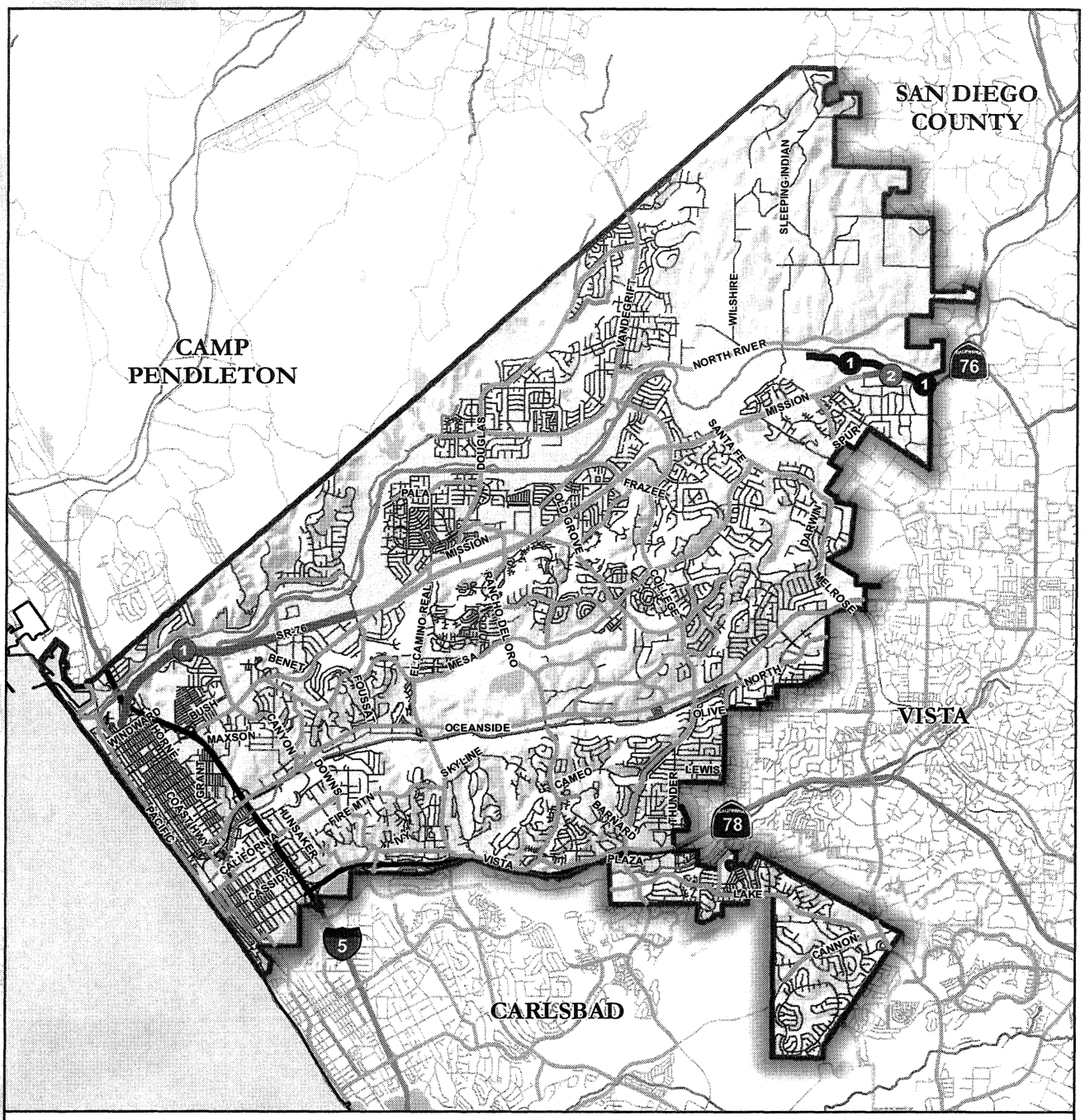
Recommended Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Data Source: City of Oceanside General Plan (1995) and KTU+A (2008)

Figure 4.3 Class 3 Bike Route Recommended Projects

0 0.5 1
Miles



Existing Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Recommended Facilities

- Class 1: Bike Path
- Class 2: Bike Lane

Planned Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Data Source: City of Oceanside General Plan (1995) & KTU+A (2008)

Figure 4.4 Recommended Projects on Caltrans Rights-of-Way

0 0.5 1 Miles

4.3 Additional Recommended Improvements

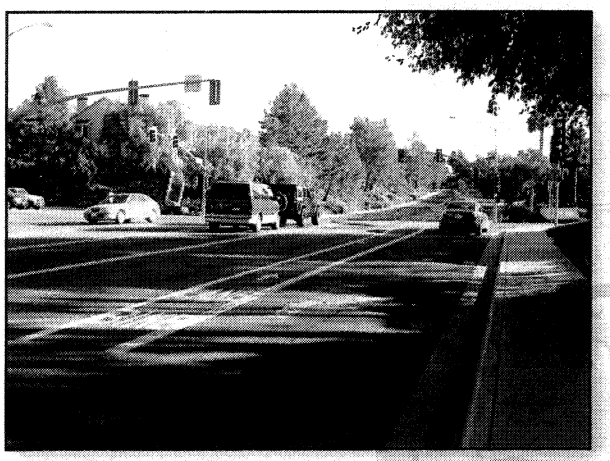
4.3.1 Bicycle facilities configurations at intersections

The most prominent bicycle facility hazard in the City is at intersections where bike lanes are to the right of right-turn-only lanes.

Examples of intersections with this current configuration are:
Douglas Road at North River Road
Lake Boulevard at Thunder Road
College Boulevard at Waring Road
Oceanside Boulevard at El Camino Real
Foussat Road and SR-76
North River Road at College Boulevard
Old Grove Road at College Boulevard
Vista Way at El Camino Real

CALTRANs Chapter 1000 Figure 1003.2C illustrates bike lanes going through the intersection should be on the left side of the right-turn only lane. Bicyclists would travel across the right-turn-only lane to enter the bike lane that allows them to travel through the intersection. It is recommended that intersections that deviate from this configuration be re-striped to conform to CALTRANs standards. Consistency is important and approximately one mile from the Lake Boulevard and Thunder Road intersection is a correct configuration at Lake Boulevard and Cannon Road. Lane width and adequate space are constraints that need to be assessed when re-striping for bike lanes.

Two right-turn only lanes with no bike lanes at the intersection (Douglas Drive at North River Road)



A correctly installed bike lane (Lake Boulevard at Cannon Road)

4.4 Mountain Bike and Trail Opportunities

There is an estimated 3,200 acres of open space and public land within the community in which three miles of natural surface trails are open to mountain bikes. Coordinating with trail advocacy groups such as the San Diego Mountain Biking Association to site and develop a system that could include singletrack trails would be a beneift to the City. Development of bike skills parks or pump tracks will also help encourage bicycle riding throughout the city. There are currently no BMX tracks, velodromes or mountain bike centers within the community.

The following seven sites have been identified as opportunities for bike skills parks and trail opportunities. See Figure 4.5 Mountain Bike Trail and Bike Park Opportunities.

1. Ron Ortega Recreation Park (15 acres on Division Street and Brooks Street)
2. El Corazon (Oceaniside Bouelvard and El Camino Real)
3. Oak Riparian Park (Lake Boulevard and Ridge Road)
4. Tulle Canyon (off of Benet Road)
5. Whelan Ranch Bird Sanctuary
6. City designated open space canyon behind Joseph Sepulveda (17 acres at the ends of Wooster Drive and Colgate Drive)
7. West of Fireside Park (Fireside Street)

Donating helmets to children at a local fair

4.5 The Five Es of a Bicycle Friendly Community

The City of Oceanside is in the process of applying for a Bicycle Friendly Community designation from the League of American Bicyclists. In 2007, the City was given an Honorable Mention for their efforts in improving the City's bicycle community through the "Five Es": Engineering, Education, Encouragement, Enforcement and Evaluation and Planning. The City must demonstrate achievements in each of the five categories to be considered for an award. Communities with more significant achievements in these areas receive superior awards, called Bronze, Silver, Gold and Platinum. The following are the League of American Bicyclists' Five Es recommended actions needed to improve bicycling throughout the City.

4.5.1 Engineering

Communities are asked about what is on the ground; what has been built to promote cycling in the community. For example, questions in this category inquire about the existence and content of a bicycle master plan, the accommodation of cyclists on public roads, and the existence of both well-designed bike lanes and multi-use paths in the community. Reviewers also look at the availability of secure bike parking and the condition and connectivity of both the off-road and on-road network.

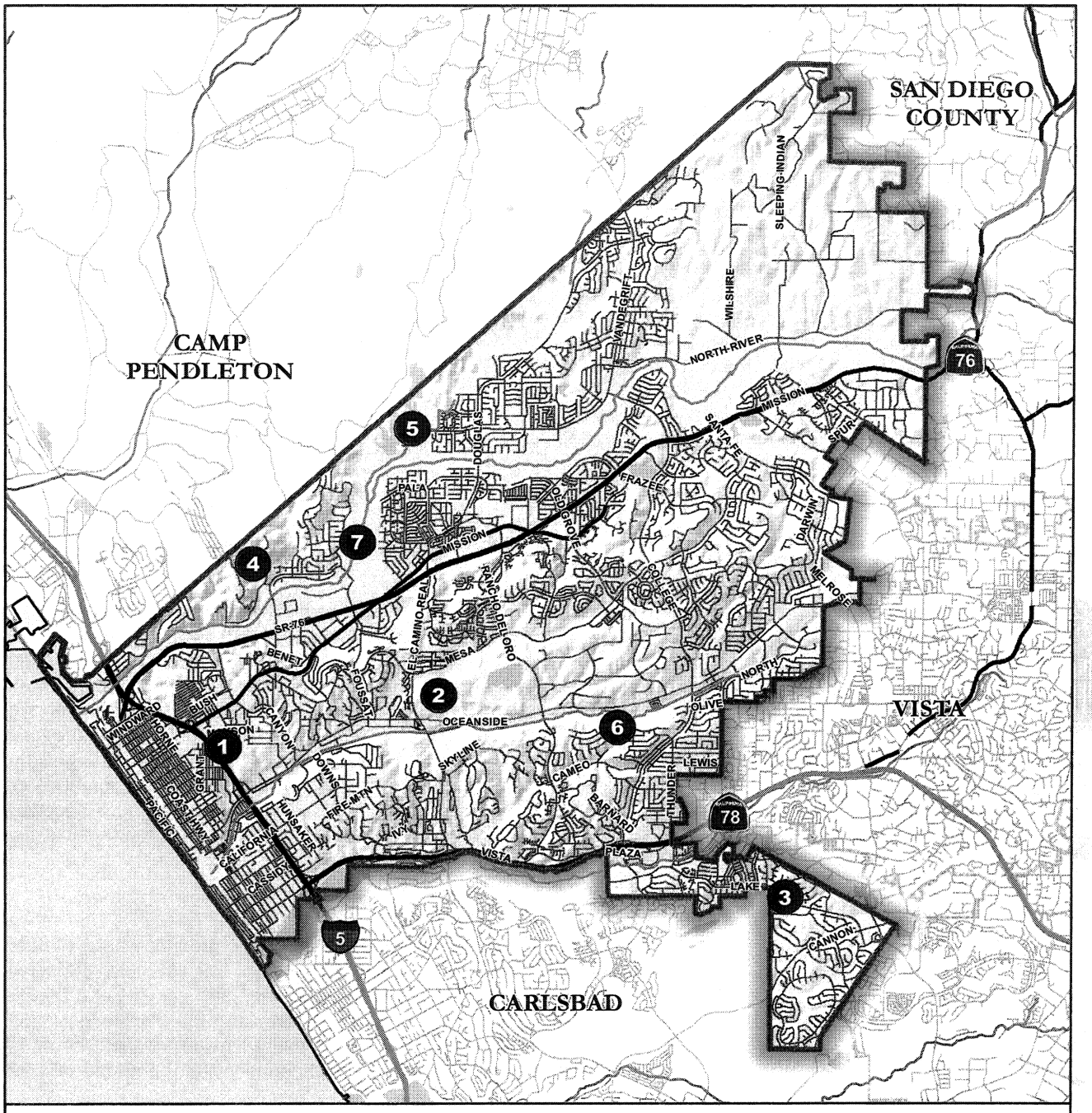
Recommended Actions:

1. Consider adopting a "complete streets" policy.

Every street should accommodate bicyclists, pedestrians, motorists and transit users. A complete streets policy will enhance the effectiveness of bicycle use throughout the City by having facilities that will accommodate bicycle travel as well as pedestrian use and motorists.

2. Continue to expand the bicycle network connectivity.

On-street improvements and expanding the trail system will increase use and improve safety. More facilities within the bicycle network will encourage bicycle use as a transportation and recreation mode. Motorists will note increased bicycle use throughout the City, thus informing them to share the road.



City of Oceanside
Surrounding Cities
Highways
Roads
Rivers

1. Ron Ortega Recreation Park
2. El Corazon
3. Oak Riparian Park
4. Tulle Canyon
5. Whelan Ranch
6. Open space behind Shelbourne Park
7. Open space west of Fireside Park

Figure 4.5 Mountain Bike and Bike Park Opportunities

0 0.5 1
Miles

Data Source: SanGIS and KTU+A (2008)

3. Provide training opportunities for engineering, planning staff and law enforcement on how to accommodate bicyclists.
Host an education course for City staff to better understand cyclists' needs and behavior, their right to use City streets, as well as multi-use paths for transportation.

4. Increase the amount of secure bicycle parking.
Increasing bike parking especially in areas of high bicycle traffic will encourage the use of bicycles and give the cyclists a safe place to park their bikes. Increase bicycle parking such as lockers or even a secured/fenced off area near or in areas of high employment densities. If there is a safe place to park their bicycles, employees may be more inclined to commute by bicycle to work.

BikeEd Road 1 Course

4.5.2 Education

The questions in this category are designed to determine the amount of education available to both cyclists and motorists. Education includes teaching cyclists of all ages how to ride safely in any area, from multi-use paths to congested city streets, as well as teaching motorists how to share the road safely with cyclists. Some things that reviewers look for are the availability of cycling education for adults and children, the number of League Cycling Instructors in the community, and other ways that safety information is distributed to both cyclists and motorists, including bike maps, tip sheets, and as part of driver's education manuals and courses.

Recommended Actions:

1. Expand motorist education efforts.
Install additional "Share the Road" signage and include the "Share the Road" message in local driver's education classes. Educating motorists and bicyclists alike is an important tool for the safety of those using the roads. The more people that know the rights and rules each party has, the less potential there is for conflict and incidents.

Network signage needs to be improved. Signage particularly on Class 3 Bike Routes need to be improved and placed where they belong, near an intersection and throughout the route to direct bicyclists who are traversing that route. Direction and destination signage should be placed to inform cyclists of the route to their destination or nearby landmark.

2. Get bicycling motorist education messages added to routine local activities.
Increased education for motorists and cyclists is needed. Getting more people on bikes will also help modify motorists' behavior. As of now, the primary method of education being used to reach both motorists and bicyclists is the LAB's BikeEd Road 1 course. More educational opportunities such as bike rodeos, public service announcements and increased education at schools are opportunities to be investigated to increase awareness within the city and to demonstrate to more people that bicycling to work or for recreation is easy, safe and fun. Oceanside's focus is to continue improving all types of facilities and providing connections between them.

3. Expand the Safe Routes to School program and encourage all schools to get involved.
Encouraging schools to participate in the Safe Routes to School Program may increase the number of children that ride their bikes or walk to school. Inactivity among children is a health issue, one that must be taken seriously. In the age of computers, the Internet and enhanced video games, outdoor activity has taken a back seat to indoor entertainment. Bicycling to school is a way to get children active and to introduce exercise into their daily routine. Many parents feel that riding a bike on the street is unsafe and do not allow their children to ride to school. Bicycle safety education is important and can be incorporated into after- school activities for both children and parents.

4.5.3 Encouragement

This category concentrates on how the community promotes and encourages bicycling. This can be done through Bike Month and Bike to Work Week events as well as producing community bike maps, route finding signage, community bike rides, commuter incentive programs, and having a Safe Routes to School program. In addition, some questions focus on other things that have been built to promote cycling or a cycling culture such as off-road facilities, BMX parks, velodromes, and the existence of both road and mountain bicycling clubs.

Bike to Work Day station

Recommended Actions:

1. Expand encouragement efforts during Bike Month.
Have the Mayor and/or the City Council proclaim May as Bike Month and participate in Bike to Work Week events. Continue hosting pit stops during Bike to Work weeks and Days. Continue advertising through the Oceanside Magazine and the local television station KOCT.

2. Develop a series of short (2-5 mi.) loops rides around Oceanside.
Provide way-finding signage. Integrate these rides into local bike map. Continue with the City of Oceanside Historic Bike Tour, the Race Across America (RAAM) start and hosting triathlons. Start local races that showcase Oceanside's landmarks. Local races can draw attention to the City and at the same time encourage cycling as a fun and healthy sport.

3. Improve bicycle route wayfinding markers.
Signage needs to be improved because directional signage along Class 3 Bike Routes is almost non-existent. Installation of the signs will allow new cyclists and tourists alike to find their way to their destination or nearby landmark.

4.5.4 Enforcement

The enforcement category contains questions that measure the connections between the cycling and law enforcement communities. Questions address whether or not the law enforcement community has a liaison with the cycling community, if there are bicycle divisions of the law enforcement or public safety communities, if the community uses targeted enforcement to encourage cyclists and motorists to share the road safely, and the existence of bicycling related laws such as those requiring helmet or the use of side paths.

Recommended Actions:

1. Encourage the Police Department to use targeted enforcement to encourage motorists and cyclists to share the road.
This could be in the form of a brochure or tip card explaining each user's rights and responsibilities. Inform the Police Department to warn and educate cyclists about breaking the laws, the rules of the road and safety procedures. This will help educate law enforcement, motorists and cyclists.

4.5.5 Evaluation and Planning

Here the community is judged on the systems that they have in place to evaluate current programs and plan for the future. Questions are focused on measuring the amount of cycling taking place in the community, crash and fatality rates, and ways that the community works to improve these numbers. Communities are asked about whether or not they have a bike plan, how much of it has been implemented and what the next steps for improvement are.

Recommended Actions:

1. Improve access to public lands for mountain bicyclists.
Improve bicycle network connectivity to open space. Connections to off-road trail heads would expand bicycle use within the City as mountain bikers can access trail heads through on-street facilities.

2. Work with the mountain biking community to develop a plan for off-road access.
Increase opportunities for single-track riding within the City. Increasing the number of trails and access to them is another way to improve the recreational aspects of the City and will allow a mixed use of hikers and cyclists alike to explore the City's opens space areas. Work with organizations such as the San Diego Mountain Biking Association to plan and build sustainable trails through available open space. Experienced members of this organization can assist in planning and developing bike parks as well.

3. Integrate development of the cycling network into larger land use planning and development projects.
Future developments such as office complexes, parks and neighborhoods need to take into account bicycles as a mode of transportation, thus incorporating facilities to meet their needs. Bike racks, bike lockers and even secured parking are a few examples of incorporating facilities within new developments, along with bike paths and bike lanes.

4.6 Additional Recommendations

4.6.1 Canyon Drive and Oceanside Boulevard

This recommendation is to reconfigure the intersection to eliminate the sweeping right turn and allows the placement of traffic signals or stop signs as appropriate.

Figure 4.6 depicts existing conditions overlaid with the recommended solution to the problem.

4.6.2 Melrose Drive and North Santa Fe Road

This is a "T" intersection where northbound Melrose Drive terminates at North Santa Fe Road. There are two left-turn-only lanes and one right-turn-only lane on Melrose Drive onto North Santa Fe Road. Bike lanes between Sagewood Drive, the nearest cross street to the south, and North Sante Fe Road do not exist, creating a gap in the system. Once at the intersection, cyclists must maneuver into the appropriate lane that allows them to continue onto their destination. Cyclists wanting to turn right can remain to the right within the single right–turn-only lane and make the turn without impeding motor vehicle traffic. However, cyclists wanting to turn left must navigate across the right-turn-only lane and only the most experienced are likely to be aware that they should maneuver to a position in the right third of the rightmost left-turn-only lane.

A bike lane between the rightmost left-turn-only lane and the right-turn-only lane is recommended to complete the connection. The recommendation is to follow the Caltrans standard in which bike lanes passing through an intersection are to be on the left of right-turn only lanes. In this case, the bike lane passing through will be a left-turn-only bike lane onto North Santa Fe Drive. Right turning cyclists can continue to use the right-turn-only lane.

Figure 4.7 depicts existing conditions overlaid with the recommended solution to the problem.

Figure 4.6 Canyon Drive and Oceanside Boulevard

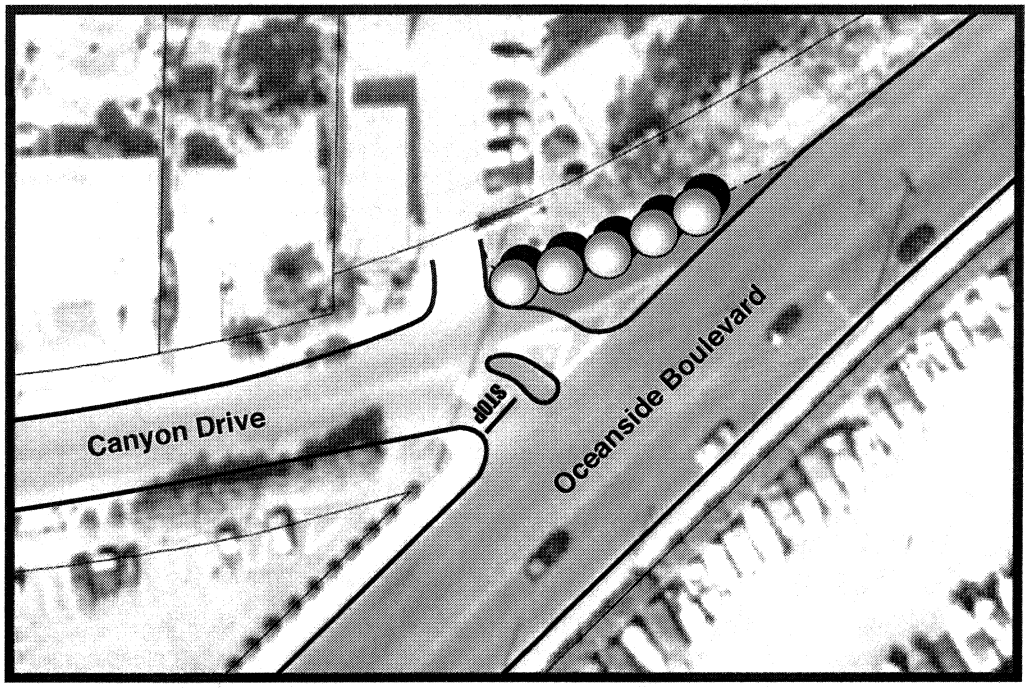
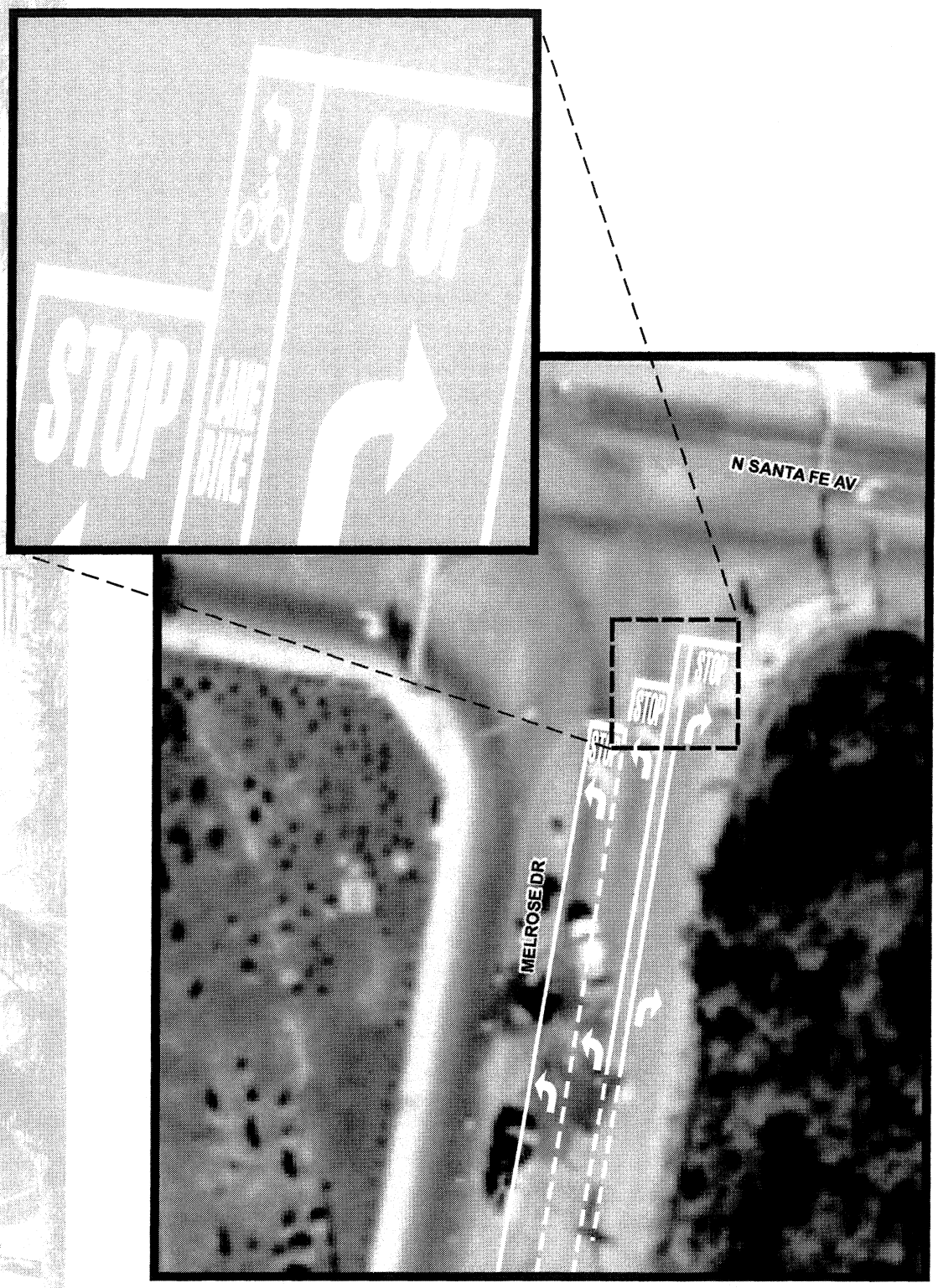
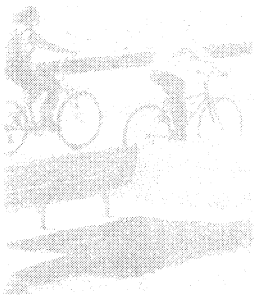


Figure 4.7 Melrose Drive and North Santa Fe Road



SHARE
THE
ROAD



5 Prioritized Routes and Bikeway Funding

5.1 Facility Priority Criteria and Implementation

The projects in this chapter are a combination of planned and recommended bicycle facilities. Since the planned projects have yet to be implemented, prioritizing them with recommended projects subjects all the projects to the same criteria for priority and implementation. These projects were itemized into two categories: Top Priority and Second Priority. Top Priority Projects are those that will have a significant impact in the existing bikeway system such as closing major gaps and extending or developing bike paths, lanes or routes along major transportation corridors. Second Priority Projects are projects that will significantly enhance the safety and bikeway system throughout the City as well as fill in minor gaps. The recommended projects followed the following prioritization criteria to help identify which routes are likely to provide the most benefit to the City bikeway system:

The numbering used to identify projects within each bikeway facility class in the following sections does not necessarily imply priority. Bikeway facility implementation has no specific time line, since the availability of funds for implementation is variable and tied to the priority of the City's capital projects.

Mobility and Access (total of 12 points)

1. Volume of existing or potential bicycle traffic: 1 - 3 points
- High volume - 3
- Moderate volume - 2
- Little to no volume - 1

2. Provides access to major bicycle traffic generators: 1 - 3 points
- Provides access to areas of high bicycle traffic generation - 3
- Moderately access to areas of high bicycle traffic generation - 2
- Low access to areas of high bicycle traffic generation - 1

3. Closes gap in significant route: 1 - 3 points
- Closes a gap in an existing high bicycle traffic facility - 3
- Closes a gap in a non-existent high bicycle traffic facility - 2
- Closes a gap to connect facilities with little bicycle use - 1

4. Adequate access to activity centers and transit sites: 1 – 3 points
- Provides direct access to an activity center and/or transit center - 3
- Provides indirect access to an activity center and/or transit center - 2
- Route is not near an activity center and/or transit center - 1

Safety (total of 9 points)

5. Remedies or improves specific obstacles: 1 - 3 points
- Directly improves bicycle safety - 3
- Moderately improves bicycle safety - 2
- Slightly improves bicycle safety but is important to the bikeway system - 1

6. Improves locations where bicycle crashes have occurred: 1 - 3 points
- Bicycle collisions have occurred directly on this route - 3
- Bicycle collisions have occurred on near this route - 2
- No collisions have occurred on this route - 1

7. Improves routes with high vehicular traffic volumes: 1 - 3 points
- Improves routes with high average daily trips - 3
- Improves routes with moderate average daily trips - 2
- Improves routes with low average daily trips - 1

Existing Conditions (total of 6 points)

8. Route a continuous right-of-way: 1 – 3 points
- The route has very few stop signs and/or is continuous on one street - 3
- The route has moderate stop signs and/or continues on no more than 2-3 streets - 2
- The route has many stops signs and/or continues along numerous streets - 1

9. Roadway able to accommodate bikeways: 1 – 3 points
- Roadway currently can accommodate the recommended facility with no construction and/ or redesign - 3
- Roadway can accommodate the recommended facility with some construction and/or redesign - 2
- Roadway will need significant construction and/or redesign to accommodate the recommended facility - 1

Regional Significance (total of 6 points)

10. Route has regional significance in the bikeway system: 1 – 3 points
- High significance, connects major bicycle facilities and activity centers - 3
- Moderate significance, connects some routes and activity centers - 2
- Little significance, does not directly connect to activity centers, bicycle trip generation, but is still important in the bikeway system - 1

11. Route has aesthetic attributes: 1 – 3 points
- Most of the route has significant aesthetic attributes, such as visible open space, waterway corridors, parks, beaches, etc - 3
- Some of the route has moderate aesthetic attributes, such as visible open space, waterway corridors, parks, beaches, etc - 2
- Little to none of the route benefits from open space, waterway corridors, parks, beaches, etc - 1

Ability to Implement (total of 6 points)

12. Route or project has full or partial funding, or is likely to be funded: 1 - 3 points
- Route is important to the bikeway system and can get funding based on cost and priority - 3
- Route is important to the bikeway system and has some obstacles, such as priority, cost, construction and further studies - 2
- The route is important to the bikeway system but has many obstacles such as environmental reviews, ownership issues, construction and total cost - 1

13. Route or project is contained in a specific plan: 1 - 3 points
- Route already in a City Plan - 3
- Route in a City Study - 2
- New Route not in a City Plan or Study - 1

The maximum possible score is 39 points. Proposed projects can be rated periodically at whatever interval best fits funding cycles or to take into consideration the availability of new information, new funding sources, updated crash statistics, etc. Bikeway facility prioritization and implementation should be fine-tuned and adjusted accordingly based on future circumstances.

Top Priority Projects = 30-39 points
Second Priority Projects = 13-29 points

The cost of each project will always be a consideration. For example, if two projects with a high cost differential score within five points of each other based on the priority criteria, it may make sense to implement the lower cost project ahead of the higher cost project. See Figure 5-2: Top Priority Projects and Figure 5-3: Second Priority Projects for maps of the prioritized projects.

5.2 Typical Construction Costs

Bikeway facility construction costs vary widely depending on facility type. A list of typical unit construction costs in dollars is shown in Figure 5-1. Though useful for preliminary cost estimates, they do not reflect potential special circumstances such as the long bridges that would be needed to span rail lines or freeways, for instance. The following sections provide generalized costs per mile for each class of bicycle facility, as well as what these costs cover, and just as importantly, what they do not. Because typical cost references often do not accurately reflect local construction cost realities, these cost estimates were based on comparisons of bikeway facility projects recently completed in the San Diego County metropolitan region.

Figure 5-1 Typical Construction Costs

Description	Unit	Unit Cost
Clearing and Grubbing	Linear Foot (LF)	$10.00 - $30.00
Excavation	Cubic Yard (CY)	$30.00 - $40.00
Asphalt Pavement (4")	Square Foot (SF)	$1.20 - $1.50
Polymer-Stabilized Soil	Square Foot (SF)	$1.00 - $2.50
Bike Lane Striping	Linear Foot (LF)	$0.60 - $0.80
Pavement Markings	Each (EA)	$40.00 - $50.00
Fencing (Chain Link)	Linear Foot (LF)	$16.00 - $20.00
Guardrail	Linear Foot (LF)	$20.00 - $25.00
8' Steel or Concrete Bridge	Linear Foot (LF)	$1,200 - $1,500
36" Retaining Wall (Concrete)	Square Foot (SF)	$32.00 - $40.00
Relocate Signs/Fencing	Linear Foot (LF)	$1.00 - $2.00
Drainage	Linear Foot (LF)	$1.00 - $5.00
Traffic/Bike Path Signage	Linear Foot (LF)	$2.40 - $3.00
Lighting	Each (EA)	$500.00
Traffic Control	Linear Foot (LF)	$0.20 - $0.40
Clean Up	Linear Foot (LF)	$0.10 - $0.20

To subtotal above, add 20% for contingencies, 10% for engineering and design, 5% for administration and 7% for construction management

Source: 2005 estimates from San Diego County Projects (Kimley-Horn & Associates, Inc)

5.2.1 Class 1 Bike Path Facilities

Because they are constructed independently of existing or programmed motor vehicle facilities, Class 1 paths are by far the most expensive of all bicycle facilities. Typical costs per mile can vary a great deal due to possible right-of-way acquisition, bridges and other potential major expenses such as extensive grading that can result from hilly topography and facility width. For example, a Class 1 facility being converted from a defunct rail roadbed across flat terrain will require far less grubbing, grading and structural enhancements than a facility being constructed through an undeveloped area with hilly topography. The cost used to determine Class 1 priority was $326 per linear foot, or approximately $1,722,507 per mile. This cost came from a previous project that included extensive construction, grading, bridges and environmental review. (Source: City of Encinitas.)

5.2.2 Class 2 Bike Lane Facilities

Class 2 facility costs are approximately $15,000 to $35,000 per mile. This cost includes all necessary lane striping and signage, but does not include roadway widening. The cost variation is primarily due to the amount of striping and signage installed. For example, costs will be higher where substantial re-striping is needed, or right-of-way acquisition required. The cost used in the Class 2 priority lists was $6 per linear foot, or approximately $32,000 per mile.

5.2.3 Class 3 Bike Route Facilities

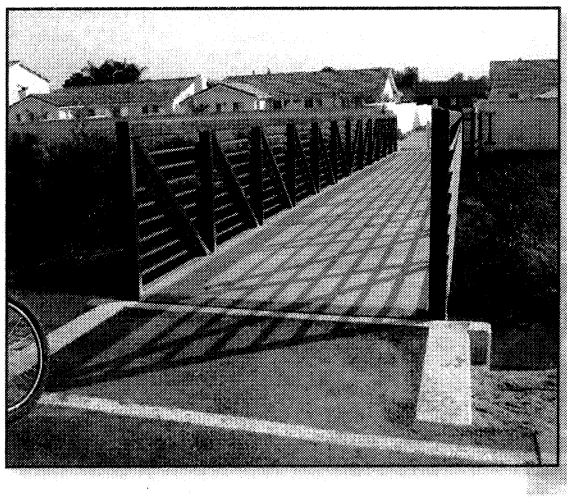
Class 3 routes costs are the lowest of all facility types because the only physical improvement to be installed is route signage. The cost range of $1,500 to $5,000 per mile is due to the distance between signs, which can vary considerably depending upon factors such as horizontal and vertical curvature, the number the intersections and curb cuts, and how often the route changes direction onto different roadways. The cost used in the Class 3 priority lists was $0.70 per linear foot, or approximately $3,500 per mile. For the City of Oceanside, Shared Lane Markings have already been implemented at a cost of $75 per symbol. The Class 3 priority tables also calculate how many markings would be needed along the route and an associated cost. Markings are to be painted on the street at no more than 250 foot intervals along the length of the route.

5.2.4 Bikeway Bridge Improvements

The following information concerns bridges designed to serve bicycle facilities in locations other than planned or programmed roadway bridges. Typical roadway bridges are constructed of reinforced concrete to withstand the enormous stresses of motor vehicle traffic and seismic activity. Bridges intended for non-motorized uses do not need to be as robust or as costly as bridges designed for regular motor vehicle use.

Bridges costs depend on design load and foundation, and to a lesser extent, length, width and materials. Bridges must be designed to carry the same loads as the bikeway facility they serve. On Class 1 facilities, for example, where patrol, emergency or maintenance vehicles are expected to use the bridge, it must be able to support at least the gross weight of the heaviest anticipated vehicle. Bridges intended to support motor vehicles will require much sturdier construction and increased width, both of which will increase costs.

Unstable soil conditions will require any bridge to be built with more expensive foundations in the form of larger footings or piers. Wooden bridges tend to be less expensive than metal bridges, though their useful life may be shorter. Bridge costs increase almost exponentially as their height increases due to increased structural complexity. Finally, prefabricated bridges are generally cheaper and less environmentally damaging to install than constructed-in-place bridges. For bridge preliminary cost estimates, $1,500 to $1,750 per linear foot is adequate.



Cypress Street bridge connecting to the San Luis Rey River Trail

5.3 Top Priority Projects

Top Priority Class 1 Bike Path Projects

Segment Numbers	Length (ft)	Length (miles)	Descriptions	Destinations	Notes	Estimated Costs
1	13,966	2.6	Coastal Rail Trail	Portions have been completed between Vista Way and Morse Street. Not enough room along the track north of the transit center to complete the trail system.	San Luis Rey River Trail, City of Carlsbad, Commercial, Residential	$4,600,000
2	37,850	7.2	Oceanside-Escondido Inland Rail Trail	The trail terminates at College Boulevard from Vista and users have to use Oceanside Boulevard to access the beach or downtown Oceanside. Wetland and easement space issues along the rail line still need to be resolved.	Beaches, City of Vista, Commercial, Residential	$12,000,000
3	5,828	1.1	San Luis Rey River Trail Extension	Extension from College Boulevard to North Santa Fe Road. A half-mile section has already been constructed from College Boulevard along Andrew Jackson Street and Polk Street	San Luis Rey River Trail, Guajome Park, Residential	$1,900,000
4	17,495	3.31	Mission Avenue to Inland Rail Trail	Guajome Park, Inland Rail Trail, new Vista park	Coordinate alignment with City of Vista and San Diego County Guajome Park. Coordination with NCTD on connection with Inland Rail Trail.	$5,700,000
Totals	**75,139**	**14.2**				**$24,200,000**

*Cost have been rounded

Top Priority Class 2 Bike Lane Projects

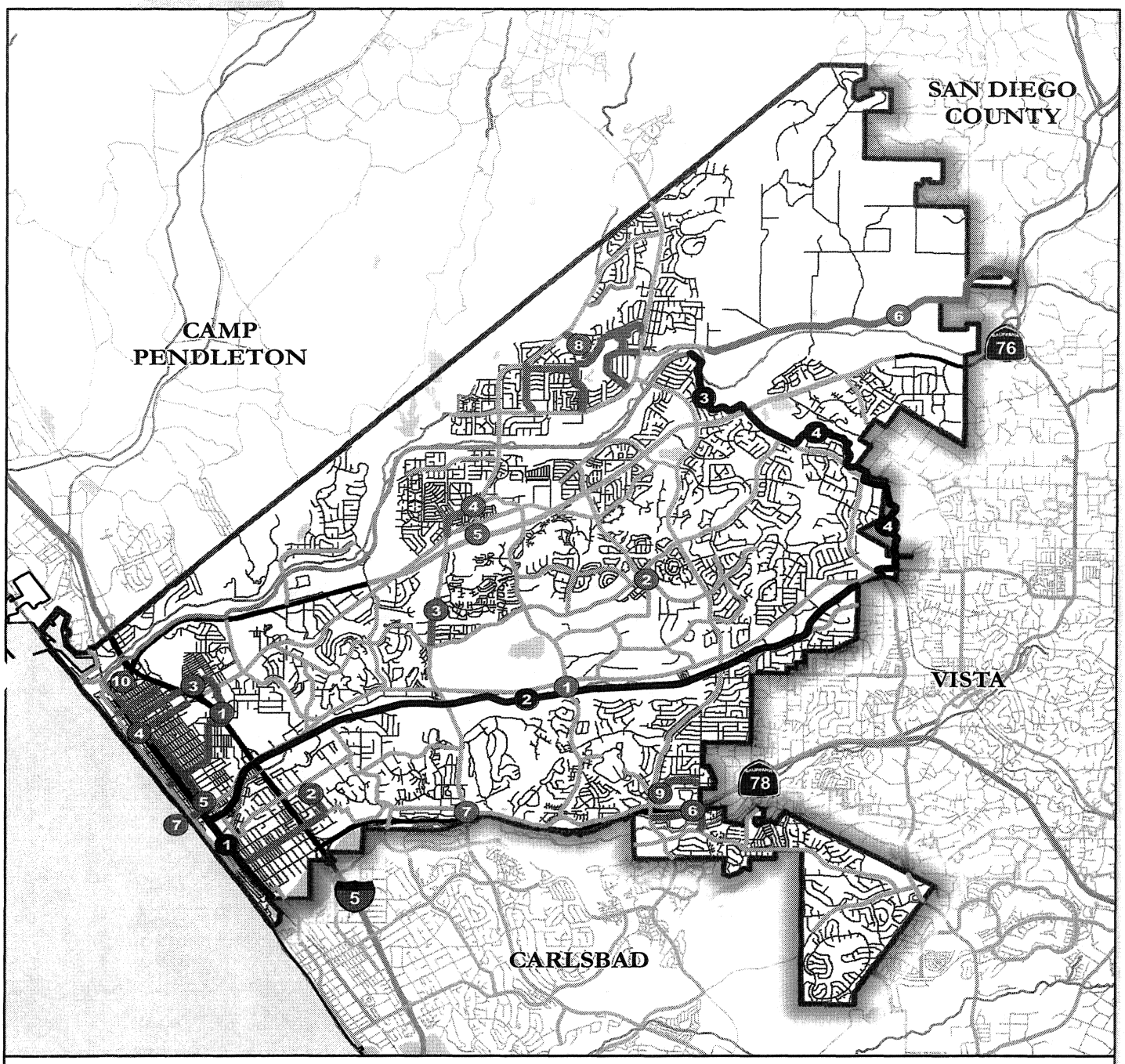
Segment Numbers	Length (ft)	Length (miles)	Descriptions	Destinations	Notes	Estimated Costs
1	566	0.11	Rancho Del Oro between Sprinter tracks and Oceanside Boulevard	Sprinter Station	To fill in the gap of missing bike lanes	$3,400
2	712	0.13	Old Grove Road between Ocean Ranch Blvd and Mesa Dr	Industrial	Eastbound bike lane missing. Westbound bike lanes exist.	$4,300
3	2,778	0.5	El Camino Real between Vista Oceana and Mesa Drive	Commercial, Residential	Bike lanes exist on the northbound lanes between Mesa Drive and Mission Avenue. Southbound bike lanes need to be installed. Bike lanes striping needed in this section	$17,000
4	2,831	0.5	El Camino Real between Mission Avenue and Douglas Drive	Commercial, Residential	Bike lanes exist on the northbound lanes between Mesa Drive and Mission Avenue. Southbound bike lanes need to be installed. Bike lanes striping needed in this section	$17,000
5	847	0.16	Douglas Blvd between Mission Avenue and SR-76	Commercial, Public Storage	Connects the existing Class 2 bike lanes on Mission Avenue and SR-76	$5,100
6	17,876	3.4	North River road between Stallion Drive and east City limit	Melba Bishop Recreation Center, Bonsall, SR-76, Agriculture	Currently an existing Class 3 bike route with high speed traffic. Two-foot shoulders would enhance safety if this continues to be a signed bike route.	$110,000
7	964	0.18	El Camino Real between Vista Way and City of Carlsbad	SR-78, City of Carlsbad	Overpass over SR-78 to complete bike lanes into/from the City of Carlsbad	$5,800
Totals	**26,574**	**5.03**				**$162,600**

*Cost have been rounded

Top Priority Class 3 Bike Route Projects

Segment Numbers	Length (ft)	Length (miles)	Descriptions	Destinations	Notes	Cost with Standard Sigange	Cost of Shared Lane Sumbols	Number of Painted Shared Lane Symbols	Total Cost with Standard Signage and Shared Lane Symbols
1	7,609	1.4	Brooks Street/Division Street/Grant Street/Wisonsin Avenue between Mission Bouelvard and Pacific Street	Utilizes residential streets and an I-5 crossing without on/off ramps to connect Mission Boulevard to the beach area	Brooks Street Swim Center, Park & Ride, Senior Citizens Center, St Mary Star of the Sea Elementary, Beaches, Coastal Rail Trail, Residential	$5,000	$2,300	30	$7,300
2	7,095	1.3	Hunsaker Street and Cassidy Street between California Street and Broadway	Utilizes residential streets and an I-5 crossing with only a southbound on/off ramp to connect California Street to the Coastal Rail Trail	Coastal Rail Trail, I-5, Beaches, South Oceanside Elementary, Residential	$4,700	$2,100	28	$6,800
3	5,943	1.13	San Diego Street/Bush Street/Civic Center Drive/Archer St between North Cleveland Street and Canyon Drive	Oceanside Public Library, City Hall, commercial, residential		$3,900	$1,800	24	$5,700
4	3,571	0.68	Mission Avenue between I-5 and Pacific Street	Beaches, commercial	Completes a bike facility from I-5 to the beach. Sharrows recommended due to high traffic volumes and on-street parking	$2,400	$1,100	14	$3,400
5	8,047	1.52	North Cleveland Street/Seagaze Street/South Tremont Street between Neptune Way and Oceanside Boulevard	Oceanside Transit Center, San Luis Rey River Trail, commercial, Regal Cinemas	Move stops signs at Missouri St and Wisconsin Ave onto the aforementioned streets to create a continuous route along Tremont Street	$5,300	$2,400	32	$7,700
6	4,049	0.77	Plaza Drive and Thunder Road between College Boulevard and Lake Boulevard	City of Vista, Tri-City Crossroads, College Plaza		$2,700	$1,200	16	$3,900
7	1,012	0.19	Oceanside Boulevard between Coast Highway and Pacific Street	PCH 101, Alan's Family Bike Shop	Continues the route to the recommended bike route on Tremont Street	$670	$300	4	$970
8	21,337	4.04	Moonstone Bay Drive/Marblehead Bay Drive/Calle Montecito/Claire Drive/Monica Circle/Macario Drive/Roja Drive/Cardiff Bay Drive/ Elaine Avenue/Redondo Drive/Calle De Palo/Festival Dr/Gold Drive between Douglas Drive and North River Road and Vandergrift Boulevard	Reynold Elementary, Pacifica Elementary, Kids of the Kingdon, Libby Elementary, Libby Lake Skate Park, residential	Bicycle access issues on Monica Cr towards Macario Dr. Bollards block the sides of the lane forcing bicycles to go over speed bumps going both uphill and downhill.	$14,000	$6,400	85	$21,000
9	2,892	0.55	Waring Road between College Boulevard and Thunder Road	Residential		$1,900	$870	12	$2,800
10	2,580	0.49	Surfrider Way between Pacific Street and Horne Street	Residential, commercial, motels		$1,700	$770	10	$2,500
Totals	**64,135**	**12.15**				**$42,270**	**$19,240**	**257**	**$62,070**

*Cost have been rounded



Existing Bicycle Facilities
- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Top Priority Facilities
- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Figure 5-2 Top Priority Projects

0 0.5 1
Miles

Data Source: KTU+A (2008)

5.4 Second Priority Projects

Second Priority Class 1 Bike Path Projects

Segment Numbers	Length (ft)	Length (miles)	Class 1 Bike Paths	Destinations	Notes	Estimated Costs
5	3,085	0.58	Between Harbor Drive and Capistrano Drive	Residential, Oceanside Harbor	To avoid the I-5 interchange at Camp Pendleton. Bike path users would travel underneath I-5 onto Capistrano Drive wich would take them to San Rafael Drive and onto the base	$1,000,000
6	2,797	0.53	Spur Avenue to Melrose Drive and North Santa Fe Avenue	Rural residential, Guajome Park	Possible connection with Melrose Drive extension project	$910,000
7	3,332	0.63	Hi Hope Ranch Bike and Equestrian T	Proposed Melrose Drive connection, planned San Luir River Rey connection	Currently conditioned in the development plans	$1,100,000
8	3,619	0.69	Douglas Drive and Manteca Drive	Residential	Paving exists. Trailheads and signage needed to complete the bike path designation.	$1,200,000
Totals	**12,833**	**2.43**				**$4,210,000**

*Cost have been rounded

Second Priority Class 2 Bike Lane Projects

Segment Numbers	Length (ft)	Length (miles)	Descriptions	Destinations	Notes	Estimated Costs
8	2,981	0.56	Melrose Drive between North River Road and SR-76	Planned Hi Hope Ranch trail system	Can be condition into new development	$18,000
9	4,933	0.93	Avenida Del Oro between Old Grove Road and Oceanside Boulevard	Industrial		$30,000
10	1,368	0.26	North Old Grove Road between Nichols Elementary and Frazee Road	Nichols Elementary School, residential		$8,300
11	6,913	1.31	Avenida De La Plata between Corporate Centre Drive and College Boulevard	Industrial, Commercial		$42,000
12	1,294	0.2	Cannon Road between Mystra Drive and City limit	Complete the connection to the City limit	City of Carlsbad, Residential	$7,800
13	5,439	1.0	Pala Road between Los Arbolitos and Foussat Road	Completes the connection along the south side of the San Luis Rey River	Residential	$33,000
14	3,248	0.6	Foussat Road between Benet Road and Mission Avenue	To complete the Class 2 connection between Benet Road and Mission Avenue	San Luis Rey River Trail, SR-76, Pacific View Charter School, Residential	$20,000
15	1,730	0.33	Olive Drive between College Blvd and City of Vista	City of Vista, Olive Elementary		$10,000
16	3,939	0.7	Mission Avenue between Rancho Del Oro Drive and Old Grove Road	Currently an existing Class 3 bike route	Heritage Park, Old Mission Montessori, Commercial, Residential	$24,000
17	1,527	0.29	Melrose Drive between Old Ranch Road and Spur Avenue	Mission Meadows Elementary	Class 2 bike lanes exist on northbound Melrose but are missing on southbound Melrose from Seattle Slew to Spur Avenue.	$9,300
18	1,525	0.29	Avenida De La Plata between Mesa Drive and Avenida Empressa	Empressa Elementary School, residential		$9,200
19	2,479	0.5	Los Arbolitos Boulevard between Pala Road and Fireside Street	Complete connection between Pala Road and Fireside Street	Residential	$15,000
20	2,115	0.4	Emerald Drive between Lake Boulevard and City limit	Complete Oceanside's portion of Emerald Drive of Class 2 bike lanes with the programmed bike lanes of the City of Vista	City of Vista, Residential	$13,000
21	520	0.10	Frazee Rd	Old Mission Montessori, O'Keefe Field, Tri_City Inline Park, North County Alano Club, San Luis Rey homes	Frazee Rd does not currently extend out to Academy Road	$3,200
22	1,856	0.35	Los Arbolitos between Fireside Street and El Camino Real	Residential		$11,000
Totals	**41,866**	**7.93**				**$253,732**

*Cost have been rounded

Second Priority Class 3 Bike Route Projects

Segment Numbers	Length (ft)	Length (miles)	Descriptions	Destinations	Notes	Cost with Standard Sigange	Cost of Shared Lane Sumbols	Number of Painted Shared Lane Symbols	Total Cost with Standard Signage and Shared Lane Symbols
11	7,009	1.33	Temple Heights Drive between Pine Ridge Road and North Avenue	Sprinter line, Temple Heights Elementary, residential		$4,600	$2,100	28	$6,700
12	7,205	1.36	Thunder Road/Lewis Road/Cedar Road between College Boulevard and Vista Way	John Landes Recreation Center, Childrens Hospital, residential	Thunder Road is a heavily travelled road parallel to College Blvd access primarily residential and some commerical offices. Lots of stop signs along this stretch. Some stop signs can be placed on the incoming streets to allow bicycles a continuous route along Thunder Road.	$4,800	$2,200	29	$6,900
13	3,936	0.75	Oleander Drive/Gardenia Street/Adams Street between College Boulevard and Frazee Road	Cesar Chavez Middle School, Mance Buchanon Park, San Luis Rey River Trail, residential		$2,600	$1,200	16	$3,800
14	2,776	0.53	Fireside Street between Los Arbolitos Blvd and Mission Avenue	Residential	Planned Class 2 but roadway configurations and on-street parking won't allow bike lanes	$1,800	$830	11	$2,700
15	5,753	1.09	Barnard Drive around Mira Costa College	Mira Costa College		$3,800	$1,700	23	$5,500
16	4,454	0.84	Horne Street between Surfrider Way and Grant Street	Oceanside High School, residential		$3,000	$1,300	18	$4,300
17	6,491	1.23	Willow Avenue/Carey Road/Foster Street/Grace Street/Dixie Street/Barnes Street/Maxson St/Country Club Ln between Jefferson Middle School and Mission Avenue	Jefferson Middle School, Burgener Academy, Challenges Community Day, Oceanside Unified School District office, Senior Citizens Center, Victory Christian School, School of Business and Technology and a Park and Ride		$4,300	$1,900	26	$6,300
18	4,169	0.79	Gold Drive/Barry Street/Leon Street between Vandergrift Boulevard and North River Road	Melba Bishop Recreation Center, Del Rio Elementary, residential, commercial		$2,800	$1,300	17	$4,000
19	4,191	0.79	Mission Gate Drive between Via Rancho Road and Mission Avenue	Residential		$2,800	$1,300	17	$4,000
20	16,566	3.1	Sleeping Indian Road between North River Road and City limit	Connects North River Road to northern City limits	Rural Residential, Fallbrook, Agriculture	$11,000	$5,000	66	$16,000
21	7,861	1.49	Loretta Street/Langford Street/Laurel Street/San Diego Street between SR-76 and Canyon Drive	SR-76, Joe Balderrama Recreation Center, Laurel Elementary, residential, commerical		$5,200	$2,400	31	$7,600
22	14,313	2.71	Silver Bluff Drive/Masters Drive/Corona Drive/Alamosa Park Drive/Rio Plata Drive/Robinwood Drive/Muirwood Drive/Summerhill Drive/Sagewood Drive between College Boulevard and Mesa Drive	Alamosa Park Elementary, Roosevelt Middle School, Alamosa Park, residential		$9,500	$4,300	57	$14,000
23	12,301	2.33	Cameo Drive/Brandeis Drive/Kelton Drive/Marvin Street/Sherbourne Road/Thunder Road between Rancho Del Oro and College Boulevard	McAuliffe Elementary, Sherbourne Park	Brandeis Drive is a steep climb from Cameo Drive	$8,200	$3,700	49	$12,000

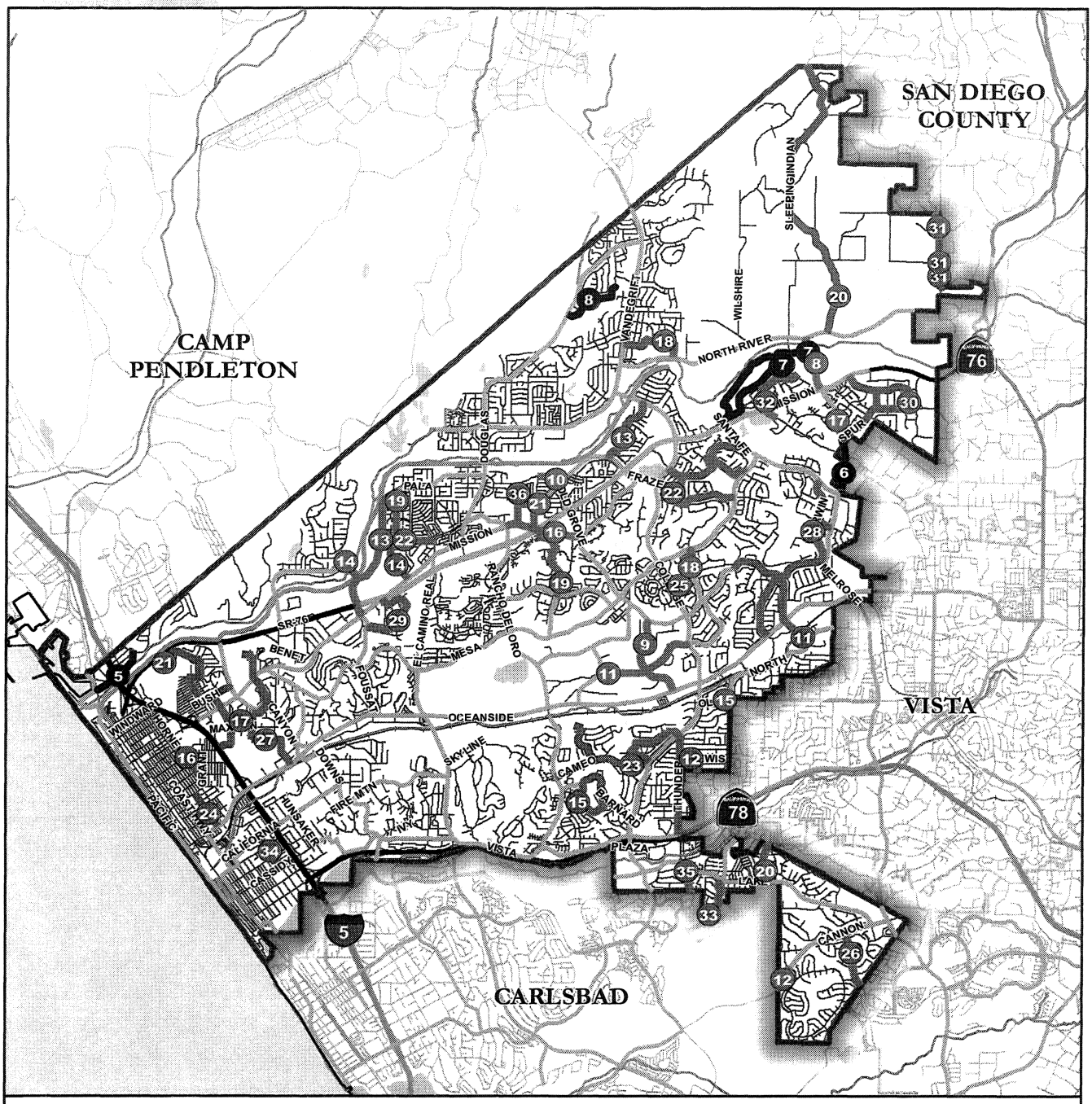
*Cost have been rounded

Second Priority Class 3 cont.

Second Priority Class 3 Bike Route Projects

Segment Numbers	Length (ft)	Length (miles)	Descriptions	Destinations	Notes	Cost with Standard Sigange	Cost of Shared Lane Sumbols	Number of Painted Shared Lane Symbols	Total Cost with Standard Signage and Shared Lane Symbols
24	2,190	0.41	South Ditmar Street between Wisconsin Avenue and Oceanside Boulevard	Ditmar Elementary,Mary Star of the Sea Elementary, residential		$1,500	$660	9	$2,100
25	1,389	0.26	Avenida Empresa between College Boulevard and Avenida De La Plata	Empresa Elementary, residential		$920	$420	6	$1,300
26	2,957	0.56	Shadowridge Drive between Cannon Road and City of Vista	City of Vista, residential		$2,000	$890	12	$2,800
27	4,800	0.91	Maxson Street/Grace Street and Greenbrier Drive between Country Club Lane and Oceanside Boulevard	Senior Citizens Center, Victory Christian School and a Park and Ride		$3,200	$1,400	19	$4,600
28	11,883	2.25	Darwin Drive and Peacock Boulevard between Oceanside Boulevard and North Santa Fe Avenue. Sagewood Drive	Residential		$7,900	$3,600	48	$11,000
29	4,840	0.92	Frontier Drive/Hacienda Drive/Flaminog Drive/Las Vegas Drive between Mission Avenue and Foussat Road	Park and Ride, Pacific View Charter, residential		$3,200	$1,500	19	$4,700
30	9,728	1.84	Jeffries Ranch Road/Wagon Wheel Drive/Spur Avenue/Buckboard Drive/Del Mar Road between SR-76 and Melrose Drive	Mission Meadows Elementary, residential		$6,400	$2,900	39	$9,400
31	4,304	0.82	Via Puerta Del Sol between North River Road and Bonsall	Rural residential		$2,900	$1,300	17	$4,100
32	4,076	0.77	Cranberry Street and Guajome Lake Rd	Guajome Park		$2,700	$1,200	16	$3,900
33	1,968	0.4	Sky Haven Lane between Lake Boulevard and Azure Lado Drive	Connection from Lake Boulevard to Calaveras Lake trails	City of Carlsbad, Residential, Calaveras Lake	$1,300	$590	8	$1,900
34	2,012	0.38	Stewart St between California Street and Cassidy Street	Residential		$1,300	$600	8	$1,900
35	1,493	0.28	Mira Monte Drive between Lake Boulevard and city limit	Residential		$990	$450	6	$1,400
36	3,308	0.63	Academy Road/Private Rd/Via Santa Maria along Mission Avenue	Old Mission Montessori, O'Keefe Field, Tri_City Inline Park, North County Alano Club, San Luis Rey homes	If Frazee Rd will connect in the future, this route will allow access to the school from adjacent neighborhoods. Via Santa Maria is primarily a narrow road to access the Montessori from Mission Avenue.	$2,200	$990	13	$3,200
Totals	**151,973**	**28.78**				**$36,510**	**$16,500**	**608**	**$52,300**

*Cost have been rounded



Existing Bicycle Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Second Priority Facilities

- Class 1: Bike Path
- Class 2: Bike Lane
- Class 3: Bike Route

Figure 5-3 Second Priority Projects

0 0.5 1
Miles

Data Source: KTU+A (2008)

5.5 Bikeway Funding Sources

Federal, State and local government agencies invest billions of dollars every year in the nation's transportation system. Only a fraction of that funding is used in development projects, policy development and planning to improve conditions for cyclists. Even though appropriate funds are limited, they are available, but desirable projects sometimes go unfunded because communities may be unaware of a fund's existence, or may apply for the wrong type of grants. Also, the competition between municipalities for the available bikeway funding is often fierce.

Whenever Federal funds are used for bicycle projects, a certain level of State and/or local matching funding is generally required. State funds are often available to local governments on the similar terms. Almost every implemented bicycle program and facility in the United States has had more than one funding source and it often takes a good deal of coordination and opportunism to pull the various sources together.

According to the FHWA's publication, An Analysis of Current Funding Mechanisms for Bicycle and Pedestrian Programs at the Federal, State and Local Levels, where successful local bike facility programs exist, there is usually a full-time bicycle coordinator with extensive understanding of funding sources. Cities such as Seattle, Washington, Portland, Oregon and San Diego are prime examples. Bicycle coordinators are often in a position to develop a competitive project and detailed proposal that can be used to improve conditions for cyclists within their jurisdictions. Much of the following information on Federal and State funding sources was derived from the previously mentioned FHWA publication.

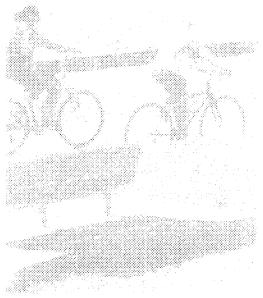
5.5.1 Federal Sources

U.S. Department of Transportation TEA-21 (Transportation Equity Act) Enhancement Funds

In 1991, Congress re-authorized the collection and distribution of the Federal gasoline tax and related transportation spending programs. The legislation, the Intermodal Surface Transportation Enhancement Act (ISTEA), was seen as particularly significant because the focus of 30 years of Federal transportation investment, the Interstate Highway System, was nearing completion. The legislation provided the opportunity to rethink transportation priorities and philosophies. This act was re-authorized in 1997 as the Transportation Equity Act (TEA-21), and again in 2005.

TEA-21 funding is currently managed through State and regional agencies, in this case the San Diego Association of Governments (SANDAG). Most, but not all, of the funding programs are oriented toward transportation versus recreation, with the emphasis on reducing auto trips and providing intermodal connections. Funding criteria include completion and adoption of a bicycle master plan, quantification of the costs and benefits of the system (including saved vehicle trips, reduced air pollution), proof of public involvement and support, NEPA compliance and the commitment of local resources. In most cases, TEA-21 provides matching grants of 80 to 90 percent. The amount of money available through TEA-21 is substantial (over $155 billion from 1992-97), but there is always strong competition to obtain those funds.

Federal funding through the TEA-21 program provides the bulk of outside funding. TEA-21 is comprised of two major programs, Surface Transportation Program (STP) and Congestion Management and Air Quality Improvement (CMAQ), along with other programs such as the National Recreational Trails Fund, Section 402 (Safety) funds, Scenic Byways funds and Federal Lands Highways funds, though municipalities are unlikely to be eligible for funding from all of these sources. Among the new concepts in the original legislation were intermodalism, transportation efficiency, funding flexibility and planning, all of which had direct benefits for cycling. The legislation also created a wide range of funding opportunities for bicycle-related activities, including the following that may represent opportunities for the City of Imperial Beach:



Surface Transportation Program (STP)

Section 1007 (a)(I)(b)(3) allows states to spend their allocation of Surface Transportation Program funds on a range of activities similar to those of the NHS. Bicycle facilities are specifically listed as eligible items. STP Funds can also be used for "non-construction bicycle projects related to safe bicycle use." Section 1007 (b)(2)(C)(c) created a new category of transportation enhancement activities (TEA) on which States were required to spend at least 10 percent of their Surface Transportation Program funds. TEAs are very broadly defined as:

> "...with respect to any project or the area to be served by the project, provision of facilities for pedestrians and cyclists, acquisition of scenic easements and scenic or historic sites, scenic or historic highway programs, landscaping and other scenic beautification, historic preservation, rehabilitation and operation of historic transportation buildings, structures or facilities including historic railroad facilities and canals, preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails), control and removal of outdoor advertising, archaeological planning and research and mitigation of water pollution due to highway runoff."

Surface Transportation Program funds are allocated to the California Department of Transportation (Caltrans) and 75 percent of STP funds are programmed by regional agencies such as the San Diego Association of Governments (SANDAG) under current state law. The Federal government does not allocate funds to specific projects. Therefore, for a bicycle project to be funded, it must appear on the list of potential projects under consideration at the State, regional, or City level, whichever is appropriate.

Local Planning

Section 1024 (a) requires each metropolitan area (with a population greater than 200,000) to develop an annual or biannual Transportation Improvement Program (TIP) that "shall provide for the development of transportation facilities (including pedestrian walkways and bicycle transportation facilities) which will function as an intermodal transportation system."

These TIPs must be based on available funding for projects in the program and they must be coordinated with transportation control measures to be implemented in accordance with Clean Air Act provisions. Final project selection rests with the California Transportation Commission (CTC), with technical input from Caltrans.

State Planning

Two sections of the Act explicitly require the State to develop a TIP to "consider strategies for incorporating bicycle transportation facilities and pedestrian walkways in projects, throughout the State," (Section 1025 (c)(3)), and to "develop a long-range plan for bicycle transportation facilities and pedestrian walkways for appropriate areas of the State, which shall be incorporated into the long-range transportation plan," (Section 1025 (e)). These provisions are important on a municipal level because they are crucial for getting incidental bicycle projects funded. The intent behind these sections is to ensure that if bicycle facilities are identified in a TIP or long-range plan as being necessary in a corridor and construction or reconstruction work in those corridors is planned, then the relevant bicycle improvements called for in the planning must be included and implemented. Opportunities for incorporating bicycle projects are not limited to large transportation projects and not even to actual construction projects. Independent bicycle and pedestrian projects, such as trails away from highway corridors and non-construction projects, such as mapping, also need to be incorporated into State and City planning documents if they are to be funded.

Section 1033 states that the Federal share under TEA-21 of bicycle transportation facilities is to be 80 percent. The remaining 20 percent of the funds must be matched by the State or local government agency implementing the project. The section also states that, to be funded, a bicycle transportation facility must be principally for transportation rather than recreation purposes. This has been defined by the FHWA to mean:

"Where Federal-aid highway funds are used, these projects should serve a transportation function. A circular recreation path, for example, would not be eligible. However, any type of facility which does serve a valid transportation need while also fulfilling recreation purposes would be eligible." The section goes on to describe a "bicycle transportation facility" as: "new or improved lanes, paths or shoulders for the use of cyclists, traffic control devices, shelters and parking facilities for cyclists."

Congestion Mitigation and Air Quality Program (CMAQ)

Section 1008 is referred to as the Congestion Mitigation and Air Quality Program (CMAQ). This part of the legislation is intended to fund programs and projects likely to contribute to the attainment of national ambient air quality standards under the 1990 Clean Air Act Amendments. Five areas of eligibility have been defined: Transportation activities in an approved State Implementation Plan (SIP) developed under the Clean Air Act Transportation Control Measures listed in Section 108 (b)(1)(A) of the Clean Air Act, which include:

(ix) Programs to limit portions of roadway surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place;

(x) Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of cyclists in both public and private areas; and

(xv) Programs for new construction and major reconstruction of paths, tracks, or areas solely for the use by pedestrians or other non-motorized means of transportation, when economically feasible and in the public interest."

"Construction of bicycle and pedestrian facilities, non-construction projects related to safe bicycle use and State bicycle/pedestrian coordinator positions as established in the TEA- 21, for promoting and facilitating the increased use of non-motorized modes of transportation. This includes public education, promotional and safety programs for using such facilities."

To be funded under this program, projects and programs must come from a transportation plan (or State (STIP) or Regional (RTIP) Transportation Improvement Program) that conforms to the SIP and must be consistent with the conformity provisions of Section 176 of the Clean Air Act.

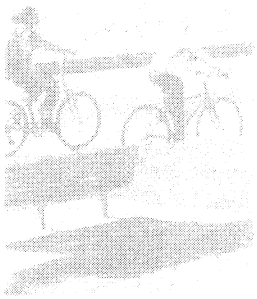
Section 402 (Safety) Funds

Section 402 funds address State and community highway safety grant programs. The priority status of safety programs for cyclists expedites the approval process for these safety efforts.

Symms National Recreational Trails Act

The Symms National Recreational Trails Act created a trust fund for the construction and maintenance of trails. At least 30 percent of the funds must be spent on trails for non-motorized users and at least 30 percent for trails for motorized users. The remainder is to be allocated to projects as determined by the State Recreational Trails Advisory Board of the California Department of Parks and Recreation, which the State must have to be eligible for the funds.

Federal Transit Act



Section 25 of the 1964 Urban Mass Transportation Act states that: "For the purposes of this Act a project to provide access for bicycles to mass transportation facilities, to provide shelters and parking facilities for bicycles in and around mass transportation facilities, or to install racks or other equipment for transporting bicycles on mass transportation vehicles shall be deemed to be a construction project eligible for assistance under sections 3, 9 and 18 of this Act." The Federal share for such projects is 90 percent and the remaining 10 percent must come from sources other than Federal funds or fare box revenues. Typical

funded projects have included bike lockers at transit stations and bike parking near major bus stops. To date, no projects to provide bikeways for quicker, safer or easier access to transit stations have been requested or funded.

Department of the Interior - Land and Water Conservation Fund (LWCF)
The U.S. Recreation and Heritage Conservation Service and the State Department of Park and Recreation administer this funding source. Any project for which LWCF funds are desired must meet two specific criteria. The first is that projects acquired or developed under the program must be primarily for recreational use and not transportation purposes and the second is that the lead agency must guarantee to maintain the facility in perpetuity for public recreation. The application will be considered using criteria such as priority status within the State Comprehensive Outdoor Recreation Plan (SCORP). State Department of Park and Recreation will select which projects to submit to the National Park Service (NPS) for approval. Final approval is based on the amount of funds available that year, which is determined by a population-based formula. Trails are the most commonly approved project.

National Recreational Trail Fund
This funding source is intended to pay for a variety of recreational trails programs to benefit cyclists, pedestrians and other non-motorized users. Projects must be consistent with the State Comprehensive Outdoor Recreation Plan required by the Land and Water Conservation Act.

5.5.2 State Sources

Streets and Highways Code – Bicycle Transportation Account (BTA)
The Bicycle Transportation Account (BTA) funds non-motorized facilities and access to cities and counties that have adopted bikeway master plans. Section 2106 (b) of the Streets and Highways Code transfers funds annually to the BTA from the revenue derived from the excise tax on motor vehicle fuel. The Caltrans Office of Bicycle Facilities administers the BTA. It is locally administered through SANDAG to counties and cities. Approximately $8.2 million is available annually to projects in San Diego County. For a project to be funded from the BTA, the project shall:

i) Be approximately parallel to a State, county, or city roadways, where the separation of bicycle traffic from motor vehicle traffic will increase the traffic capacity of the roadway; and

ii) Serve the functional needs of commuting cyclists; and

iii) Include but not be limited to:

- New bikeways serving major transportation corridors;
- New bikeways removing travel barriers to potential bicycle commuters;
- Secure bicycle parking at employment centers, park and ride lots and transit terminals;
- Bicycle-carrying facilities on public transit vehicles;
- Installation of traffic control devices to improve the safety and efficiency of bicycle travel;
- Elimination of hazardous conditions on existing bikeways serving a utility purpose;
- Planning; and
- Safety and education

Maintenance is specifically excluded from funding and allocation takes into consideration the relative cost effectiveness of the proposed project.

State Highway Account
Section 157.4 of the Streets and Highways Code requires Caltrans to set aside $360,000 for the construction of non-motorized facilities that will be used in conjunction with the State

highway system. The Office of Bicycle Facilities also administers the State Highway Account fund. Funding is divided into different project categories. Minor B projects (less than $42,000) are funded by a lump-sum allocation by the CTC and are used at the discretion of each Caltrans District office. Minor A projects (estimated to cost between $42,000 and $300,000) must be approved by the CTC. Major projects (more than $300,000) must be included in the State Transportation Improvement Program and approved by the CTC. Funded projects have included fencing and bicycle warning signs related to rail corridors.

Transportation Development Act Article III (Senate Bill 821)
Transportation Development Act Article III funds are State block grants awarded annually to local jurisdictions for bicycle and pedestrian projects in California. The funds originate from the State retail sales tax and are distributed through the Congestion Management Agency to local jurisdictions based generally of population. Examples of expenditures have included construction of bicycle facilities and printing of bicycle safety posters on the back of city buses.

5.5.3 Other State Bicycle Project Funding Sources

Governor's Energy Office (Oil Overcharge Funds)
The Federal government forced oil companies to repay the excess profits many of them made when they violated price regulations enacted in response to the energy crisis of the early 1970's. Few states have taken advantage of this fund, but some have received grants for bike coordinators and bicycle facilities. The types of projects eligible for funding vary by state, as does the level of allocation available.

Safe Routes to School Program (SR2S)
The Safe Routes to School Program funds non-motorized facilities in conjunction with improving access to schools through the Caltrans Local Assistance Division.

5.5.4 Local Sources

TransNet Sales Tax Funds
San Diego County voters passed a local tax ordinance authorizing the creation of the TransNet Sales Tax, imposing a 1/2 cent "transaction and use tax" solely to fund transportation improvements. About one million dollars are allocated annually for improved bicycle routes throughout the region. The ordinance describes bicycle facilities and requirements for facilities as:

"All purposes necessary and convenient to the design, right-of-way acquisition and construction of facilities intended for the use of bicycles. Bicycle facilities shall also mean facilities and programs that help to encourage the use of bicycles, such as secure bicycle parking facilities, bicycle promotion programs and bicycle safety education programs."

"All new highway projects funded with revenues as provided in this measure, which are also identified as bikeway facilities in the Regional Transportation Plan (RTP), shall be required to include provision for bicycle use."

Proposition A
This is a funding source administered by SANDAG with an annual availability of approximately $1 million per year.

Assembly Bill 2766/434
This bill funds air pollution reduction projects related to alternate modes of transportation. The Air Pollution Control Board (APCB) administers this fund. Approximately $3 million is available annually.

RideLink
This program is operated by SANDAG and covers a variety of transportation management

activities including projects such as bicycle lockers and security devices. These will be provided, installed and maintained for public agencies at no cost to the requesting agency. RideLink also offers a bicycle locker loan program to private sector entities.

Developer Impact Fees

As a condition for development approval, municipalities can require developers to provide certain infrastructure improvements, which can include bikeway projects. These projects have commonly provided Class 2 facilities for portions of on-street, previously planned routes. They can also be used to provide bicycle parking or shower and locker facilities. The type of facility that should be required to be built by developers should reflect the greatest need for the particular project and its local area. Legal challenges to these types of fees have resulted in the requirement to illustrate a clear nexus between the particular project and the mandated improvement and cost.

New Construction

Future road widening and construction projects are one means of providing on-street bicycle facilities. To ensure that roadway construction projects provide bike lanes where needed, it is important that the review process includes input pertaining to consistency with the proposed system. Future development in the City of Imperial Beach will contribute only if the projects are conditioned.

Restoration

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

Other Sources

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

5.5.5 Most Likely Sources

According to City of Imperial Beach sources, the most likely local sources of bikeway funding are the following:

1) TDA/CIP (Transportation Development Act, Capital Improvement Projects)
2) TIF (Traffic Impact Fee Fund)
3) City of Imperial Beach General Fund
4) Developer Impact Fees
5) BTA (Bicycle Transportation Account)
6) APCB (Air Pollution Control Board)

These facility guidelines are intended to guide development of all types of bikeway facilities. The first section considers the necessary planning aspects of bikeway system design in general. The following section discusses general physical design guidelines. Subsequent sections provide physical design information for specific classes of bikeway facilities.

5.6 Bikeway Planning

Successfully implementing a bikeway system involves careful planning that considers a number of issues, including setting up appropriate mechanisms to take advantage of bikeway opportunities as they become available. Author and bicycle planning expert Susan Pinsof has perhaps described the process most succinctly:

"A comprehensive, affordable approach to bicycle planning involves maximizing the usefulness of existing infrastructure by improving the safety of shared roadway space; using opportunities, such as available open space corridors for trails; creating more "bicycle-friendly" communities through planning, design and regulation; and addressing the need for bicycle safety education and encouragement."

5.6.1 Local Emphasis

Cycling is primarily a local activity since most trips do not exceed five miles. Experienced cyclists routinely ride further than this and their cross-community travel should be accommodated. However, if it is a community goal to make localized cycling a viable option for personal transportation, then cyclist mobility must be improved and enhanced throughout the community, especially to important local destinations. Even though State or Federal policies may influence or even dictate some design and implementation decisions, it is local decisions that will most significantly affect the potential for cycling within a community.

5.6.2 Master Plan Process

The basis for a bicycle-friendly community can be established by instituting appropriate policies through the development and adoption of this bicycle master plan. A program of physical improvements and workable implementation strategies that reflects local needs was developed as part of this master plan. A bicycle master plan will be of little value if it is not part of an active and ongoing planning process that continually seeks to integrate cycling considerations into all areas of local planning.

Within this master plan, facility design guidelines have been tailored to local conditions, but are also consistent with national guidelines, such as the AASHTO Guide to Development of Bicycle Facilities. State guidelines are also referenced, specifically, Caltrans Highway Design Manual, Chapter 1000, Bikeway Planning and Design and the Caltrans Traffic Manual. Elements of these guidelines without relevance to the region have been excluded.

5.6.3 "Institutionalizing" Bicycle Planning

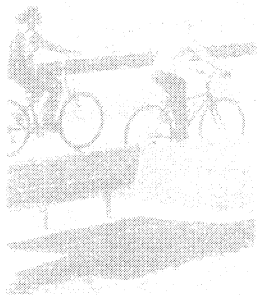
Achieving implementation of this master plan will be greatly expedited by "institutionalizing" bicycle planning, a concept first developed by Peter Lagerway of the city of Seattle, Washington as part of his efforts as the city's pedestrian and bicycle coordinator. The term refers to coordinating local planning and regulatory functions in the development of a program of improvements. The three elements needed to institutionalize bicycle planning on a local level are a bicycle advisory committee, a bicycle coordinator and committed public officials.

1. Bicycle Advisory Committee

Public involvement can be promoted through the formation of a bicycle advisory committee as a new city committee, or as a subcommittee of an appropriate existing committee. Its primary benefit would be in providing an avenue for public participation and support.

2. Bicycle Coordinator

City government involvement can occur through the designation of a bicycle coordinator. For a city the size of Imperial Beach, this may be a part-time position or integrated with an existing position, but this does not diminish its importance. Since a truly comprehensive bicycle planning effort will involve many city departments including Public Works, Parks and Recreation, Planning and Traffic Engineering, as well as local school boards and the Sheriffs Department, the bicycle coordinator would be in a position to organize interdepartmental efforts and make certain that bicycle concerns are integrated into other city activities in the planning stages, as well as coordinated with adjacent communities and jurisdictions.



3. Public Officials

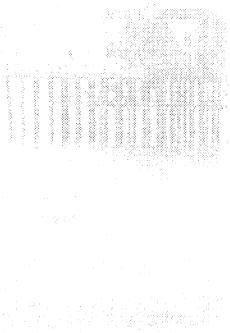
The third aspect of institutionalization of bicycle planning involves obtaining the commitment of public officials. Leadership for bicycle improvements may already come from public officials, but even if it does not, officials will be more likely to be supportive if they can be certain their constituency wants a more bicycle-friendly community.

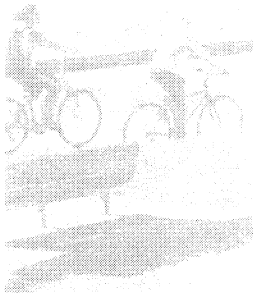
Figure 5-4 Bikeway Facility Funding Summary

Grant Source	Due Date	Agency	Annual Total	Match Required	Eligible Applicants	Eligible Bikeway Project Types: Dom	Eligible Bikeway Project Types: Rec	Eligible Bikeway Project Types: Safety	Remarks
State Sources									
State Highway Account (SHA): Bicycle Transportation Account (BTA)	Consult Local Assistance Office	Caltrans	$7,200,000/yr. state-wide	10% local match required	Jurisdictions with an adopted Bikeway Plan	X		X	Available for planning grants
Transportation Development Act (TDA) Section 99234	April 2, annually			none	Local agencies	X	X	X	2% of TDA total
AB 2766 Vehicle Registration Funds		Caltrans				X	X		Competitive program for projects that benefit air quality
Vehicle Registration Surcharge Fee (AB 434) RCF	July	APCB		none	Local agencies, transit operations, others	X	X	X	Competitive program for projects that benefit air quality
Vehicle Registration Surcharge Fee (AB 434) PMF	April	APCB	40% from grant source	none	Local jurisdictions	X	X	X	Funds distributed to county communities based on population
Developer Fees or Exactions	Ongoing	Cities	Project-specific	none		X	X	X	Mitigation required during land use approval process
State Gas Tax (local share)	Monthly allocation	Allocated by State Auditor-Controller		none	Local jurisdictions	X		X	Major Projects, >$500,000
Flexible Congestion Relief Program (FCRP)	Dec. STIP cycle	Caltrans	$200 million/yr. state-wide		Cities, counties, transit operations, Caltrans	X	X		Must be included in an adopted RTP, STIP, CMP or RTIP
State and Local Transportation Partnership Program (SLPP)	June 30	Caltrans	Est. $200 million/yr. state-wide	none	Cities, counties or assess. districts authorized to impose taxes/fees and construct public trans. facilities	X	X		Road projects with bike lanes are eligible
Caltrans Minor Capital Program	Ongoing after July 1	Caltrans	Discretionary (Est. $4 million/yr. for District 11)	none	State and local agencies for projects >$300,000	X			Projects must be on state highways; such as upgraded bike facilities
Environmental Enhancement and Mitigation Program (EEM)	Nov. 1 annually	State Resources Agency	$10 million/yr. state-wide	none required, but favored	Local, state, federal government and non-profit agencies	X	X		Projects that enhance or mitigate existing or future transportation projects
Petroleum Violation Escrow Account (PVEA)	March 1	Budget Act for Caltrans, or special legislation for allocation to local agencies	Varies	none	State and local jurisdictions	X	X		Projects must save energy, provide restitution to the public and be approved by CA Energy Commission and US DOE
Community Based Transportation Planning Demonstration Grant Program	November	Caltrans	$3 million annually	20% local match required	Local and state agencies, MPOs, RTPAs, private, non-profit and community organizations	X		X	Projects must have a transportation component or objective
Habitat Conservation Fund Grant Program (HCF)	October	CA Dept of Park and Recreation	$2 million	50% local match required	Cities, counties and eligible districts		X		Will only be available until July 1, 2000
Office of Traffic Safety Program (OTS)	January 31	Office of Traffic Safety	Varies	none	Local, state, federal government, school districts, fire departments, state colleges and universities, emergency service providers and non-profit agencies	X		X	Program objective is to reduce motor vehicle fatalities and injuries through a national highway safety program. Program to include: education, enforcement and engineering
Safe Routes to School Program (SR2S)	May	Subset of the Hazard Elimination Safety Program	$20 million annually	10% local match required	Cities and counties within California	X		X	Maximum grant shall not exceed $450,000 of federal funds per project
State Transportation Improvement Program (STIP)	Every 4 years	Regional Transportation Planning Agency	Varies	non	Cities, counties transit operators and Caltrans	X		X	Gives transportation regions more control over how state transportation funds are invested

Grant Source	Due Date	Agency	Annual Total	Match Required	Eligible Applicants	Eligible Bikeway Project Types			Remarks
						Com	Rec	Safety	
Federal Sources									
Land and Water Conservation Act of 1965	Dec.	State Parks and Recreation Department		50%			X		Funding subject to North/South split. Funds for outdoor recreation projects
TEA21 - Surface Transportation Program (STP)	June 1	Caltrans, FHWA		20% non-federal match	Federally certified jurisdictions				STP funds may be exchanged for local funds for non-federally certified local agencies. No match required if project improves safety
TEA21 - Tranportation Enhancement Activities (TEA)	STIP cycle	FHWA		20% non-federal match	Federally certified jurisdictions	X	X		Contact county
TEA21 - Bridge Replacement and Rehabilitation Program (BRP)	Jan/list of projects	Caltrans	$85 million/yr. state-wide	20%	Cities, counties, parks/recreation districts and air districts	X	X		Contact Caltrans Division of Structures, Office of Local Programs, Program Manager
TEA21 - National Highway System		Caltrans				X	X		Bike projects must provide a high degree of safety
TEA21 - Scenic Byways Program		Caltrans	$30 million/yr. state-wide		Local government agencies		X		Should apply first for TEA funds until TEA runs out
TEA21 - Public Lands Highway Program									
1. Forest Highway Program	Oct. 30	Caltrans	$15 million/yr. state-wide		Caltrans, local jurisdictions and federally funded programs (USFS, BLM)	X	X		For roads and bikeways leading to and serving National Forests
2. Discretionary Program	June 7	Caltrans	Varies - averages $7 million/yr. state-wide		Caltrans, local jurisdictions and federally funded programs (USFS, BLM)	X	X		For roads and bikeways leading to and serving National Forests
Congestion Mitigation and Air Quality Improvement Plan (CMAQ)	Annually to Multi-Year. Depends on MPO	Caltrans	$400 million/yr. state-wide	20% non-federal match	Cities, counties, transit operators, Caltrans, Metropolitan Planning Organizations, Non-Profit and private entities	X		X	The amount of CMAQ Funds depends on the state's populationshare and on the degree of air pollution
Regional Trails Program (RTP)	October	Dept of Parks and Recreation	$3 million annually	20% non-federal match	Local jurisdictions, state agencies and non-profit organizations		X	X	Funds are for both mototrized and non-motorized categories
Rivers, Trails and Conservation Assistance Program (RTCA)	August	National Park Service			Local jurisdictions, state agencies and citizen groups		X		Expenditures include bikeway plans, corridor studies and trails assistance

SHARE
THE
ROAD





6 Design Guidelines

These facility guidelines are intended to guide development of all bikeway facility types. The first section considers the necessary planning aspects of bikeway system design in general. The following section discusses general physical design guidelines. Subsequent sections provide physical design information for specific classes of bikeway facilities.

6.1 Bikeway Planning

Successfully implementing a bikeway system involves careful planning that considers a number of issues, including setting up appropriate mechanisms to take advantage of bikeway opportunities as they become available. Author and bicycle planning expert Susan Pinsof has perhaps described the process most succinctly:

"A comprehensive, affordable approach to bicycle planning involves maximizing the usefulness of existing infrastructure by improving the safety of shared roadway space; using opportunities, such as available open space corridors for trails; creating more 'bicycle-friendly' communities through planning, design and regulation; and addressing the need for bicycle safety education and encouragement."

6.1.1 Local Emphasis

Cycling is primarily a local activity since most trips do not exceed five miles. Experienced cyclists routinely ride further than this and their cross-community travel should be accommodated. However, if it is a community goal to make localized cycling a viable option for personal transportation, then cyclist mobility must be improved and enhanced throughout the community, especially to important local destinations. Even though State or Federal policies may influence or even dictate some design and implementation decisions, it is local decisions that will most significantly affect the potential for cycling within a community.

6.1.2 Master Plan Process

The basis for a bicycle-friendly community can be established by instituting appropriate policies through the development and adoption of this bicycle master plan. A program of physical improvements and workable implementation strategies that reflects local needs was developed as part of this master plan. A bicycle master plan will be of little value if it is not part of an active and ongoing planning process that continually seeks to integrate cycling considerations into all areas of local planning.

Within this master plan, facility design guidelines have been tailored to local conditions, but are also consistent with national guidelines, such as the AASHTO Guide to Development of Bicycle Facilities. State guidelines are also referenced, specifically, Caltrans *Highway Design Manual*, Chapter 1000, Bikeway Planning and Design and the Caltrans Traffic Manual. Elements of these guidelines without relevance to the region have been excluded.

6.1.3 "Institutionalizing" Bicycle Planning

Achieving implementation of this master plan will be greatly expedited by "institutionalizing" bicycle planning, a concept first developed by Peter Lagerway of the city of Seattle, Washington as part of his efforts as the city's pedestrian and bicycle coordinator. The term refers to coordinating local planning and regulatory functions in the development of a program of improvements. The three elements needed to institutionalize bicycle planning on a local level are a bicycle advisory committee, a bicycle coordinator and committed public officials.

Bicycle Coordinator

City government involvement can occur through the designation of a bicycle coordinator. For a city the size of Oceanside, this may be a full-time position or integrated with an existing position, but this does not diminish its importance. Since a truly comprehensive bicycle planning effort will involve many city departments including Public Works, Parks and Recreation, Planning and Traffic Engineering, as well as local school boards and the Sheriffs

Department, the bicycle coordinator would be in a position to organize interdepartmental efforts and make certain that bicycle concerns are integrated into other city activities in the planning stages, as well as coordinated with adjacent communities and jurisdictions.

Public Officials

The third aspect of institutionalization of bicycle planning involves obtaining the commitment of public officials. Leadership for bicycle improvements may already come from public officials, but even if it does not, officials will be more likely to be supportive if they can be certain their constituency wants a more bicycle-friendly community.

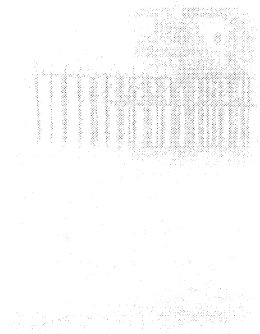
6.1.4 Primary Planning Considerations

The safety, efficiency and enjoyment of the bike facility by expected users should be the primary considerations employed in the planning of new bicycle facilities. More specifically, such considerations should include the following:

- Direct and convenient alignment to serve trip origins and destinations;
- Access to and from existing and planned bicycle facilities;
- Avoiding abrupt facility discontinuity;
- Avoiding steep grades whenever possible;
- Adequate lighting and sight lines;
- Convenient bicycle parking at destinations; and
- Adequate commitment to maintenance.

6.1.5 Integration with Other City Plans and Programs

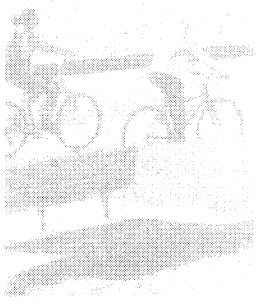
Bikeway facility planning requires a high level of coordination because it is directly affected by the planning decisions of other City departments, as well as those of adjacent communities, the county, regional and state agencies. Land use, zoning, street design, open space and park planning all affect how bicycle-friendly a community can be. For examples, land use patterns affect cycling by determining the locations of trip origins and destinations by such means as creating areas of employment and housing densities sufficient to sustain bicycle facilities, or by providing a balance of housing and jobs by encouraging multi-use development. Access or bicycle parking facilities can often be included in developments at a low cost. Also, the provision of better access and connections between developments for cyclists and pedestrians may be more easily provided if the need is understood and articulated as early as possible in the planning process.



Effective bicycle planning requires review of regional transportation plans, local street plans, park and open space plans and even site plan review. Transportation plans provide opportunities for low cost improvements to be designed into subsequent projects. Local street plans provide opportunities to implement changes that make streets more conducive to cycling using techniques such as traffic calming to reduce motor vehicle speeds. Park and open space planning may provide opportunities to acquire greenways and to build multi-use trails. Site plan review provides opportunities to ensure that project design accommodates cyclists through the provision of improvements such as access or parking facilities and that the project's vehicular traffic does not decrease the safety of cyclists of adjacent facilities.

6.1.6 Education and Encouragement

Education and encouragement of cycling are important elements of any bicycle planning effort and can occur through instructional venues such as school curricula and through the efforts of large employer-based transportation programs. There is no shortage of educational materials available through a number of private and government organizations such as the League of American Bicyclists. The dissemination of meaningful information can also be augmented by the participation of local businesses such as bike shops, especially since they have a vested interest in promoting safe cycling in Oceanside. Education and encouragement rarely receive the attention they deserve even when included in bikeway master plans and this is where a bicycle coordinator can be of help in developing appropriate programs.



The following are a few ways to develop education and encrouagement throughout the City.

Education:

1. Expand motorist education efforts. Install additional "Share the Road" signage throughout the City especially on roads with high ADTS and speed limits. Include the "Share the Road" message in local driver's education classes. Improve road network signage.

2. Get bicycling motorist education messages added to routine local activities. These could be included in tax renewal, drivers' manuals testing, or inserts with utility bills.

3. Expand the Safe Routes to School program and encourage all schools to get involved.

4. Improve the reach of bicycle safety campaigns.
This can include PSAs through KOCT and the Oceanside Magazine.

Encouragement

1. Expand encouragement efforts during Bike Month.
Have the Mayor and/or the City Council proclaim May as Bike Month and expand Bike to Work Week events. Have local bike shops and businesses donate time and money to man stations throughout the City to promote bicycling, health awareness and their businesses.

Ribbon cutting ceremony for the opening of the San Luis Rey River Trail extension

2. Develop a series of short (2-5 mi.) loops rides around Oceanside. Provide way-finding signage and integrate these rides into local bike map. Have the City of local bicycle club promote a race for amateurs and professionals and include children's races to encourage bicycling. Use these events to conduct bicycle rodeos to promote safe and fun bicycling. Proceeds from the event can be used to improve and maintain bicycle facilities throughout the City.

3. Improve bicycle route wayfinding markers.

4. Arrange community celebrations and/or rides each time a new bicycling related project is completed. Show off the City's good efforts and introduce new users to the improvment.

Enforcement

Address whether or not the law enforcement community has a liaison with the cycling community, if there are bicycle divisions of the law enforcement or public safety communities, if the community uses targeted enforcement to encourage cyclists and motorists to share the road safely, and the existence of bicycling related laws such as those requiring helmet or the use of sidepaths.

Encourage the Police Department to use targeted enforcement to encourage motorists and cyclists to share the road. This could be in the form of a brochure or tip card explaining each user's rights and responsibilities.

6.1.7 Regulating Land Use and Community Design to Benefit Cycling

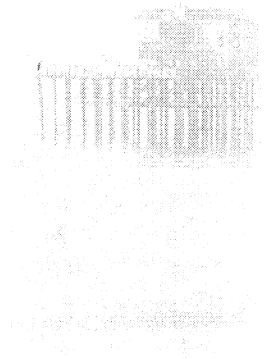
Land use and design options are largely determined by regulatory functions that, in turn, help to define community character and functionality. These regulatory functions such as subdivision regulations, zoning requirements and developer exactions are also often used to set requirements for amenities in new development projects. These same regulations can be used to help define development patterns more conducive to cycling such as in-

corporating more mixed use, higher densities and connections between communities and land uses. Street patterns and hierarchy can greatly affect average daily (motor vehicle) trips (ADTs), connectivity and motor vehicle speeds, which in turn positively or negatively affects cycling. Street design can be modified to discourage high motor vehicle speeds and to provide width for a bike lane. Linear open space can become land for greenway routes that benefit all non-motorized users, not just cyclists.

Though prioritization of bikeway projects is defined by State and local decisions, it is Federal funding and policies that currently encourage the use of transportation funds for bicycle and pedestrian projects. However, Federal funding cannot be counted upon as a reliable source for the foreseeable future since it depends on the political nature of legislative action. Bicycle planning cannot sustain itself on the occasional Federal grant. Future local implementation will more likely depend on instituting bicycle improvements as part of infrastructural projects, which is when they are most cost-effective.

Similarly, the most economical way to include bicycle facilities in private development is through initial project planning and design, not as an afterthought. Ordinances can be written that bikeway systems be included as part of new developments. An effort should be made to show developers that such requirements are worthwhile because they create well established marketing advantages gained from providing pedestrian and bicycle amenities. Ordinances can also require bicycle amenities such as bicycle parking, showers and lockers at employment sites. In all cases, a bicycle master plan is important for establishing priorities for such public/private projects.

Review of developments for transportation impacts should address how on-site bicycle facilities are planned. Bicycle storage racks should be provided at commercial facilities at locations convenient to building entrances and covered from the elements. This is especially important at retail and service establishments. At employment sites, secure bicycle racks and/or lockers should be provided. For outdoor parking, lockers are preferred because they completely secure the bicycle from theft of the entire bicycle or its parts and are weatherproof.

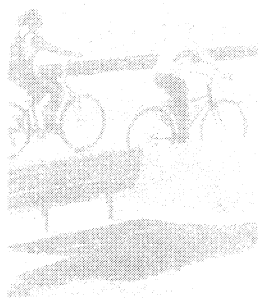


Requiring developments near commuter rail stations to provide access pathways to these transit centers as part of urban in-fill may improve multi-modal connections for pedestrians and cyclists alike. Other developers should contribute to bicycle master plan implementation projects in newly developing areas. Park land dedication or fees in lieu of dedication is another possible component of strategies to acquire local trail and bicycle path rights-of-way.

6.1.8 Bicycle Parking Facilities

The selection and placement of bicycle racks is an important issue because the lack of secure parking keeps many people from using their bikes for basic transportation. Leaving a bicycle unattended, even for short periods, can easily result in damage or theft. Not being able to find a bike rack or finding one that does not work or is not conveniently located is a frustrating experience.

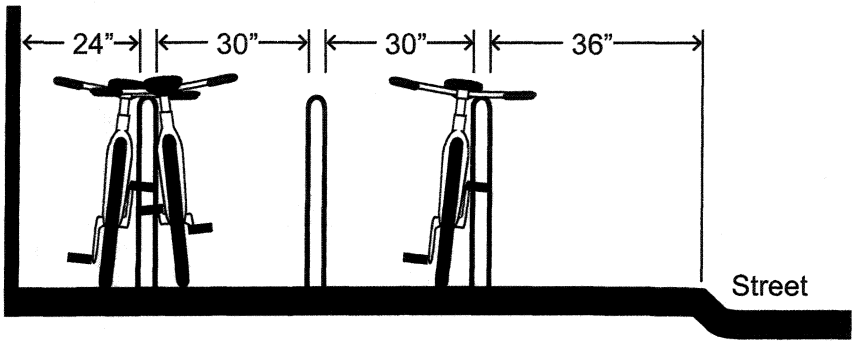
Whenever possible, the racks should be placed within 50 feet of building entrances where cyclists would naturally transition to pedestrian mode. The rack placement would ideally allow for visual monitoring by people within the building and/or people entering the building. The placement of the racks should minimize conflicts with both pedestrians and motorized traffic. All bicycle parking provided should be on paving, and located a minimum of two feet from a parallel wall, and four feet from a perpendicular wall (as measured to the closest center of the rack).

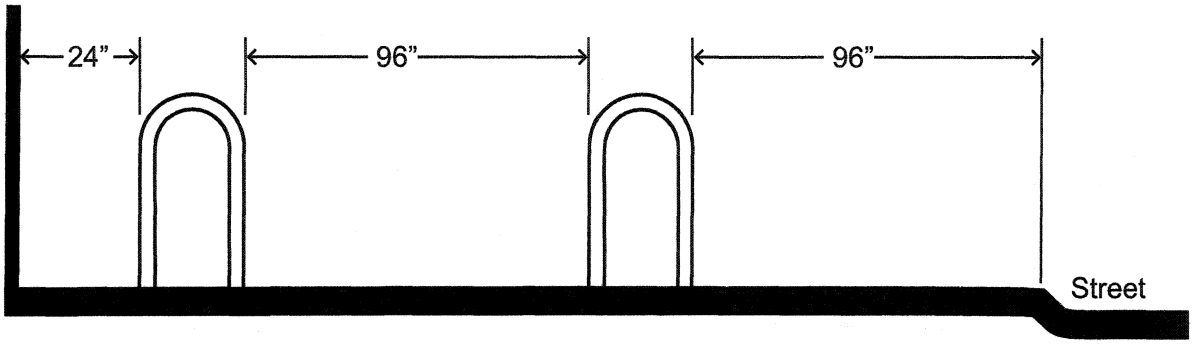


Like most American municipalities, no real facility inventory is available for Oceanside. However, there are bicycle parking facilities at the larger retail centers, Community Centers and some parks and other City facilities as well as the bikelockers at the Sprinter Stations, City Hall and the Oceanside Transit Center.

Oceanside could implement a minimum bicycle parking ordinance like that of the City of Encinitas (EMC 30.54.030.C) that defines bicycle parking facilities as "...stationary racks or devices designed to secure the frame and wheel of the bicycle." The ordinance lists the following provisions:

- Buildings housing administrative/professional office space, shopping centers and other commercial uses of less than 20,000 square feet of floor area must provide a minimum of three bicycle parking spaces. Facilities with more than 20,000 square feet must supply a minimum of five spaces.
- Shopping centers with over 50,000 square feet of gross floor area must supply one bicycle parking space for every 33 required automobile spaces.
- Restaurants of less than 6,000 square feet of floor area must provide two spaces and restaurants with more than 6,000 square feet must provide five spaces.





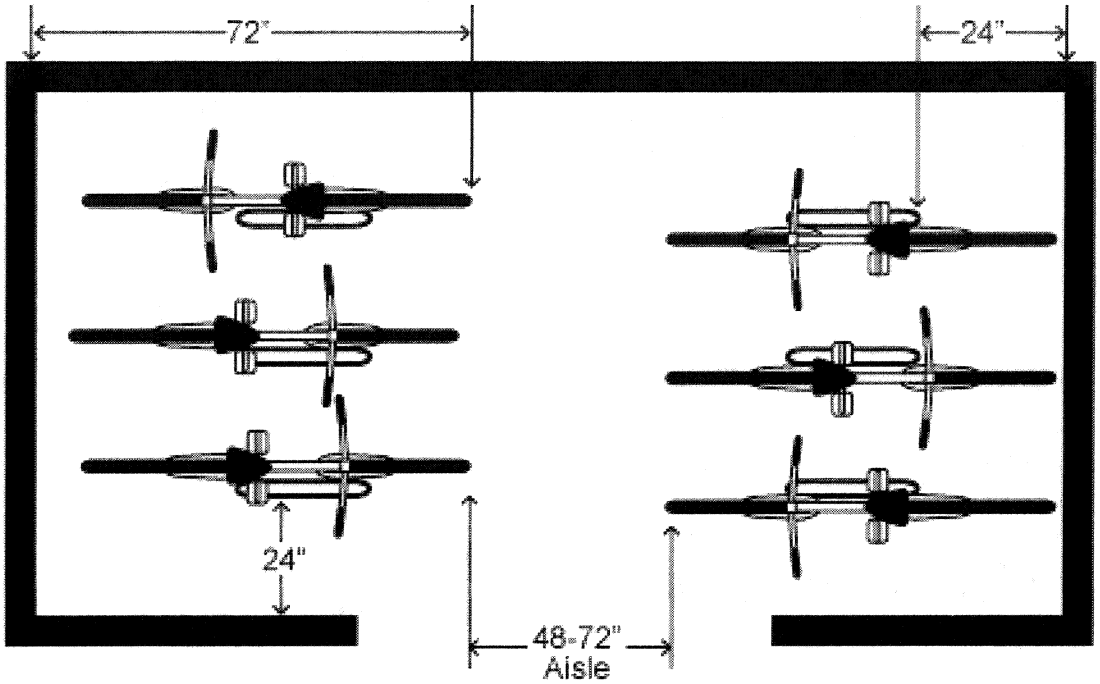
- Recreation facilities must provide one bicycle space per 33 required automobile parking space.
- Hospitals and churches must provide eight bicycle spaces.

The City should continue to encourage the use of alternate forms of transportation by also requiring the provision of shower facilities for employers with greater than a specified number of employees.

To help achieve parity with drivers, the City could codify by ordinance, or develop a pro-

gram to provide bike racks in existing commercial areas, and in new or existing multi-family development designed without private garages. These programs should include bike rack design and installation standards such as those in the following section.

The following paragraphs and graphics focus on outdoor installations using racks intended to accommodate conventional, upright, single-rider bicycles and the use a solid, U-shaped lock, or a cable lock, or both.



Rack Element
The rack element is the part of the bike rack that supports one bicycle. It should support the bicycle by its frame in two places, prevent the bicycle wheel from tipping over, allow the frame and one or both wheels to be secured and support bicycles with unconventional frames.

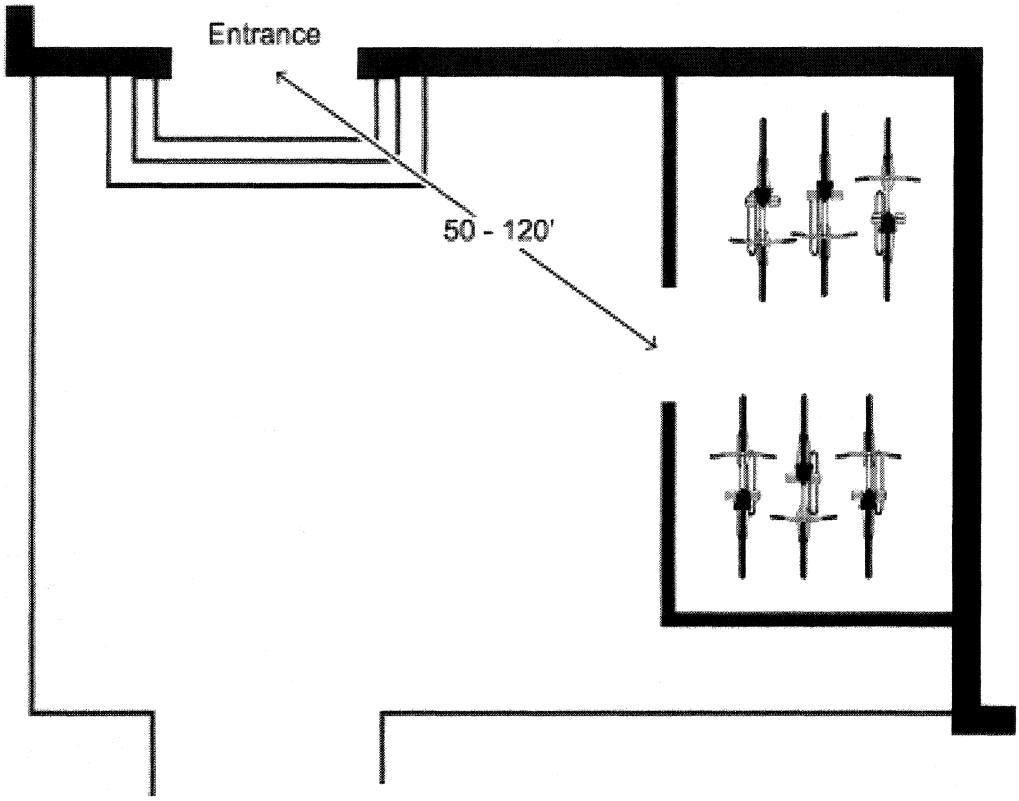
"Inverted U" type racks are most recommended because each element can support two bicycles. Commonly used "wave" type racks are not recommended because they support the bicycle at only one point. Cyclists often park their bikes parallel with the rack, instead of perpendicular as intended, which reduces the rack capacity by half.

The rack element should also resist being cut or detached using common hand tools, especially those that can be concealed in a backpack. Such tools include bolt cutters, pipe cutters, wrenches and pry bars.

Rack
The rack itself is one or more rack elements joined on a common base or arranged in a regular array and fastened to a common mounting surface.

The rack elements may be attached to a single frame or remain single elements mounted in close proximity. They should not be easily detachable from the rack frame or easily removed from the mounting surface. The rack should be anchored so that it cannot be stolen with the bikes attached such as with vandal-resistant fasteners.

The rack should provide easy, independent bike access. Typical inverted "U" rack elements mounted in a row should be placed on 30" centers. Normally, the handlebar and seat heights will allow two bicycles to line up side-by-side in opposite directions. If it is too inconvenient and time-consuming to squeeze the bikes into the space and attach a lock, cyclists will look for an alternative place to park or use one rack element per bike and reduce the projected parking capacity by half.



Rack Area
The rack area is a bicycle parking lot where racks are separated by aisles.

A rack area or "bicycle parking lot" is an area where more than one rack is installed separated by aisles measured from tip to tip of bike tires across the space between racks. The minimum separation between aisles should be 48 inches, which provides enough space for one person to walk one bike. In high traffic areas where many users park or retrieve bikes at the same time, such as at colleges, the recommended aisle width is 72 inches. The depth of each row of parked bicycles should also be 72 inches.

Large rack areas in high turnover areas should have more than one entrance. If possible, the rack area should be protected from the elements. Even though cyclists are exposed to sun, rain and snow while en route, covering the rack area keeps the cyclist more comfortable while parking, locking the bike and loading or unloading cargo. A covering will also help keep the bicycle dry, especially the saddle.

Rack Area Site
The rack area site is the relationship of a rack area to the building entrance or approach.

In general, smaller, conveniently located rack areas should serve multiple buildings, rather than a larger combined, distant one. Racks far from the entrance or perceived to be where bikes will be vulnerable to vandalism will not receive much use.

Rack area location in relationship to the building it serves is very important. The best location is immediately adjacent to the entrance it serves, but racks should not be placed where they can block the entrance or inhibit pedestrian flow. The rack area should be located along a major building approach line and clearly visible from the approach.

The rack area should be no more than a 30-second walk (120 feet) from the entrance it serves and should preferably be within 50 feet. A rack area should be as close or closer than the nearest car parking space, be clearly visible from the entrance it serves and be near each actively used entrance.

Creative Design

There are many creative, three-dimensional bicycle parking racks that work very well. Creative designs should carefully balance form with function. Whatever the rack configuration, the critical issue is that the rack element supports the bike in two places and allows the bicycle to be securely locked. All racks must be carefully manufactured and maintained to prevent weaknesses at the joints that might compromise bicycle security.

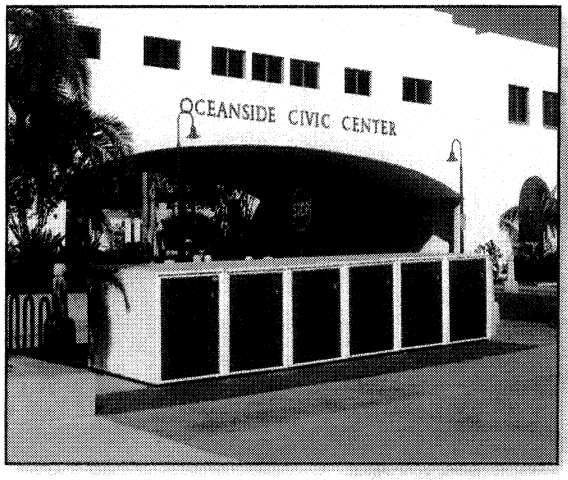
Long Term Parking

Bicycle parking facility intended for long term parking and protected against theft of the entire bicycle and its components and accessories. Three common ways of providing secure long term bicycle parking are:

1. Fully enclosed lockers accessible only by the user - generally involving a charge;

2. A continuously monitored facility that provides at least medium term type bicycle parking facilities - generally available at no-charge;

3. Restricted access facilities in which short term type bicycle racks are provided and access is restricted only to the owners of the bicycles stored therein.



Bike Lockers at City Hall

Perhaps the easiest retrofit is bicycle locker. Generally they are as strong as the locks on the door. They are designed to be secure individual bikes with panniers, computers, lights, etc, left on the bike. Some designs of bike lockers can be stacked so there is twice the parking density. Good protection from the weather is another benefit. Bike lockers tend to be used most for long term bicycle commuter parking in area without a lot of continuous oversight. On the downside, if lockers have coin-operated locks, they can be a target of theft, and may attract various non-intended uses. Bike parking facility in urban parking structures tends to be three groups:

1. Parking company parking garages (often stand-alone) which provide no bike parking - these may be self-service or have a parking attendant collecting fees.

2. Parking in a company building (often subterranean) where bicycle racks, available to the public, are installed in some corner not very suitable for cars -- hopefully within eye-sight of the parking lot attendant. The building owners provide bike parking for corporate goodwill.

3. Buildings with bicycle parking cages (in a car park garage) or bicycle parking rooms, without an attendant associated with them. Access to these secure parking areas is via a

gate or door controlled by an employee badge reader. The employer/building owner provides parking as a service to employees, and probably as part of a commute trip reduction program.

Generally, both of the latter bicycle parking arrangements are available at no cost and there are signs posted prominently that the building owners assume no liability for loss or theft. These garages/parking facilities generally have limited hours of operation, after which they are shuttered (gates closed and locked) for the night and any left vehicles is inaccessible until the facility reopens.

6.1.9 Locating Bicycle Facilities on Roadways

The appropriateness of a roadway facility for bicycling is influenced by a number of factors. These factors can generally be classified into the following categories:

Land Use and Location Factors

These factors represent the most significant category affecting compatibility. Since bicycle trips are generally shorter than motor vehicle or mass transit trips, there must be a manageable distance between origins and destinations, such as between residential areas and places of employment. There are certain key land uses, which are especially likely to generate bicycle traffic if good bicycle facilities are available. These consist of, but are not limited to, transit centers, schools, employment centers with nearby residential areas, recreation areas and mixed use areas.

Physical Constraint Factors

These consist of roadway geometric or physical obstacles to bicycling, which are difficult or costly to remedy. For example, a roadway may be appropriate because of location factors, but not appropriate because of the existence of physical constraints to bicycling such as a narrow bridge, insufficient right-of-way or intersections with restricted lane widths resulting from lane channelization. The feasibility of correcting these physical constraints must be weighed in designating bikeways.

Traffic Operations Factors

These include traffic volume, speed, the number of curb cuts or conflict points along the roadway, sight distance and bicycle-sensitive traffic control devices. Experienced cyclists will use roadways even if they have limiting traffic operational factors, but less confident cyclists will perceive such roadways as unsafe and intimidating. These roadway facilities should be designed or improved to accommodate cyclists through the shared use of roadways. However, they are inappropriate for full designation as bikeways.

Other safety issues such as maintenance and pavement repair are also important considerations in the designation of bikeways, but do not directly affect the planning aspects of appropriate facilities.

6.1.10 Integrating Bicycle Facilities into the Roadway Planning Process

Planning for bicycle facilities on roadways should begin at the very earliest stage of project development on all sizes and types of roadway projects. Even the smallest roadway reconstruction project could result in a missed opportunity if cyclists are not taken into consideration at the initiation of the project. At the municipal level, planners should address these roadway planning issues in the comprehensive context of the Circulation Element in the City's General Plan.

The Bikeway Master Plan is a planning tool for the development of bikeway facilities. It is intended to complement the City's adopted roadway standards, and the General Plan's Circulation Element. The roadway standards rely on the Bikeway Master Plan to provide guidance on the location, type and recommended design of bikeway facilities.

The following procedure offers the planner and designer general guidance in determining

the need for bikeways during the usual phases of project development.

Needs Assessment

The first step in the planning process for any transportation project is the assessment of needs. Existing and planned land use, current and projected traffic levels and the special needs of the area population are examined. There are circumstances in which a portion of the transportation need might be served by non-motorized means, as well as locations where existing bicycle demand would be better served by improved facilities. The following land use and location factors assist in recognizing the potential for non-motorized travel and evaluating the needs of cyclists at the street level. The roadway:

- Serves an activity center, which could generate bicycle trips;
- Is included on a county or municipal bicycle master plan;
- Provides continuity with or between existing bicycle facilities, including those of adjacent cities;
- Is located on a roadway, which is part of a mapped bike route or utilized regularly by local bicycle clubs;
- Passes within two miles of a transit center;
- Passes within two miles of a high school or college;
- Passes within a half mile of an elementary school or middle school;
- Passes through an employment center, especially if there is a significant residential area within a three mile radius; or
- Provides access to a recreation area or otherwise serves a recreation purpose.

If any one of these factors exists, the roadway has the potential to attract less experienced bicycle riders and/or significant numbers of advanced riders. As a result, it should be considered as potentially appropriate for designation as a bikeway.

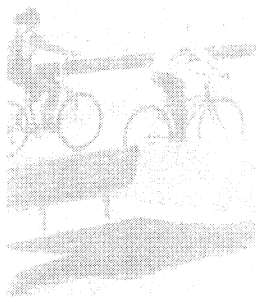
The planner should include a description of the potential significance of the roadway as a bikeway facility in the project initiation or scoping document that will be forwarded to the project designer. If the planner determines that the project is potentially appropriate for designation as a bikeway, the nature of potential bicycle use should be addressed, including factors affecting roadway design, such as roadway truck volumes or intersections.

Preliminary Engineering

Roadway facilities that have been determined through needs assessment to be potentially appropriate for bikeways should be analyzed to determine whether any physical constraints exist that may limit the facility type that could be provided. The following factors should be considered:

- Sufficient right-of-way exists, or additional right-of-way can be acquired to allocate the required space for a bikeway;
- Physical impediments or restrictions exist, but they can be avoided or removed to allow for the required pavement width to provide a bikeway;
- Bridges allow for bicycle access in accordance with bikeway standards; and
- Travel or parking lanes can be reduced in width or eliminated to allow space for bikeways.

If these factors occur, a bikeway should be recommended at the completion of the preliminary engineering phase for the following situations:



- Transportation facilities or segments that connect bicycle traffic generators within five miles of each other; or
- Segments of transportation facilities that provide continuity with existing bicycle facilities.

If physical constraint factors that preclude allocation of space and designation of bikeways

exist along a particular roadway and cannot be avoided or remedied, these factors should be reported to the project manager in the final design phase and alternative design treatments should be generated.

Planning and engineering should consider more than roadway cross-sections. Often, the most difficult potential areas of conflict are at intersections. In general, high speed interchanges, merge lanes and wide radius curbs are unsafe for cyclists and should be avoided.

Final Design And Facility Selection

Class 2 facilities are usually more suitable in urban settings on roads with high traffic volumes and speeds. Class 3 facilities are often used in urban settings to guide cyclists along alternate or parallel routes that avoid major obstacles, or have more desirable traffic operational factors.

In rural settings, Class 2 facilities are not usually necessary to designate preferential use. On higher volume roadways, wide shoulders offer cyclists a safe and comfortable riding area. On low volume roadways, most cyclists prefer the appearance of a narrow, low speed country road.

Table 1 (following page) recommends the type of bikeway and pavement width for various traffic conditions. For locations where pavement widths do not meet the criteria listed in the table, the local municipal bicycle authority should be consulted to assist in the decision-making process.

Where physical obstructions exist that can be removed in the future, the roadway facility should be designed to meet bikeway space allocation requirements and upgraded and designated when the physical constraint is remedied (i.e., bridge is replaced and improved to allow designated facility).

The final design should be coordinated with the bicycle coordinator for review and approval prior to construction.

- Existing and projected traffic volumes and speeds;
- Existence of parking (Can parking be restricted or removed to allow better sight distances?);
- Excessive intersection-conflict points (Can intersection-conflict points be reduced along roadways?);
- Turn lanes at intersections that can be designed to allow space for cyclists;
- Sections with insufficient sight distance or roadway geometrics be changed; or
- Traffic operations be changed or "calmed" to allow space and increased safety for cyclists.

6.2 General Physical Guidelines

The following sections cover physical design guidelines applicable to all bikeway facility types. Guidelines specific to Class 1, 2 and 3 facilities are covered in subsequent sections.

6.2.1 Pavement Width

At a minimum, all roadway projects shall provide sufficient width of smoothly paved surface to permit the shared use of the roadway by bicycles and motor vehicles.

Table 1 is based on the FHWA publication, *Selecting Roadway Design Treatments to Accommodate Bicycles*. Pavement widths represent minimum design treatments for accommodating bicycle traffic. These widths are based on providing sufficient pavement for shared use by bicycle and motor vehicle traffic and should be used on roadway projects as minimum guidelines for bicycle compatible roads. Note that these are recommendations that do not supersede current City roadway standards, and they apply to Class 3 routes only.

Table 6-1: Recommended Lane Widths

Posted Speed Limit	Urban w/ Parking	Urban w/o Parking	Rural
1,200 to 2,000 ADTs			
<30 mph	12 ft. SL	11 ft. SL	10 ft. SL
31-40 mph	14 ft. SL	14 ft. SL	12 ft. SL
41-50 mph	15 ft. SL	15 ft. SL	3 ft. SH
>50 mph	NA	4 ft. SH	4 ft. SH
2,000 to 10,000 ADTs			
<30 mph	14 ft. SL	12 ft. SL	12 ft. SL
31-40 mph	14 ft. SL	14 ft. SL	3 ft. SH
41-50 mph	15 ft. SL	15 ft. SL	4 ft. SH
>50 mph	NA	6 ft. SH	6 ft. SH
More than 10,000 ADTs or Trucks over 5%			
<30 mph	14 ft. SL	14 ft. SL	14 ft. SL
31-40 mph	14 ft. SL	4 ft. SH	4 ft. SH
41-50 mph	15 ft. SL	6 ft. SH	6 ft. SH
>50 mph	NA	6 ft. SH	6 ft. SH

Notes:

Primarily applicable to Class 3 and "Undesignated" routes.

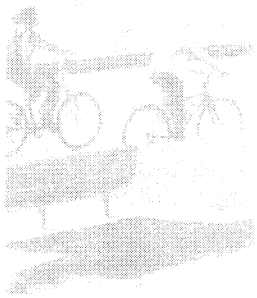
SH = Shoulder, SL = Shared Lane

Shared lane is acceptable for volumes less than 1,200 ADTs.

Provide 8' shoulder for volumes greater than 10,000 ADTs.

Considerations in the selection of pavement width include traffic volume, speed, sight distance, number of large vehicles (such as trucks) and grade. The dimensions given in Table1 for shared lanes are exclusive of the added width for parking, which is assumed to be eight feet. On shared lanes with parking, the lane width can be reduced if parking occurs only intermittently. On travel lanes where curbs are present, an additional one foot is necessary.

On very low volume roadways with ADTs of less than 1,200, even relatively high speed roads pose little risk for cyclists since there will be high probability that an overtaking motor vehicle will be able to widely pass a bicycle. When an overtaking car is unable to immediately pass a bicycle, only a small delay for the motorist is likely. Both cyclists and motorists jointly use these types of roadways in a safe manner and widening of these roads is not usually recommended. Costs of providing widening of these roads can seldom be justified based on either capacity or safety.



Similarly, moderately low volume roadways with ADTs between 1,200 and 2,000 generally are compatible for bicycle use and will have little need for widening. However, since there

is a greater chance of two opposing cars meeting at the same time as they must pass a cyclist, providing some room at the outside of the outer travel lane is desirable on faster speed roadways. On low speed roadways, motorists should be willing to accept some minimal delay.

With ADTs from 2,000 to 10,000, the probability becomes substantially greater that a vehicle overtaking a bicycle may also meet another oncoming vehicle. As a result, on these roads, some room at the edge of the roadway should be provided for cyclists. This additional width should be two to three feet added to a typical 10-foot outer travel lane. At low speeds, such as below 25 m.p.h., little separation is needed for both a cyclist and a motorist to feel comfortable during a passing maneuver. With higher speeds, more room is needed.

At volumes greater than 10,000 ADTs, vehicle traffic in the curb lane becomes almost continuous, especially during peak periods. As a result, cyclists on these roadways require separate space to safely ride, such as a Class 2 facility. In addition, improvements to the roadway edge and the shoulder area will be valuable for motorists as well.

Caltrans guidelines for highways recommend that a full eight-foot paved shoulder be provided for State highways. On highways having ADTs greater than 20,000 vehicles per day, or on which more than five percent of the traffic volume consists of trucks, every effort should be made to provide such a shoulder for the benefit of cyclists, to enhance the safety of motor vehicle movements and to provide "break down" space, as well as a Class 2 facility. Otherwise, the highway should probably not be designated as a bicycle facility.

6.2.2 Sight Distance

Roadways with adequate sight distance will allow a motorist to see, recognize, decide on the proper maneuver, and initiate actions to avoid a cyclist. Adequate decision sight distance is most important on high speed highways and narrow roadways where a motorist would have to maneuver out of the travel lane to pass a cyclist.

The pavement widths given in Table 1 are based on the assumption that adequate sight distance is available. In situations where there is not adequate sight distance, provision of additional width may be necessary.

6.2.3 Truck Traffic

Roadways with high volumes of trucks and large vehicles, such as recreational vehicles, need additional space to minimize cyclist/motorist conflicts on roadways. Additional width allows trucks to overtake cyclists with less maneuvering and the cyclists will experience less lateral force from truck drafts. This additional width will also provide greater sight distance for following vehicles.

Although there is no established threshold, additional space should be considered when truck volumes exceed five percent of the traffic mix, or on roadways that serve campgrounds, or where a high level of tourist travel is expected using large recreational vehicles. Where truck volumes exceed 15 percent of the total traffic mix, widths shown on Table 1 should be increased by one foot minimum.

6.2.4 Steep Grades

Steep grades influence overtaking of cyclists by motorists. Inexperienced cyclists climbing steep grades are often unsteady (wobbly) and may need additional width. Also, the difference in speed between a slow, climbing cyclist and a motor vehicle results in less time for the driver to react and maneuver around a cyclist. Motor vehicle slowing on a steep grade to pass a cyclist can result in a diminished level of service.

6.2.5 Unavoidable Obstacles

Short segments of roadways with multiple unavoidable obstacles that result in inadequate roadway width are acceptable on bicycle compatible roadways if mitigated with signing or

striping. Typical examples include bridges with narrow widths and sections of roadway that cannot be widened without removing significant street trees. These conditions preferably should not exist for more than a quarter of a mile, or on high speed highways. "Zebra" warning striping should be installed to shift traffic away from the obstacle and allow for a protected buffer for bicycle travel.

In situations where a specific obstacle such as a bridge abutment cannot be avoided, a pavement marking consisting of a single six inch white line starting 20 feet before and offset from the obstacle can also be used to alert cyclists that the travel lane width will soon narrow ahead. (See Section 1003.6 of the Caltrans *Highway Design Manual* for specific instructions.)

In either situation, where bicycle traffic is anticipated, a "SHARE THE ROAD" sign should be used to supplement the warning striping. On longer sections of roadway that are irrevocably narrow, edge striping should be employed to narrow the travel lane and apportion pavement space for a partial shoulder. In situations where even these measures may not provide adequate roadway space for cyclists, it is recommended that an alternate route be designated.

6.2.6 Pavement Design

Though wider tires are now very common and bicycle suspension systems are becoming increasingly prevalent, bicycles still require a riding surface without significant obstacles or pavement defects because they are much more susceptible to such surface irregularities than are motor vehicles. Asphalt is preferred over concrete where shoulders are employed. The outside pavement area where bicycles normally operate should be free of longitudinal seams. Where transverse expansion joints are necessary on concrete, they should be saw cut to ensure a smooth transition. In areas where asphalt shoulders are added to existing pavement, or where pavement is widened, pavement should be saw cut to produce a tight longitudinal joint to minimize wear and expansion of the joint.

6.2.7 Raised Roadway Markers

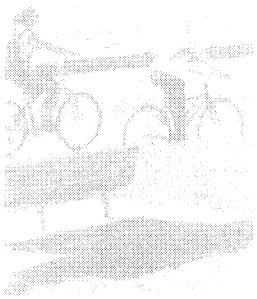
Raised roadway markers such as reflectors or rumble strips should not be used on roadway edges where bicycles are most likely to operate because they create a surface irregularity that can be hazardous to bicycle stability. Painted stripes or flexible reflective tabs are preferred. In no case should strips of raised reflectors intended to warn motorists to reduce vehicle speeds prior to intersections be allowed to cross through the bicycle travel lane.

6.2.8 Utilities

Because bicycles are much more sensitive to pavement irregularities than motor vehicles, utility covers should be adjusted as a normal function of any pavement resurfacing or construction operations. Failure to do so can result in the utility cover being sunken below the paving surface level which creates a hazard experienced cyclists refer to as "black holes." Also, it is common practice to excavate trenches for new utilities at road edges, the same location as bicycle facilities. When such trenching is completed, care should be given to replacing the full surface of the bicycle lane from the road edge to the vehicle travel lane instead of narrow strips that tend to settle or bubble, causing longitudinal obstructions. Replacement of the bike lane striping should also be required.

6.2.9 Drainage Facilities

Storm water drainage facilities and structures are usually located along the edge of roadways where they can present conflicts with cyclists. Careful consideration should be given to the location and design of drainage facilities on roadways with bicycle facilities.



All drainage grate inlets pose some hazard to bicycle traffic. The greatest hazard comes from stream flow drainage grates which can trap the front wheel of a bicycle and cause the cyclist to lose steering control, or allow the narrow bicycle wheels to drop into the grate. Another type of hazard may be caused by cyclists swerving into the lane of traffic to avoid

a grate or cover. Riding across any wet metal surface increases the chances of a sudden slip fall.

Only a "bicycle safe" drainage grate with acceptable hydraulic characteristics should be used. The inlet grate should be used in all normal applications and should be installed flush with the final pavement. Where additional drainage inlet capacity is required because of excessive gutter flow or grade (greater than two percent), double inlets should be considered. Depressed grates and stream flow grates should not be used except in unique or unusual situations that require their use and only outside the lane sharing area. Where necessary, depressed grates should only be installed on shoulders six feet wide or greater. Where projects offer the possibility for replacement of stream flow grates located in the lane sharing area, these grates should be replaced with the "bicycle safe" grate.

When roads or intersections are widened, new bicycle safe drainage grates should be installed at a proper location at the outside of the roadway, existing grates and inlet boxes should be removed and the roadway reconstructed. Drainage grate extensions, the installation of steel or iron cover plates or other "quick fix" methods which allow for the retention of the subsurface drain inlet are unacceptable measures since they will create a safety hazard in the portion of the roadway where cyclists operate.

Manholes and covers should be located outside of the lane sharing area wherever possible. Utility fixtures located within the lane sharing area, or any travel lane used by bicycle traffic, should be eliminated or relocated. Where these fixtures cannot be avoided, the utility fixture cover should be made flush with the pavement surface.

6.2.10 Combination Curb and Gutter

These types of curbs reduce space available for cyclists. The width of the gutter pan should not be used when calculating the width of pavement necessary for shared use by cyclist. On steep grades, the gutter should be set back an additional one foot to allow space to avoid high speed crashes caused by the longitudinal joint between the gutter pan and pavement. Where the combination curb and gutter is used, pavement width should be calculated by adding one foot from the curbed gutter.

6.2.11 Bridges

Bridges provide essential crossings over obstacles such as rivers, rail lines and high speed roadways, but they have been almost universally constructed for the expedience of motor vehicle traffic and often have features that are not desirable for bicycling. Among these features are widths that are narrower than the approach roadways (especially when combined with relatively steep approach grades), low railings or parapets, high curbs and expansion joints that can cause steering problems.

Though sidewalks are generally not recommended for cycling, there are limited situations such as long or narrow bridges where designation of the sidewalk as an alternate bikeway facility can be beneficial to cycling, especially when compared to riding in the narrow bridge roadway. This is only recommended where the appropriate curb cuts, ramps and signage can also be included. Using the bridge sidewalk as a bikeway facility is especially useful where pedestrian use is expected to be minimal. Appropriate signage directed to all potential users should be installed so that they will be aware of the shared use situation. Bridge railings or barrier curb parapets where bicycle use is anticipated should be a minimum of 4.5 feet high.

Short of wholesale replacement of existing narrow bridges over rail lines and highways, there are a few measures to substantially improve safety for cyclists. Signage warning motorists of both the presence of cyclists and the minimal bridge width should be installed at the bridge approaches. "Zebra" warning stripe areas should be painted along high curbs to deter cyclists from riding too close to them, which can result in the pedal hitting these high, curbs, causing a crash. This situation is of particular concern since the cyclist will want to

stay as far to the right as possible to avoid passing motor vehicles traffic, even though riding far to the right increases the chances of hitting the high curb.

Though the first alternative mentioned above, bridge replacement, is the preferred alternative for bridges that are too narrow, it is the least likely to occur due to cost. A second alternative is to direct cyclists to alternate, safer routes, but this will not always be practical since highway and rail crossing points are usually limited in number and considerable distances apart. In any case, these other crossing points may well have similar width restrictions.

A third alternative is to build separate bridges for cyclist and pedestrian use. Where access warrants a workable solution, this could be a cost-effective long-term solution compared to rebuilding the motor vehicle bridge. These additional bridges could be built adjacent to the motor vehicle bridges, or be installed well away from them, depending upon where best to conveniently accommodate cyclists and pedestrians. An advantage to constructing the bridges away from the motor vehicle bridges is that only one bridge would be needed since building bicycle/pedestrian bridges immediately adjacent to existing motor vehicle bridges would require constructing two one-way spans, one on each side of the roadway, for optimum user safety.

If sidewalk widths are sufficient, directing cyclists to use the sidewalks and installing ramps at the bridge ends is a possible solution. In general, sidewalks are not recommended as a cycling venue and riding on sidewalks is illegal, but in cases where narrow bridges are not expected to be rebuilt for an extended period of time, this may be a reasonable alternative. If possible, a railing should be installed between the roadway and the sidewalk.

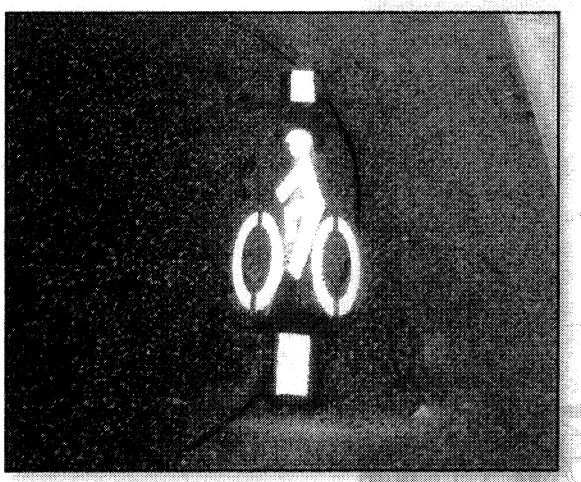
Finally, it should be noted that all the other alternatives are inherently inferior to the first alternative of rebuilding narrow bridges in terms of safety, and should only be considered where the first alternative cannot be implemented.

6.2.12 Traffic Control Devices

As legitimate users of California's roadways, cyclists are subject to essentially the same rights and responsibilities as motorists. In order for cyclists to properly obey traffic control devices, those devices must be selected and installed to take their needs into account. All traffic control devices should be placed so cyclists who are properly positioned on the road can observe them. This includes programmed visibility signal heads.

Traffic Signals and Detectors

Traffic-actuated signals should accommodate bicycle traffic. Detectors for traffic-activated signals should be sensitive to bicycles, should be located in the cyclist's expected path and stenciling should direct the cyclist to the point where the bicycle will be detected. Examples of successful bicycle-sensitive signal detector installation and their specific applications are shown below.



Bicycle Detection symbol in Oceanside

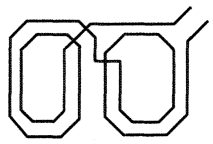
Since detectors can fail, added redundancy in the event of failure is recommended in the form of pedestrian push buttons at all signalized intersections. These buttons should be mounted in a location that permits their activation by a cyclist without having to dismount.

It is common for bicycles to be made of so little ferrous metals that they may not be detectable by many currently installed types of loop detectors. As an convenience for cyclists, the strongest loop detection point should be marked with a standard symbol (See Figure 1003.2D: Bike Loop Detector Pavement Marker in Caltrans *Highway Design Manual, Chapter 1000 - Bikeway*

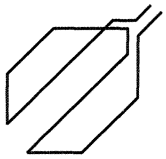
Planning and Design).

Where left turn lanes are provided and only protected left turns are allowed, bicycle sensitive loop detectors should be installed in the left turn lane, or a pedestrian style push button should be provided that is accessible to the cyclist in the median immediately adjacent to the turn lane to permit activation of the left turn phase. Where moderate or heavy volumes of bicycle traffic exist, or are anticipated, bicycles should be considered in the timing of the traffic signal cycle as well as in the selection and placement of the traffic detector device. In such cases, short clearance intervals should not be used where cyclists must cross multi-lane streets. According to the 1991 AASHTO *Guide for the Development of Bicycle Facilities*, a bicycle speed of 10 m.p.h. and a perception/reaction time of 2.5 seconds can be used to check the clearance interval. Where necessary, such as for particularly wide roadways, an all-red clearance interval can be used.

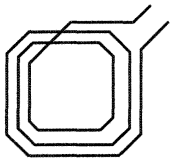
In general, for the sake of cyclist safety, protected left turns are preferred over unprotected left turns. In addition, traffic signal controlled left turns are much safer for cyclists than left turns at which motorists and cyclists must simply yield. This is because motor vehicle drivers, when approaching an unprotected left turn situation or planning to turn left at a yield sign, tend to watch for other motor vehicles and may not see an approaching cyclist. More positive control of left turns gives cyclists an added margin of safety where they need it most.



Quadrupole Loop
- Detects most stronly in center
- Sharp cut-off of sensitivity
- Used in bike lanes



Diagonal Quadrupole Loop
- Sensitive over whole area
- Sharp cut-off of sensitivity
- Used in shared lanes



Standard Loop
- Detects strongest over wires
- Gradual cut-off
- Used in advanced detection

Signing

When designating a bicycle route, the placement and spacing of signs should be based on the Caltrans *Traffic Manual* and *Highway Design Manual.* For bike route signs to be functional, supplemental plaques can be placed beneath them when located along routes leading to high demand destinations (e.g. "To Downtown," "To Transit Center," etc.) Since bicycle route continuity is important, directional changes should be signed with appropriate arrow sub-plaques. Signing should not end at a barrier. Instead, information directing the cyclist around the barrier should be provided.

According to the *Manual on Uniform Traffic Control Devices (MUTCD)* Part 2A-6: "Care should be taken not to install too many signs. A conservative use of regulatory and warning signs is recommended as these signs, if used to excess, tend to lose their effectiveness. On the other hand, a frequent display of route markers and directional signs to keep the driver informed of his location and his course will not lessen their value."

"BIKE ROUTE" - This sign is intended for use where no unique designation of routes is desired. However, when used alone, this sign conveys very little information. It can be used in connection with supplemental plaques giving destinations and distances. (See Section 1003-3 of the Caltrans *Highway Design Manual* and Part 9B-22 of the *MUTCD* for specific information on sub-plaque options.)

Roadways appropriate for bicycle use, but are undesignated, usually do not require regulatory, guide or informational signing in excess of what is normally required for motorists. In certain situations, however, additional signing may be needed to advise both motorists and cyclists of the shared use of the roadway, including the travel lane.

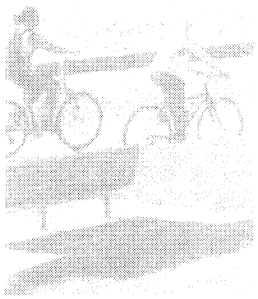
"SHARE THE ROAD" - This sign is recommended where the following roadway conditions occur:

- Shared lanes (especially if lane widths do not comply with Table 1) with relatively high posted travel speeds of 40 m.p.h. or greater;
- Shared lanes (conforming with Table 1) in areas of limited sight distance;
- Situations where shared lanes or demarcated shoulders or marked bike lanes are dropped or end and bicycle and motor vehicle traffic must begin to share the travel lane;
- Steep descending grades where bicycle traffic may be operating at higher speeds and requires additional maneuvering room to shy away from pavement edge conditions;
- Steep ascending grades, especially where there is no paved shoulder, or the shared lane is not adequately wide and bicycle traffic may require additional maneuvering room to maintain balance at slow operating speeds;
- High volume urban conditions, especially those with travel lanes less than the recommended width for lane sharing;
- Other situations where it is determined to be advisable to alert motorists of the likely presence of bicycle traffic and to alert all traffic of the need to share available roadway space.

6.2.13 Intersections and Driveways

High speed, wide radius intersection designs with free rights turns, multiple right turn lanes, and wide radius turns increase traffic throughput for motor vehicles by minimizing speed differentials between entering and exiting vehicles and through vehicles. However, these designs are dangerous for cyclists (and pedestrians) by design since they exacerbate speed differential problems faced by cyclists traveling along the right side of a roadway and encourage drivers to fail to yield the right-of-way to cyclists. As a result, Caltrans District 11 (San Diego County area) no longer allows such wide radius free right turns at interchanges.

Where they already exist, specific measures should be employed to ensure that the movement of cyclists along the roadway will be visible to motorists and to provide cyclists with a safe area to operate to the left of these wide radius right turn lanes. One method to accomplish this is to stripe (dash) a bicycle lane throughout the intersection area. Also, "SHARE THE ROAD" signs should be posted in advance of the intersection to alert existing traffic. In general, however, curb radii should be limited to short distances, which helps to communicate to the motorist that he or she must yield the right-of-way to cyclists traveling and pedestrians walking along the sidewalk or roadway margin approaching the intersection.



Even so, wherever possible, such intersection conditions should be eliminated. Reconstruction of intersections to accomplish this is a legitimate use of bicycle program funds.

Sand, gravel and other debris in the cyclist's path present potential hazards. In order to minimize the possibility of debris from being drawn onto the pavement surface from unpaved intersecting streets and driveways, during new construction, reconstruction and resurfacing, all unimproved intersecting streets and driveways should be paved back to the right-of-way

line or a distance of 10 feet. Where curb cuts permit access to roadways from abutting unpaved parking lots, a paved apron should be paved back to the right-of-way line, preferably 10 feet from the curb line. These practices will lessen the need for maintenance debris removal. The placement of the paved back area or apron should be the responsibility of those requesting permits for access via curb cuts from driveways and parking lots onto the roadway system.

6.2.14 Roadside Obstacles

To make certain that as much of the paved surface as possible is usable by bicycle traffic, obstructions such sign posts, light standards, utility poles and other similar appurtenances should be set back a one foot minimum "shy distance" from the curb or pavement edge with exceptions for guard rail placement in certain instances. Additional separation distance to lateral obstructions is desirable. Where there is currently insufficient width of paved surface to accommodate bicycle traffic, any placement of equipment should be set back far enough to allow room for future projects (widening, resurfacing) to bring the pavement width into conformance with these guidelines. Vertical clearance to obstructions should be a minimum of 8 feet, 6 inches. (See Section 1003.1 of the Caltrans *Highway Design Manual.*)

6.2.15 Railroad Crossings

As with other surface irregularities, railroad grade crossings are a potential hazard to bicycle traffic. To minimize this hazard, railroad grade crossings should, ideally, be at a right angle to the rails. This minimizes the possibility of a cyclist's wheels being trapped in the rail flangeway, causing loss of control. Where this is not feasible, the shoulder (or wide outside lane) should be widened, or "bumped out" to permit cyclists to cross at right angles. (See Section 1003.6 of the Caltrans *Highway Design Manual.*)

It is important that the railroad grade crossing be as smooth as possible and that pavement surfaces adjacent to the rail be at the same elevation as the rail. Pavement should be maintained so that ridge buildup does not occur next to the rails.

Options to provide a smooth grade crossing include removal of abandoned tracks, use of compressible flangeway fillers, timber plank crossings or rubber grade crossing systems. These improvements should be included in any applicable project.

6.2.16 TSM Type Improvements

Transportation Systems Management (TSM) improvements are minor roadway improvements which enhance motor vehicle flow and capacity. They include intersection improvements, channelization, addition of auxiliary lanes, turning lanes and climbing lanes. TSM improvements must consider the needs of bicycle traffic in their design, or they may seriously degrade the ability of the roadway to safely accommodate cyclists. The inclusion of wider travel lanes or adjacent bike lanes will decrease traffic conflicts and increase vehicular flow. Designs should provide for bicycle compatible lanes or paved shoulders. Generally, this requires that the outside through lane and (if provided) turning lane be 14 feet wide. Auxiliary or climbing lanes should conform to Table 1 by either providing an adjacent paved shoulder, or a shared lane width of at least 15 feet. Where shared lanes and shoulders are not provided, it must be assumed that bicycle traffic will take the lane.

6.2.17 Marginal Improvements and Retrofitting Existing Roadways

There may be instances or locations where it is not feasible to fully implement guidelines pertaining to the provision of adequate pavement space for shared use due to environmental constraints or unavoidable obstacles. In such cases, warning signs and/or pavement striping must be employed to alert cyclists and motorists of the obstruction, alert motorists and cyclist of the need to share available pavement space, identify alternate routes (if they exist), or otherwise mitigate the obstruction.

On stretches of roadway where it is not possible to provide recommended shoulder or lane widths to accommodate shared use, bicycle traffic conditions can be improved by:

- Striping wider outside lanes and narrower interior lanes; or

- Providing a limited paved shoulder area by striping a narrow travel lane. This tends to slow motor vehicle operating speeds and establish a space (with attendant psychological benefits) for bicycle operation.

Where narrow bridges create a constriction, "zebra" striping should be used to shift traffic away from the parapet and provide space for bicycle traffic.

Other possible strategies include:

- Elimination of parking or restricting it to one side of the roadway;
- Reduction of travel lanes from two in each direction to one in each direction plus center turn lane and shoulders; or
- Reduction of the number of travel lanes in each direction and the inclusion or establishment of paved shoulders.

6.2.18 Access Control

Frequent access driveways, especially commercial access driveways, tend to convert the right lane of a roadway and its shoulder area into an extended auxiliary acceleration and deceleration lane. Frequent turning movements, merging movements and vehicle occupancy of the shoulder can severely limit the ability of cyclists to utilize the roadway and are the primary causes of motor vehicle-bicycle collisions. As a result, access control measures should be employed to minimize the number of entrances and exits onto roadways. For driveways having a wide curb radius, consideration should be given to marking a bicycle lane through the driveway intersection areas. As with other types of street intersections, driveways should be designed with sufficiently tight curb radii to clearly communicate to motorists that they must fully stop and then yield the right-of-way to cyclists and pedestrians on the roadway.

6.2.19 Bikeway Reconstruction after Construction

Since roadways with designated bicycle facilities carry the largest volumes of users, their reconstruction should be of particular concern. Unfortunately, bicycle facilities are often installed piecemeal and users can find themselves facing construction detours and poor integration of facilities where the facilities begin and end.

Bicycles facilities also sometimes seem to "disappear" after roadway construction occurs. This can happen incrementally as paving repairs are made over time and are not followed by proper bikeway re-striping. When combined with poor surface reconstruction following long periods out of service due to road work, this can result in the eventual loss of affected bikeway facilities and decrease the number of cyclists regularly using the facilities.

Adjacent construction projects that require the demolition and rebuilding of roadway surfaces can cause problems in maintaining and restoring bikeway function. Construction activities controlled through the issuance of permits, especially driveway, drainage, utility, or street opening permits, can have an important effect on the quality of a roadway surface where cyclists operate. Such construction can create hazards such as mismatched pavement heights, rough surfaces or longitudinal gaps in adjoining pavements, or other pavement irregularities.

Permit conditions should ensure that pavement foundation and surface treatments are restored to their pre-construction conditions, that no vertical irregularities will result and that no longitudinal cracks will develop. Stricter specifications, standards and inspections designed to prevent these problems should be developed, as well as more effective control of construction activities wherever bikeways must be temporarily demolished. A five-year bond should be held to assure correction of any deterioration, which might occur as a result

of faulty reconstruction of the roadway surface.

Spot widening associated with new access driveways frequently results in the relocation of drainage grates. Any such relocation should be designed to permanently close the old drainage structure and restore the roadway surface. New drainage structures should be selected and located to comply with drainage provisions established in these guidelines.

6.2.20 Maintenance Priorities

Bikeway maintenance is easily overlooked. The "sweeping" effect of passing motor vehicle traffic readily pushes debris such as litter and broken glass toward the roadway edges where it can accumulate within an adjoining bicycle facility. Since the potential for loss of control can exist due to a blowout caused by broken glass, or through swerving to avoid other debris, proper maintenance is directly related to safety. For this reason, street sweeping must be a priority on roadways with bike facilities, especially in the curb lanes and along the curbs themselves. The police department could assist by requiring towing companies to fully clean up crash scene debris, or face a fine. This would prevent glass and debris from being left in place after a motor vehicle crash, or simply swept to the curb or shoulder area.

A suggested minimum monthly sweeping schedule is recommended for heavily used Class 1 and 2 facilities, and twice a year where use is light. Class 3 facilities should be swept twice a year.

The availability of a forum through which citizens can conveniently notify the proper city authority of bikeway facility problems or shortcomings is desirable. Several local cities make available a service request form via their Internet home pages to allow citizens to report problems such as streets, sidewalks, tree trimming and other civil engineering and infrastructural issues. They generally do not mention bicycle facilities specifically in their list of selected problems, but do offer the user the opportunity to type in the particulars of any street-related issue.

6.2.21 Intermodal Planning and Facilities

Creating an environment conducive to intermodal transit begins with providing the proper types of facilities and amenities in locations convenient enough to attract potential users. Such facilities can include those described in the following sections.

Bike Lockers and Racks

The provision of bicycle racks and lockers is an important first step in making a multi-modal system work for cyclists. Their presence encourages cyclists to use available transit because these facilities help to alleviate concerns about security, primarily theft or vandalism of bicycles parked for long periods.

Bus-mounted Racks

The provision of bus-mounted bicycle racks on bus routes should encourage cyclists to use the bus system, especially in the eastern sections of the City where topography is the most pronounced. These racks are mounted on the front of the bus to increase visibility between the bus driver and the cyclist using the rack and to decrease the chance of theft while the bus is stopped.

6.2.22 Traffic Calming

There exist roadway conditions in practically all communities where controlling traffic movements and reducing motor vehicle speeds is a worthwhile way to create a safer and less stressful environment for the benefit of non-motorized users such as pedestrians and cyclists. These controlling measures are referred to as traffic calming. These measures are also intended to mitigate impacts of vehicular traffic such as noise, crashes and air pollution, but the primary link between traffic calming and bicycle planning is the relationship between motor vehicle speed and the severity of crashes. European studies have shown that instituting traffic calming techniques significantly decreases the number of pedestrian

and cyclist fatalities in crashes involving motor vehicles, as well as the level of injuries and air pollution, without decreasing traffic volume.

Stop Signs/Yield Signs

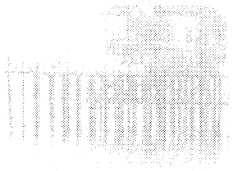
The installation of stop signs is a common traffic calming device intended to discourage vehicular through traffic by making the route slower for motorists. However, stop signs are not speed control devices, but rather right-of-way control devices. They do not slow the moving speed of motor vehicles and compliance by cyclists is very low. Requiring motor vehicles to stop excessively also contributes to air pollution. Cyclists are even more inconvenienced by stop signs than motorists because unnecessary stopping requires them to repeatedly reestablish forward momentum. The use of stop signs as a traffic management tool is not generally recommended unless a bicycle route must intersect streets with high motor vehicle traffic volumes. Controlled intersections generally facilitate bicycle use and improve safety and stop signs tend to facilitate bicycle movement across streets with heavy motor vehicular traffic. An alternative to stop signs may be to use yield signs or other traffic calming devices as methods to increase motorist awareness of crossing cyclists.

Speed Bumps and Tables

Though many cities are no longer installing speed bumps, they have been shown to slow motor vehicle traffic speeds and reduce volume. If speed bumps are employed as a traffic management tool, a sufficiently wide gap must be provided to allow unimpeded bicycle travel around the bump to prevent safety hazards for cyclists. Standard advance warning signs and markers must be installed as well.

Partial Traffic Diverters

These traffic calming devices include roundabouts and chicanes, both of which force traffic to follow a curved path, which had formerly been straight. They are usually employed in areas of traditional grid street configuration. These devices can actually increase traffic hazards if they are not substantial enough to decrease motor vehicle speeds, or if appropriate side street access points are not controlled.

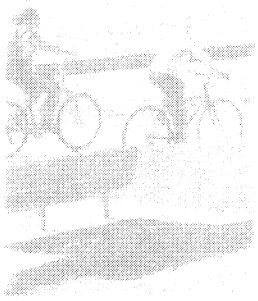


Total Traffic Diverters

These diverters close roadways to motor vehicles only, or divert them to other routes while continuing to provide access to non-motorized users. Partial diverters allow access for cyclists in both directions, but block motor vehicle entry at one end. Both devices reduce motor vehicle driver options as a means to reduce the local traffic volume while allowing unrestricted access for pedestrians and cyclists. They are only useful where bicycles are fully exempt from the restrictions preventing the access of motor vehicles. Bicycle access should be clearly signed where motor vehicle access is limited so that cyclists are made aware that they can proceed even though motor vehicles cannot.

Curb Extensions and Radius Reductions

Larger curb radii are intended to facilitate high speed right-turn movements for the convenience of motorists. However, these larger radii are more dangerous for crossing and adjacent cyclists and pedestrians both because of the resulting higher motor vehicle speeds and the longer crossing distance for the cyclists and pedestrians. Motorists tend to spend less time looking for pedestrians and cyclists when they are attempting to make a high speed turn because their attention is focused on watching for oncoming traffic from the left. Their tendency to watch for pedestrians crossing from the right is also reduced. In addition, this type of intersection encourages higher speed movements across the bicycle travel lane, increasing the risk of collisions. To avoid these problems, curb radii should be reduced and curb extensions installed that pinch in toward the motor vehicle traffic lanes. This narrowing of the roadway tends to reduce traffic speeds, which creates a longer period for drivers to see potential conflicts before making right turns. However, due to the resulting reductions in motor vehicle speeds, this approach may not be appropriate at congested intersections. In such cases, there should instead be a safe lane and crossover segment especially for



cyclists.

Extensions are curb bulbs extending into the intersection from the corners of one or both of the intersecting roadways. Reducing curb radii functionally narrows the intersection, shortening the crossing distance for pedestrians and cyclists and slowing approaching traffic. Curb extensions are even more effective than reduced curb radii in decreasing crossing distance and slowing traffic. They can also serve the additional purposes of defining parking lanes and improving visibility at corners.

The use of curb extensions should be confined to residential areas and commercial zones with moderate posted speed limits since they prevent the use of the curb lane for cycling in favor of vehicular parking. Reduced curb radii can be used more widely, or on streets with routine large truck use requiring right turns.

6.3 Class 1 Multi-Use Path Guidelines

Class 1 facilities are generally paved multi-use paths, separated from motor vehicle traffic. Off-street routes are rarely constructed for the exclusive use of cyclists since other non-motorized user types will also find such facilities attractive. For that reason, the facilities recommended in this master plan should be considered multi-use where cyclists will share the pathways with other users. Recommended Class 1 paths are intended to provide commuting and recreational routes unimpeded by motor vehicle traffic.

No matter what their primary focus, most cyclists will find bicycle paths inviting routes to ride, especially if travel efficiency is secondary to enjoyment of cycling. Since these paths can augment the existing roadway system, they can extend circulation options for cyclists, making trips feasible which would not otherwise be possible if the cyclists had to depend exclusively on roadways, especially in areas where usable roads are limited. Class B and C (casual riders and children) cyclists would likely also appreciate the relative freedom from conflicts with motor vehicles compared to riding on typical roadways.

By law, the presence of a Class 1 route near an existing roadway does not justify prohibiting bicycles on the parallel or nearly parallel roadway. Where a bikeway master plan calls for Class 1 routes parallel to the alignments of planned roadways, these roadways should still be designed to be compatible with bicycle use. Two reasons to retain parallel facilities are that an experienced cyclist may find Class 1 paths inappropriate because of intensive use, or the routes may not be direct enough. By the same token, the Class 1 path will likely be much more attractive to less experienced cyclists than a parallel facility on the street.

In general, Class 1 facilities should not be placed immediately adjacent to roadways. Where such conditions exist, Class 1 facilities should be offset from the street as much as possible and separated from it by a physical barrier. These measures are intended to promote safety for both the cyclists and the motorists by preventing unintended movement between the street and the Class 1 facility. (See Section 1003.1 (5) of the Caltrans *Highway Design Manual.*)

6.3.1 Class 1 Planning Issues Shared-Use of Multiple Use Paths

Since off-street paths (Class 1) are now generally regarded as multi-use and not for the exclusive use of cyclists, they must be designed for the safety of both cyclists and other expected user types. Heavy use of multi-use trails can create conflicts between different types of users. These conflicts can include speed differentials between inexperienced and experienced cyclists as well as between pedestrians, joggers and in-line skaters, differences in the movements typical of particular user types and even the kinds of groupings common to the different user types as they casually move down the pathway.

As long as volumes are low, the level of conflict between different user types can be managed without enforcement. However, even moderate increases in user volume can create substantial deterioration in level of service and safety. Conflicts between different user types

are especially likely to occur on regionally significant recreational trails that attract a broad diversity of users, such as the Bayshore Bikeway. In general, paths that are expected to receive heavy use should be a minimum of 14 feet wide, paths expected to experience moderate use should be at least 12 feet wide and low volume paths can be 10 feet wide. Caltrans Class 1 requirements call for eight feet (2.4 meters) as the minimum width with two-foot (0.6 meters) clear areas on each side.

Regulation of Multiple Use Paths

The potential for multiple-use path conflicts has increased substantially in recent years with the increased popularity of jogging and in-line skating. Where multi-use paths were once commonly used primarily by pedestrians and secondarily by cyclists, today they tend to be used by a conbination of pedestrians, cyclists and in-line skaters. In-line skating continues to be one of the fastest growing sport in America. Also, the majority of bicycles sold in the United States over the last decade have been mountain and "comfort" bikes, far outstripping sales of drop-bar type road bike sales. These bikes' relative comfort and upright riding position have helped to encourage inexperienced cyclists who previously rarely rode to do so more often.

Methods used to reduce trail conflicts have included providing separate facilities for different groups, prohibiting certain user types, restricting certain uses to specific hours, widening existing facilities or marking lanes to regulate traffic flow. Examples of all of these types of actions occur along southern California's coastal trails where conflicts between different user types can be especially severe during peak periods.

Compatibility of Multiple Use of Paths

Joint use of paths by cyclists and equestrians can pose problems due to the ease with which horses can be startled. Also, the requirements of a Class 1 bikeway facility include a solid surface, which is not desirable for horses. Therefore, where either equestrian or cycling activity is expected to be high, separate trails are recommended. On facilities where Class 1 designation is not needed and the facility will be unpaved, mountain bikes and horses can share the trail if adequate passing width is provided, the expected volume of traffic by both groups is low and available sight distances allow equestrians and cyclists to see and anticipate each other. Education of all path users in "trail etiquette" has also proven to be successful on shared paths.

Urban Access Pathways

Conflicts between different user types on multiple use routes occur primarily on heavily used recreational paths, or near major pedestrian trip generators. Lightly used neighborhood pathways and community trails can be safely shared by a variety of user types. Construction of urban access pathways between adjoining residential developments, schools, neighborhoods and surrounding streets can substantially expand the circulation opportunities for both pedestrians and cyclists.

However, bicycle use of urban access pathways should not include sidewalks adjacent to streets for a number of reasons. First, sidewalks are designed for pedestrian speeds and maneuverability. Second, they are usually encumbered by parking meters, utility poles, benches, trees, etc. Third, other types of users and their specific types of maneuverability can also pose a safety issue for cyclists.

Though sidewalks are, in general, not conducive to safe cycling, an exception is Class C cyclists, young children. This type of bicycle use is generally acceptable because it provides young children who do not yet have the judgment or skill to ride in the street an opportunity to develop their riding skills. Sidewalks in residential areas generally have low pedestrian volumes and are usually accepted as play areas for children.

Finally, one other exception to sidewalk use by cyclists should be allowed. This is where the walkway is at least eight feet wide and well away from streets, such as within parks. In

such cases, bicycle use on walkways can occur safely.

Bicycle Paths Adjacent to Roadways

Two-way bicycle facilities located immediately adjacent to a roadway are not recommended because they require one direction of bicycle traffic to ride against motor vehicle traffic, contrary to the normal "Rules of the Road." This puts the wrong way cyclists in the motorists' "blind spot" at intersections where they do not have the right-of-way, or are not noticed by motorists turning right because the cyclists are not on the roadway. Many cyclists will also find it less convenient to ride on this type of facility as compared to streets, especially for utility trips such as commuting. This more experienced group of cyclists may find the roadway more efficient, safer, or better maintained than the adjacent bicycle facility. The AASHTO guide states that: "...bicycle lanes, or shared roadways should generally be used to accommodate bicycle traffic along highway corridors rather than providing a bicycle path immediately adjacent to the highway."

6.4 Design of Class 1 Facilities (Paths Primarily Used by Bicycles)

A substantial portion of the following sections is taken directly from the *AASHTO Guide for the Development of Bicycle Facilities*, 1991. Note that AASHTO's use of the term "bicycle path" is equivalent to a "Class 1 bicycle facility" as defined by Caltrans and as used in this master plan. Also, the AASHTO term "highway" is synonymous with the term "roadway." Finally, all measurements in the Caltrans documents are in metric form.

6.4.1 Width and Clearance

The paved width and the operating width required for a bicycle path are primary design considerations. Under most conditions, recommended paved width for a two-directional bicycle path is 10 feet. In some instances, however, a minimum of eight feet can be adequate. This minimum should be used only where the following conditions prevail: (1) bicycle traffic is expected to be low, even on peak days or during peak hours; (2) pedestrian use of the facility is not expected to be more than occasional; (3) there will be good horizontal and vertical alignment providing safe and frequent passing opportunities; and (4) the path will not be subject to maintenance vehicle loading conditions that would cause pavement edge damage. Under certain conditions, it may be necessary or desirable to increase the width of bicycle path to 12 feet or more, for example, because of substantial bicycle volume, probable shared use with joggers and other pedestrians, use by large maintenance vehicles, steep grades, or where bicycles will be likely to ride two abreast.

Reduced widths are acceptable on access pathways due to their generally short length and low volumes. However, wherever possible, minimum width standards should be employed. One-directional bicycle facilities are not generally recommended since they will almost certainly be used as two-way facilities.

A minimum of a two foot wide graded area should be maintained adjacent to both sides of the pavement. However, three feet or more is desirable to provide clearance from trees, poles, walls, fences, guardrails, or other lateral guidelines. A wider graded area on either side of the bicycle path can also serve as a separate jogging or equestrian path. Vertical clearance from obstructions should be a minimum of eight feet. However, greater vertical clearance may needed to permit maintenance vehicle passage and, in undercrossings and tunnels, a clearance of 10 feet is desirable for adequate vertical shy distance.

6.4.2 Horizontal Separation from Roadways

Class 1 bicycle facilities are generally physically separated from roadways. However, where a Class 1 facility must be considered within a roadway right-of-way, a wide separation between a bicycle path and adjacent highway is desirable to confirm for both the cyclist and the motorist that the bicycle path functions as an independent highway for bicycle traffic. In addition to physical separation, landscaping or other visual buffer is desirable. When this is not possible and the distance between the edge of the roadway and the bicycle path is

less than five feet, a suitable physical divider may be considered. Such dividers serve both to prevent cyclists from making unwanted movements between the path and the highway shoulder for the protection of cyclists from motor vehicles and to reinforce the concept that the bicycle path is an independent facility. Where used, the divider should be a minimum of 4.5 feet high to prevent cyclists from toppling over it and it should be designed so that it does not become an obstruction or traffic hazard in itself.

6.4.3 Design Speed

The speed that a cyclist travels is dependent on several factors, including the type and condition of the bicycle, the purpose of the trip, the condition and location of the bicycle path, the speed and direction of the wind and the physical condition of the cyclist. Bicycle paths should be designed for a selected speed that is at least as high as the preferred speed of the faster cyclists. In general, a minimum design speed of 20 m.p.h. should be used. However, when the grade exceeds four percent, a design speed of 30 m.p.h. is advisable.

On unpaved paths, where cyclists tend to ride slower, a lower design speed of 15 m.p.h. can be used. Similarly, where the grades dictate, a higher design speed of 25 m.p.h. can be used. Since bicycles have a higher tendency to skid on unpaved surfaces, horizontal curvature design should take into account lower coefficients of friction.

6.4.4 Horizontal Alignment and Superelevation

The minimum radius of curvature negotiable by a bicycle is a function of the superelevation rate of the bicycle path surface, the coefficient of friction between the bicycle tires and the bicycle path surface and the speed of the bicycle. The minimum design radius of curvature can be derived from the following formula:

$$R = \frac{V^2}{127\left(\frac{e}{100} + f\right)}$$

R = Minimum radius of curvature (meters)
V= Design speed (k.p.h.)
e = Rate of superelevation
f = Coefficient of friction

For most bicycle path applications, the superelevation rate will vary from a minimum of two percent (the minimum necessary to encourage adequate drainage) to a maximum of approximately five percent (beyond which maneuvering difficulties by slow bicycles and adult tricyclists might be expected). The minimum superelevation rate of two percent will be adequate for most conditions and will simplify construction.

The coefficient of friction depends upon speed; surface type, roughness and condition; tire type and condition; and whether the surface is wet or dry. Friction factors used for design should be selected based upon the point at which centrifugal force causes the cyclist to recognize a feeling of discomfort and instinctively act to avoid higher speed. Extrapolating from values used in highway design, design factors for paved bicycle paths can be assumed to vary from 0.30 at 15 m.p.h. to 0.22 at 30 m.p.h. Based on a superelevation rate (e) of two percent, minimum radii of curvature can be selected from Figure 1003.1C of the Caltrans *Highway Design Manual.*

When substandard radius curves must be used on bicycle paths because of right-of-way, topography, or other considerations, standard curve warning signs and supplemental pavement markings should be installed in accordance with the Caltrans *Highway Design Manual.* The negative effects of substandard curves can also be partially offset by widening the pavement through the curves.

6.4.5 Grade

Grades on bicycle paths should be kept to a minimum, especially on long inclines. Grades

greater than five percent are undesirable because the ascents are difficult for many cyclists and the descents cause some cyclists to exceed the speeds at which they are competent. Where terrain dictates, grades over five percent and less than 500 feet long are acceptable when a higher design speed is used and additional width is provided.

6.4.6 Switchbacks

In areas of steep terrain, a series of "switchbacks" may be the only solution to traversing changes in elevation. At these locations, a grade of eight percent is acceptable for a distance of no more than 100 feet. Where applicable, grades steeper than eight percent will not meet Americans with Disabilities Act (ADA) standards. Switchback radii should be larger than normally employed for pedestrian facilities to allow for cyclists to be able to safely make the turns without having to dismount. Pavement width should be a minimum of 12 feet wide to allow ascending cyclists room to walk their bicycles when necessary. The switchbacks should be completely visible from the next uphill turn. Runouts at the end of each turn should be considered for cyclists unable to slow down quickly enough to make the turn. Railings may installed to discourage shortcuts and appropriate signing should be placed at the top of the descent.

6.4.7 Sight Distances

To provide cyclists with an opportunity to see and react to the unexpected, a bicycle path should be designed with adequate stopping sight distance. The distance required to bring a bicycle to a full controlled stop is a function of the cyclist's perception and brake reaction time, the initial speed of the bicycle, the coefficient of friction between the tires and the pavement and the braking ability of the bicycle. Figure 1003.1D of the Caltrans *Highway Design Manual* indicates the minimum stopping sight distance for various design speeds and grades based on a coefficient of 0.25 to account for the poor wet weather braking characteristics of many bicycles. For two-way bicycle paths, the sight distance in descending direction, that is, where "G" is negative, will control the design.

6.4.8 Intersections

Intersections with roadways are important considerations in bicycle path design. If alternate locations for a bicycle path are available, the one with the most favorable intersection conditions should be selected. For crossings of freeways and other high-speed, high-volume arterials, a grade separation structure may be the only possible or practical treatment. Unless bicycles are prohibited from the crossing highway, providing for turning movements must be considered. When intersections occur at grade, a major consideration is the establishment of right-of-way. The type of traffic control (signal, stop sign, yield sign, etc.) to be used and locations should be provided in accordance with the Caltrans *Traffic Manual.*

Sign type, size and location should also be in accordance with the Caltrans *Traffic Manual.* Care should be taken to ensure that bicycle path signs are located so that motorists are not confused by them and that roadway signs are placed so that they do not confuse cyclists. Other means of alerting cyclists of a highway crossing include lateral deflections or small vertical deflections, as well as changing the paving surface at the approach. Devices installed to prohibit motorists from entering the bike path can also assist with alerting cyclists to crossings, but they must be well marked, including with reflective markings.

It is preferable that the crossing of a bicycle path and a highway be at a location away from the influence of intersections with other highways. Controlling vehicle movements at such intersections is more easily and safely accomplished through the application of standard traffic control devices and normal "Rules of the Road." Where physical constraints prohibit such independent intersections, the crossings may be at or adjacent to the pedestrian crossing. Right-of-way should be assigned and sight distance should be provided so as to minimize the potential for conflict resulting from unconventional turning movements. At crossings of high volume multi-lane arterial highways where signals are not warranted, consideration should be given to providing a median refuge area for cyclists.

The entrances to Class 1 paths can sometimes create crossing conflicts. Methods to resolve this include signalized striped crosswalks with pedestrian push-buttons, bicycle loop detectors and pavement logos, bicycle signal heads, in-pavement flashing lights at unsignalized intersections, and various traffic calming techniques. Bollards should also be placed at the entrance to the path to keep vehicles from entering.

When bicycle paths terminate at existing roads, it is important to integrate the path into the existing system of roadways. Care should be taken to properly design the terminals to transition the traffic into a safe merging or diverging situation. Appropriate signing is necessary to warn and direct both cyclists and motorists regarding these transition areas.

Bicycle path intersections and approaches should be on relatively flat grades. Stopping sight distances at intersections should be checked and adequate warning should be given to permit cyclists to stop before reaching the intersection, especially on downgrades.

Ramps for curb cuts at intersections should be the same width as the bicycle paths. Curb cuts and ramps should provide a smooth transition between the bicycle paths and the roadway.

6.4.9 Signing and Marking

Adequate signing and marking are essential on bicycle paths, especially to alert cyclists to potential conflicts and to convey regulatory messages to both cyclists and motorists at highway intersections. In addition, guide signing, such as to indicate directions, destinations, distance, route numbers and names of crossing streets, should be used in the same manner as they are used on highways. In general, uniform application of traffic control devices, as described in the Caltrans Highway *Design and Traffic Manuals*, will tend to encourage proper cyclist behavior.

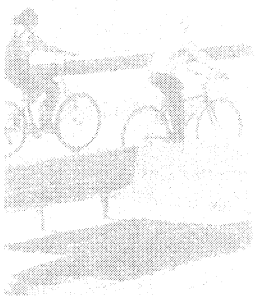
A designer should consider a four-inch wide yellow centerline stripe to separate opposite directions of travel if heavy volumes of bicycles are expected, on curves with restricted sight distances; and on unlighted paths where nighttime riding is expected. Edge lines can also be very beneficial where significant nighttime bicycle traffic is expected.

General guidance on signing and marking is provided in the Caltrans *Highway Design Manual*. Care should be exercised in the choice of pavement marking materials. Some marking materials are slippery when wet and should be avoided in favor of more skid-resistant materials.

6.4.10 Pavement Structure

Under most circumstances, a two-inch thick asphalt top course placed on a six-inch thick select granular sub-base is suitable for a bikeway pavement structure. Where unsatisfactory soils can be anticipated, a soil investigation should be conducted to determine the load-carrying capabilities of the native soil and the need for any special provisions.

In addition, some basic differences between the operating characteristics of bicycles and those of motor vehicles should be recognized. While loads on bicycle paths will be substantially less that typical roadway loads, paths should be designed to sustain without damage the wheel loads of occasional emergency, patrol, maintenance and other motor vehicles that are expected to use or cross the path. Where such motor vehicle use will be required, four inches of asphalt should be used. Additional pavement structure may also be necessary in flood plains and in locations where shallow root systems may heave thin pavement sections.



Special consideration should be given to the location of motor vehicle wheel loads on the path. When motor vehicles are driven on bicycle paths, their wheels will usually be at or very

near the edges of the path. Since this can cause edge damage that, in turn, will result in the lowering of the effective operating width of the path, adequate edge support should be provided. Edge support can be either in the form of stabilized shoulders or in constructing additional pavement width. Constructing a typical pavement width of 12 feet, where right-of-way and other conditions permit, eliminates the edge-raveling problem and offers two other additional advantages over shoulder construction. First, it allows additional maneuvering space for cyclists and second, the additional construction cost can be less than that for constructing shoulders because the separate construction operation is eliminated.

It is important to construct and maintain a smooth riding surface on bicycle paths. Bicycle path pavements should be machine laid. Root barriers should be used where necessary to prevent vegetation from rupturing the pavement over time, and on Portland cement concrete pavements, transverse joints, necessary to control cracking, should be saw cut to provide a smooth ride. On the other hand, skid resistance qualities should not be sacrificed for the sake of smoothness. Broom finish or burlap drag concrete surfaces are preferred over trowel finishes, for example.

At unpaved highway or driveway crossings of bicycle paths, the highway or driveway should be paved a minimum of 10 feet on each side of the crossing to reduce the amount of gravel being scattered along the path by motor vehicles. The pavement structure at the crossing should be adequate to sustain the expected loading at the location.

6.4.11 Structures

An overpass, underpass, small bridge, drainage facility or facility on a highway bridge may be necessary to provide continuity to a bicycle path. On new structures, the minimum clear width should be the same as the approach paved bicycle path and the desirable clear width should include the minimum two-foot wide clear areas. Carrying the clear areas across the structures has two advantages. First, it provides a minimum horizontal shy distance from the railing or barrier, and second, it provides needed maneuvering space to avoid conflicts with pedestrians and other cyclists who are stopped on the bridge. Access by emergency, patrol and maintenance vehicles should be considered in establishing the design clearances of structures on bicycle paths. Similarly, vertical clearance may be dictated by occasional motor vehicles using the path. Where practical, a vertical clearance of 10 feet is desirable for adequate vertical shy distance.

Railings, fences, or barriers on both sides of a bicycle path structure should be a minimum of 4.5 feet high. Smooth rub rails should be attached to the barriers at handlebar height of 3.5 feet.

Bridges designed exclusively for bicycle traffic may be designed for pedestrian live loading. On all bridge decks, special care should be taken to ensure that bicycle safe expansion joints are used.

Where it is necessary to retrofit a bicycle path onto an existing highway bridge, several alternatives should be considered in light of what the geometrics of the bridge will allow.

One option is to carry the bicycle path across the bridge on one side. This should be done where the bridge facility will connect to a bicycle path at both ends, sufficient width exists on that side of the bridge, or can be obtained by widening or re-striping lanes; and provisions are made to physically separate bicycle traffic from motor vehicle traffic as discussed above.

A second option is to provide either wide curb lanes or bicycle lanes over the bridge. This may be advisable where the bicycle path transitions into bicycle lanes at one end of the bridge; and sufficient width exists, or can be obtained by widening or re-striping.

A third option is to use existing sidewalks as one-way or two-way facilities. This may be advisable where conflicts between cyclists and pedestrians will not exceed tolerable limits,

and the existing sidewalks are adequately wide. Under certain conditions, the cyclist may be required to dismount and cross the structure as a pedestrian.

Because of the large number of variables involved in retrofitting bicycle facilities onto existing bridges, compromises in desirable design criteria are often inevitable. Therefore, the width to be provided is best determined by the designer, on a case-by-case basis, after thoroughly considering all the variables.

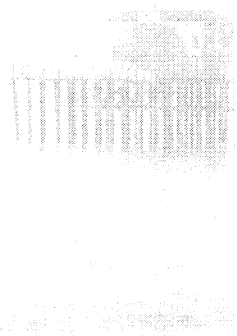
6.4.12 Drainage

The recommended minimum pavement cross slope of two percent adequately provides for drainage. Sloping in one direction instead of crowning is preferred and usually simplifies the drainage and surface construction. A smooth surface is essential to prevent water ponding and ice formation.

Where a bicycle path is constructed on the side of a hill, a ditch of suitable dimensions should be placed on the uphill side to intercept the hillside drainage. Such ditches should be designed in such a way that no undue obstacles are presented to cyclists. Where necessary, catch basins with drains should be provided to carry the intercepted water under the path. Drainage grates and manhole covers should be located outside of the travel path of the cyclist. (See Section 1003.6 of the Caltrans *Highway Design Manual.*) To assist in draining the area adjacent to the bicycle path, the design should include considerations for preserving the natural ground cover. Seeding, mulching and sodding of adjacent slopes, swales and other erosion-prone areas should be included in the design plans.

6.4.13 Lighting

Lighting is encouraged for both guidance and safety reasons and should be considered along Class 1 paths especially if heavy use is expected in the evening hours. Applicable situations include bicycle paths serving colleges or employment centers, as well as at highway intersections. Lighting should also be considered through underpasses or tunnels and when nighttime security could be a problem. Fixed-source lighting reduces conflicts along the paths and at intersections. In addition, lighting allows the cyclist to see the bicycle path direction, surface conditions and obstacles.

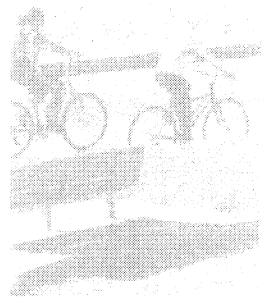


Depending on the location, average maintained horizontal illumination levels of 5 to 22 lux should be considered. Light standards (poles) should meet the recommended horizontal and vertical clearances. Luminaires and standards should be at a scale appropriate for a pedestrian or bicycle path. (See Section 1003.6 of the Caltrans *Highway Design Manual.*)

6.4.14 Barriers to Motor Vehicle Traffic

Bicycle paths often need some type of physical barrier at highway intersections and pedestrian-load bridges to prevent unauthorized motor vehicles from using the facilities. Provisions can be made for a lockable, removable post to permit entrance by authorized vehicles. The post should be permanently reflectorized for nighttime visibility and painted a bright color for improved daytime visibility. When more than one post is used, a five foot spacing is desirable. Wider spacing can allow entry to motor vehicles, while narrower spacing might prevent entry by adult tricycles and bicycles with trailers. Striping an envelope around the barrier is recommended. (See Section 1003.1 of the Caltrans *Highway Design Manual.*)

An alternate method of restricting entry of motor vehicles is to split the entryway into two five-foot sections separated by low landscaping. Emergency vehicles can still enter if necessary by straddling the landscape. The maintenance costs associated with landscaping should be acknowledged, however, before this alternative method is selected.



6.5 Unpaved Multi-Use Facilities

In some cases, unpaved trails or roads may be used as part of a bikeway system. Though not eligible for official designation as bicycle facilities, they can be acknowledged as "informal" unpaved connections between official paved segments. Because these routes are

generally in less developed areas, they may also be considered scenic unpaved "byways" that can be accessed via the official bikeway system.

Many of the bicycles sold are mountain bikes designed for use on unpaved surfaces and come equipped with wide tires and low gearing. Many recreational cyclists ride this type of bicycle and may use them on a well maintained unpaved route. Unpaved routes are unlikely to attract many commuting cyclists, but the routes may experience some utility use if they provide convenient shortcuts between popular destinations where such routes would not otherwise exist.

Available guidelines for unpaved facilities are limited. In general, the coefficient of friction used in calculating curve radii and a factor in determining design speed, should be reduced. Although there are not data available for unpaved surfaces, it is suggested that friction factors be reduced by 50 percent to allow a sufficient margin of safety. This reduction in friction affects all situations where traction is important, especially on grades. Grades steeper than three percent may not be practical for bicycle paths with crushed stone surfaces.

In cases where switchbacks are necessary for unpaved paths that occur in steep terrain, curve radii may be enlarged, the path widened and runout areas provided. In areas of erosive soils, it is also advisable to install signage suggesting cyclists dismount when traversing the switchbacks.

6.6 Class 2 Facilities

Class 2 facilities are marked bicycle lanes within roadways usually adjacent to the curb lane, delineated by appropriate striping and signage.

Bicycle lanes can be considered when it is desirable to delineate available road space for preferential use by cyclists and motorists and to provide for more predictable movements by each. Bicycle lane markings can increase a cyclist's confidence in motorists not straying into his/her path of travel. Likewise, passing motorists are less likely to swerve to the left out of their lane to avoid cyclists on their right.

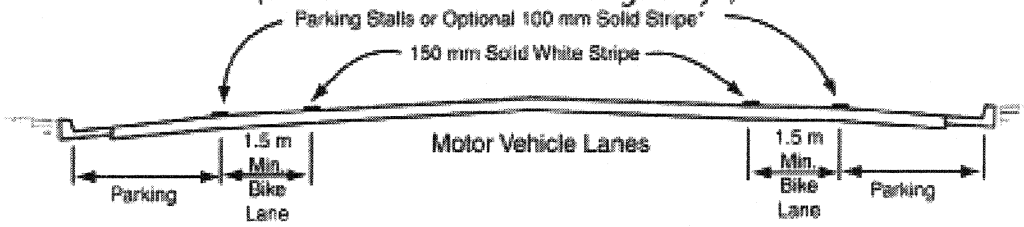
Bicycle lanes should always be one-way facilities and carry traffic in the same direction as adjacent motor vehicle traffic. Two-way bicycle lanes on one side of the roadway are unacceptable because they promote riding against the flow of motor vehicle traffic. Wrong-way riding is the primary cause of bicycle crashes and violates the "Rules of the Road" stated in the Uniform Vehicle Code. Bicycle lanes on one-way streets should be on the right side of the street, except in areas where a bicycle lane on the left will decrease the number of conflicts (e.g., those caused by heavy bus traffic). In unique situations, it may be appropriate to provide a contra-flow bicycle lane on the left side of a one-way street. Where this occurs, the lane should be marked with a solid, double yellow line and the width of the lane should be increased by one foot.

6.6.1 Lane Widths

Under ideal conditions, the minimum bicycle lane width is five feet. However, certain edge conditions dictate additional desirable bicycle lane width. Figure 1003.2A from the Caltrans *Highway Design Manual*, on the following page, depicts four common dimensions for such facilities and their relations to the roadway.

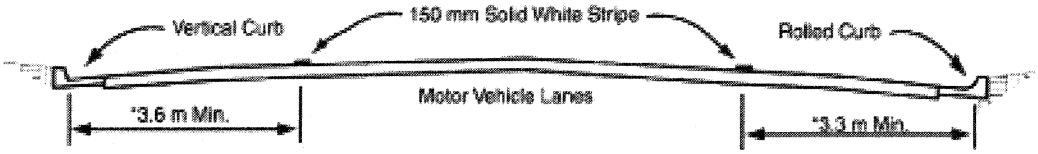
The first configuration depicts bicycle lanes on an urban curbed street where a striped parking lane is provided. The minimum bicycle lane width for this location is five feet. If parking volume is substantial or turnover is high, an additional one or two feet of width is desirable for safe bicycle operation. Bicycle lanes should always be placed between the parking lane and the motor vehicle lanes. Bicycle lanes between the curb and the parking lane can create obstacles for cyclists and eliminate a cyclist's ability to avoid a car door as it is opened. Therefore, this placement should not be considered.

Figure 1003.2A
Typical Bike Lane Cross Sections
(On 2-lane or Multilane Highways)



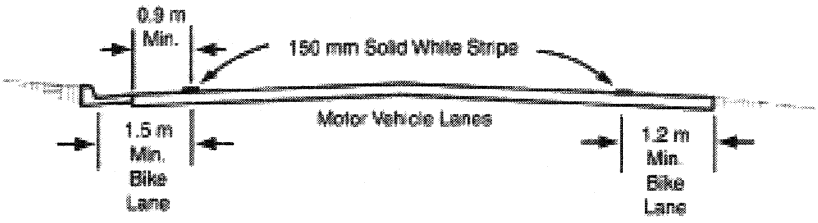
*The optional solid white stripe may be advisable where stalls are unnecessary (because parking is light) but there is concern that motorists may misconstrue the bike lane to be a traffic lane.

(1) STRIPED PARKING

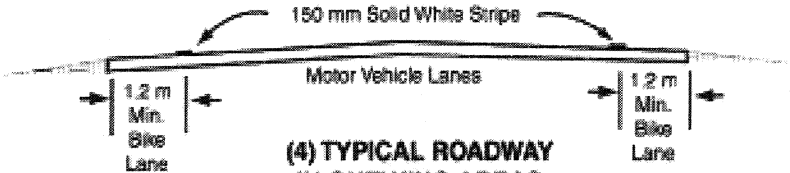


* 3.9 is recommended where there is substantial parking or turnover of parked cars is high (e.g. commerical areas).

(2) PARKING PERMITTED WITHOUT PARKING STRIPE OR STALL



(With Gutter) **(3) PARKING PROHIBITED** (Without Gutter)



(4) TYPICAL ROADWAY IN OUTLYING AREAS PARKING RESTRICTED

The second configuration depicts an urban curbed street where parking is allowed, but without striping for a separate bike lane. This parking lane shared with bicycles should be 11 to 12 feet wide. 13 feet is recommended where parking turnover is high, such as commercial districts. Cyclists do not generally ride near a curb because of the possibility of debris, of hitting a pedal on the curb, of an uneven longitudinal joint, or of a steeper cross slope.

The third configuration of Figure 1003.2A shows a roadway where parking is prohibited. Bicycle lanes in this location should have a minimum width of five feet where a curb occurs (measured from the curb face) and four feet where no curb is used. If the longitudinal joint between the gutter pan and the roadway surface is uneven and falls within five feet of the curb face, a minimum of four feet should be provided between the joint and the motor vehicle lanes.

The fourth configuration of Figure 1003.2A depicts bicycle lanes on a roadway where parking is prohibited and without curbs. Bicycle lanes should be located between the motor vehicle lanes and the roadway shoulders. In this situation, bicycle lanes may have a minimum width of four feet, since the shoulder can provide additional maneuvering width. A width of five feet or greater is preferable. Additional widths are desirable where substantial truck traffic is present, or where vehicle speeds exceed 40 m.p.h. In certain situations, it may be appropriate to designate the full shoulder as the bike lane.

6.6.2 Intersections

Bicycle lanes tend to complicate both bicycle and motor vehicle turning movements at intersections. Because they encourage cyclists to keep to the right and motorists to keep to the left, both operators are somewhat discouraged from merging in advance of turns. Because of this, some cyclists will begin left turns from the right side of the bicycle lane and some motorists will begin right turns from the left side of the bicycle lane. Both maneuvers are contrary to established "Rules of the Road" and result in conflicts.

Design treatment for bicycle lanes at a simple intersection is shown in Figure 1003.2B of the Caltrans *Highway Design Manual*. On a two-lane roadway, the edge line along the bike lane should end approximately 200 feet from the intersection to allow left turning cyclists and right turning motorists to "weave" as needed to safely complete their turns.

Design treatment at multi-lane intersections is more complex. Figure 1003.2C of the Caltrans *Highway Design Manual* presents examples of pavement markings for bicycle lanes approaching motorist right-turn-only lanes. Where there is numerous left turning cyclists, a separate turning lane should be considered.

The design of bicycle lanes should also include appropriate signing at intersections to reduce the number of conflicts. General guidance for pavement marking of bicycle lanes is contained in Section 1003.2 of the Caltrans *Highway Design Manual*. (See the Caltrans *Traffic Manual* for additional information.)

6.6.3 Signing and Striping Requirements

Signing and striping should be in accordance with Section 1004 of the Caltrans *Highway Design Manual* and the Caltrans *Traffic Manual*. Bicycle lanes should be well marked and signed to ensure clear understanding of the presence and purpose of the facility by both cyclists and motorists. The Caltrans *Traffic Manual* also specifies standard signing for bicycle lanes. The appropriate signs should be used in advance of the beginning of a marked designated bicycle lane to call attention to the lane and to the possible presence of cyclists. Signs should be used only in conjunction with the appropriate pavement marking and erected at periodic intervals along the designated bicycle lane and in the vicinity of locations where the preferential lane symbol is used.

Where it is necessary to restrict parking, standing, or stopping in a designated bicycle lane, appropriate signs, as described in the Caltrans *Traffic Manual*, may be used. For example,

some cities employ a combination "NO PARKING/BIKE LANE" sign, especially where frequent stopping is a problem.

Bicycle lane stripes should be solid, six to eight inch wide white lines. Care should be taken to use skid-resistant pavement striping. Thermoplastic tape and painted markings can become slippery and cause the cyclist to fall. Impregnated grit, nonskid, preformed tape is an acceptable striping material.

It is very important to reapply bicycle lane markings when they begin to fade, since faded bicycle lane markings can lead to confusion for motorists and cyclists. If necessary, reapplication of bicycle lane stripes should be placed on a more frequent schedule than regular roadway re-striping projects. Old markings should be removed prior to re-striping if new layers of marking materials would otherwise create raised areas that would be hazardous to cyclists.

Prompt replacement of bicycle lane striping following pavement repairs should be the responsibility of the paving contractor for projects that have required the removal and replacement of bike lane paving. Too often, lane striping is not replaced following construction or repaving projects.

Preferential bicycle lane symbols should be installed on the pavement in bicycle lanes. Symbols should be installed at regular intervals (no more that 350 feet between symbols), immediately after intersections and at areas where bicycle lanes begin. Pavement letters that spell "BIKE ONLY," and arrows are optional, but desirable. (See Figure 1004.4 of the Caltrans *Highway Design Manual.*)

6.6.4 Miscellaneous Bikeway Criteria

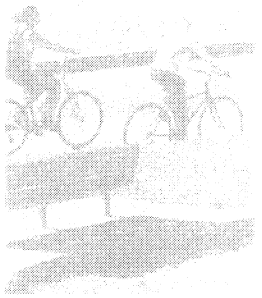
In addition to adequate pavement surface and traffic signals responsive to bicycles, bicycle-safe grate inlets and safe railroad crossings should always be provided on roadways where bicycle lanes are being designated.

Bicycle-safe Grate Inlets

Drainage inlet grates should be maintained flush with the surface. Drainage inlet grates on bikeways openings must be narrow enough and short enough to prevent bicycle tires from dropping into the grates, regardless of the direction of bicycle travel. The Caltrans *Highway Design Manual* states; "Where it is not immediately feasible to replace existing grates with standard grates designed for bicycles...steel cross straps should be welded to the grates ...to reduce the size of the openings."

Grates with slots parallel to expected bicycle travel only should never be used. Most bicycle-safe grate inlets currently in use have vertical slats perpendicular to the roadway spaced roughly two inches apart. Some safe designs have more widely spaced slats angled to improve hydraulic flow. Other effective grate designs employ honeycomb or herringbone hole patterns, including a design approved by Caltrans.

Curb-face inlets take the water into a hole in the curb and have no slots on the road surface. While curb-face inlets offer an excellent solution, removing the grate entirely, they can cause handling problems for bikes if the roadway slopes excessively toward the inlet.



Safe Rail Crossings

Safe rail crossings eliminate the gaps along the rails with flangeway fillers and are aligned so that cyclists are directed to cross the tracks at a perpendicular angle to avoid slipping on the smooth metal that can occur when crossing at an oblique angle. (See Section 1003.6 of the Caltrans *Highway Design Manual.*)

Raised Pavement Markings and Barriers

Raised pavement markings and raised barriers can cause steering difficulties for cyclists

and should not be used to delineate bicycle lanes.

6.7 Class 3 Facilities

A Class 3 facility is a suggested bicycle route that usually consists of a series of signs designating a preferred route between destinations such as residential and shopping areas. A network of such routes can provide access to a number of destinations throughout the community. In some cases, looped systems of scenic routes have been created to provide users with a series of recreational experiences. In addition, such routes can provide relatively safe connections for commuting to workplaces or schools.

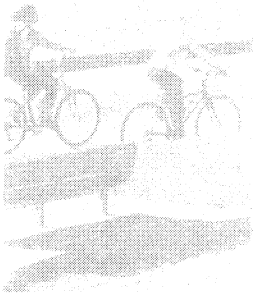
The designation of a roadway as a Class 3 facility should be based primarily on the advisability of encouraging bicycle use on that particular roadway. While the roadways chosen for bicycle routes may not be free of problems, they should offer the best balance of safety and convenience of the available alternatives. In general, the most important considerations are pavement width and geometrics, traffic conditions and appropriateness of the intended purpose. A certain amount of risk and liability exists for any area that is signed as a Class 3 route. The message to the user public is that the facility is a safe route. Therefore, routes should not be placed on streets that do not meet appropriate safety standards.

Attributes that describe how appropriate a particular road is for a bicycle route include directness, connectivity with other bicycle facilities, scenery and available services. Directness is important for cyclists traveling for a purpose, such as commuting, though this is not the case for recreational riders, for whom scenery may be the primary factor in selecting a route. For recreational riders traveling more than a few miles, services such as food, water, restrooms and pressurized air may be of interest.

6.7.1 Roadway Engineering

While design of all Class 1 and 2 bikeways should follow the Bikeway Planning and Design Chapter 1000 of Caltrans' *Highway Design and Traffic Manuals*, there are bound to be situations where the recommended geometrics for a Class 3 facility can not be achieved, such as due to right-of-way constraints, for example. Planning and design of the Class 3 facility should emphasize safety for cyclists and provide additional warnings to motorists to be aware of the presence of cyclists.

SHARE
THE
ROAD



Appendix A: Caltrans Highway Design Manual - Chapter 1000 - Bikeway Planning and Design

The following pages from the Caltrans *Highway Design Manual* are included as a reference for physical design requirements for bikeways in the State of California.

CHAPTER 1000
BIKEWAY PLANNING AND DESIGN

Topic 1001 - General Criteria

Index 1001.1 - Introduction

The needs of non-motorized transportation are an essential part of all highway projects. Topic 105 discusses Pedestrian Facilities with Index 105.3 addressing accessibility needs. This chapter discusses bicycle travel. All city, county, regional and other local agencies responsible for bikeways or roads where bicycle travel is permitted must follow the minimum bicycle planning and design criteria contained in this and other chapters of this manual (See Streets and Highways Code Section 891).

Bicycle travel can be enhanced by improved maintenance and by upgrading existing roads used regularly by bicyclists, regardless of whether or not bikeways are designated. This effort requires increased attention to the right-hand portion of roadways where bicyclists are expected to ride. On new construction, and major reconstruction projects, adequate width should be provided to permit shared use by motorists and bicyclists. On resurfacing projects, it is important to provide a uniform surface for bicyclists and pedestrians. See Index 625.1(1) and 635.1(1) for guidance in accommodating bicyclist and pedestrian needs on resurfacing projects. **When adding lanes or turn pockets, a minimum 1.2 m shoulder shall be provided (see Topic 405 and Table 302.1).** When feasible, a wider shoulder should be considered. When placing a roadway edge line, sufficient room outside the line should be provided for bicyclists. When considering the restriping of roadways for more traffic lanes, the impact on bicycle travel should be assessed. Bicycle and pedestrian traffic through construction zones should be addressed in the project development process. These efforts, to preserve or improve an area for use by bicyclists, can enhance motorist and bicyclist safety and mobility.

1001.2 The Role of Bikeways

Bikeways are one element of an effort to improve bicycling safety and convenience - either to help accommodate motor vehicle and bicycle traffic on shared roadways, or to complement the road system to meet needs not adequately met by roads.

Off-street bikeways in exclusive corridors can be effective in providing new recreational opportunities, or in some instances, desirable commuter routes. They can also be used to close gaps where barriers exist to bicycle travel (e.g., river crossing). On-street bikeways can serve to enhance safety and convenience, especially if other commitments are made in conjunction with establishment of bikeways, such as: elimination of parking or increasing roadway width, elimination of surface irregularities and roadway obstacles, frequent street sweeping, establishing intersection priority on the bike route street as compared with the majority of cross streets, and installation of bicycle-sensitive loop detectors at signalized intersections.

1001.3 The Decision to Develop Bikeways

The decision to develop bikeways should be made with the knowledge that bikeways are not the solution to all bicycle-related problems. Many of the common problems are related to improper bicyclist and motorist behavior and can only be corrected through effective education and enforcement programs. The development of well conceived bikeways can have a positive effect on bicyclist and motorist behavior. Conversely, poorly conceived bikeways can be counterproductive to education and enforcement programs.

1001.4 Definitions

The Streets and Highway Code Section 890.4 defines a "Bikeway" as a facility that is provided primarily for bicycle travel.

(1) Class I Bikeway (Bike Path). Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with crossflow by motorists minimized.

(2) Class II Bikeway (Bike Lane). Provides a striped lane for one-way bike travel on a street or highway.

(3) Class III Bikeway (Bike Route). Provides for shared use with pedestrian or motor vehicle traffic.

1001.5 Streets and Highways Code References - Chapter 8 - Nonmotorized Transportation

(a) Section 887 -- Definition of nonmotorized facility.

(b) Section 887.6 -- Agreements with local agencies to construct and maintain nonmotorized facilities.

(c) Section 887.8 -- Payment for construction and maintenance of nonmotorized facilities approximately paralleling State highways.

(d) Section 888 -- Severance of existing major nonmotorized route by freeway construction.

(e) Section 888.2 -- Incorporation of non-motorized facilities in the design of freeways.

(f) Section 888.4 -- Requires Caltrans to budget not less than $360,000 annually for nonmotorized facilities used in conjunction with the State highway system.

(g) Section 890.4 -- Class I, II, and III bikeway definitions.

(h) Section 890.6 - 890.8 -- Caltrans and local agencies to develop design criteria and symbols for signs, markers, and traffic control devices for bikeways and roadways where bicycle travel is permitted.

(i) Section 891 -- Local agencies must comply with design criteria and uniform symbols.

(j) Section 892 -- Use of abandoned right-of-way as a nonmotorized facility.

1001.6 Vehicle Code References - Bicycle Operation

(a) Section 21200 -- Bicyclist's rights and responsibilities for traveling on highways.

(b) Section 21202 -- Bicyclist's position on roadways when traveling slower than the normal traffic speed.

(c) Section 21206 -- Allows local agencies to regulate operation of bicycles on pedestrian or bicycle facilities.

(d) Section 21207 -- Allows local agencies to establish bike lanes on non-state highways.

(e) Section 21207.5 -- Prohibits motorized bicycles on bike paths or bike lanes.

(f) Section 21208 -- Specifies permitted movements by bicyclists from bike lanes.

(g) Section 21209 -- Specifies permitted movements by motorists in bike lanes.

(h) Section 21210 -- Prohibits bicycle parking on sidewalks unless pedestrians have an adequate path.

(i) Section 21211 -- Prohibits impeding or obstruction of bicyclists on bike paths.

(j) Section 21717 -- Requires a motorist to drive in a bike lane prior to making a turn.

(k) Section 21960 -- Use of freeways by bicyclists.

Topic 1002 - Bikeway Facilities

1002.1 Selection of the Type of Facility

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

(1) Shared Roadway (No Bikeway Designation). Most bicycle travel in the State now occurs on streets and highways without bikeway designations. This probably will be true in the future as well. In some instances, entire street systems may be fully adequate for safe and efficient bicycle travel, and signing and

pavement marking for bicycle use may be unnecessary. In other cases, prior to designation as a bikeway, routes may need improvements for bicycle travel.

Many rural highways are used by touring bicyclists for intercity and recreational travel. It might be inappropriate to designate the highways as bikeways because of the limited use and the lack of continuity with other bike routes. However, the development and maintenance of 1.2 m paved roadway shoulders with a standard 100 mm edge line can significantly improve the safety and convenience for bicyclists and motorists along such routes.

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

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

If bicycle travel is to be controlled by delineation, special efforts should be made to assure that high levels of service are provided with these lanes.

In selecting appropriate streets for bike lanes, location criteria discussed in the next section should be considered.

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

(a) Provide continuity to other bicycle facilities (usually Class II bikeways); or

(b) Designate preferred routes through high demand corridors.

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

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

In selecting the proper facility, an overriding concern is to assure that the proposed facility will not encourage or require bicyclists or

motorists to operate in a manner that is inconsistent with the rules of the road.

An important consideration in selecting the type of facility is continuity. Alternating segments of Class I and Class II (or Class III) bikeways along a route are generally incompatible, as street crossings by bicyclists are required when the route changes character. Also, wrong-way bicycle travel will occur on the street beyond the ends of bike paths because of the inconvenience of having to cross the street.

Topic 1003 - Design Criteria

1003.1 Class I Bikeways

Class I bikeways (bike paths) are facilities with exclusive right of way, with cross flows by motorists minimized. Section 890.4 of the Streets and Highways Code describes Class I bikeways as serving "the exclusive use of bicycles and pedestrians". However, experience has shown that if significant pedestrian use is anticipated, separate facilities for pedestrians are necessary to minimize conflicts. Dual use by pedestrians and bicycles is undesirable, and the two should be separated wherever possible.

Sidewalk facilities are not considered Class I facilities because they are primarily intended to serve pedestrians, generally cannot meet the design standards for Class I bikeways, and do not minimize motorist cross flows. See Index 1003.3 for discussion relative to sidewalk bikeways.

By State law, motorized bicycles ("mopeds") are prohibited on bike paths unless authorized by ordinance or approval of the agency having jurisdiction over the path. Likewise, all motor vehicles are prohibited from bike paths. These prohibitions can be strengthened by signing.

(1) Widths. **The minimum paved width for a two-way bike path shall be 2.4 m. The minimum paved width for a one-way bike path shall be 1.5 m. A minimum 0.6 m wide graded area shall be provided adjacent to the pavement (see Figure 1003.1A).** A 1.0 m graded area is recommended to provide clearance from poles, trees, walls, fences, guardrails, or other lateral obstructions. A wider graded area can also serve as a jogging path. Where the paved width is wider than the minimum required, the graded area may be reduced accordingly; however, the graded area is a desirable feature regardless of the paved width. Development of a one-way bike path should be undertaken only after careful consideration due to the problems of enforcing one-way operation and the difficulties in maintaining a path of restricted width.

Where heavy bicycle volumes are anticipated and/or significant pedestrian traffic is expected, the paved width of a two-way path should be greater than 2.4 m, preferably 3.6 m or more. Another important factor to consider in determining the appropriate width is that bicyclists will tend to ride side by side on bike paths, necessitating more width for safe use.

Experience has shown that paved paths less than 3.6 m wide sometimes break up along the edge as a result of loads from maintenance vehicles.

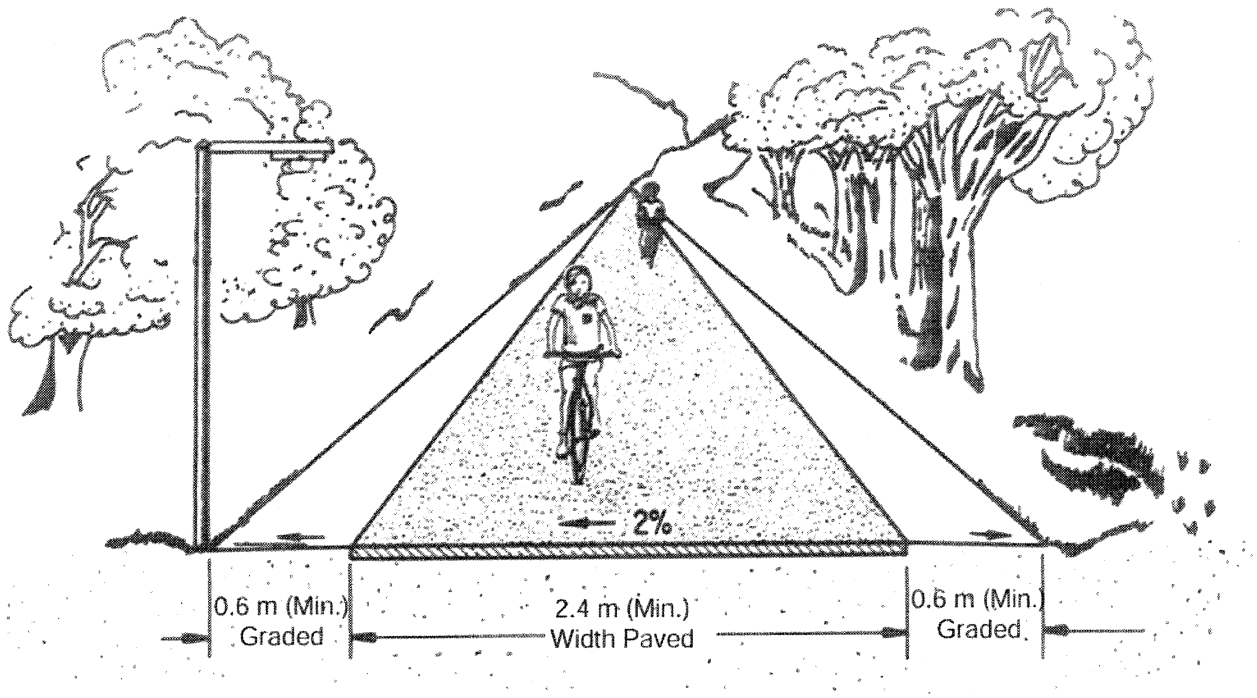
Where equestrians are expected, a separate facility should be provided.

(2) Clearance to Obstructions. **A minimum 0.6 m horizontal clearance to obstructions shall be provided adjacent to the pavement (see Figure 1003.1A).** A 1.0 m clearance is recommended. Where the paved width is wider than the minimum required, the clearance may be reduced accordingly; however, an adequate clearance is desirable regardless of the paved width. If a wide path is paved contiguous with a continuous fixed object (e.g., block wall), a 100 mm white edge line, 0.6 m from the fixed object, is recommended to minimize the likelihood of a bicyclist hitting it. **The clear width on structures between railings shall be not less than 2.4 m.** It is desirable that the clear width of structures be equal to the minimum clear width of the path (i.e., 3.6 m).

The vertical clearance to obstructions across the clear width of the path shall be a minimum of 2.5 m. Where practical, a vertical clearance of 3 m is desirable.

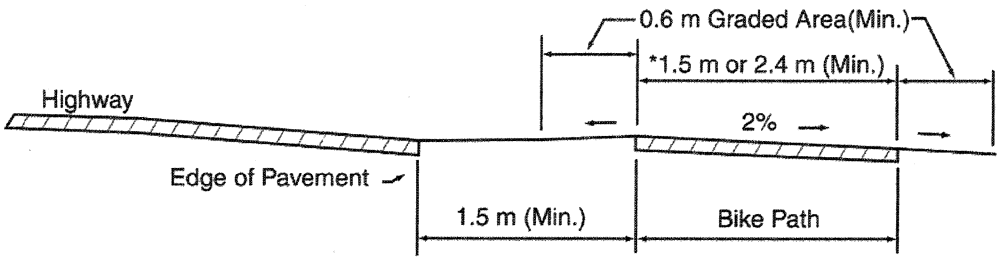
Figure 1003.1A

Two-Way Bike Path on Separate Right of Way



Note: For sign clearances, see MUTCD, Figure 9B-1.

Figure 1003.1B
Typical Cross Section of Bike Path Along HIghway



NOTE: See Index 1003.1(5)

*One - Way: 1.5 m Minimum Width
Two - Way: 2.4 m Minimum Width

(3) *Signing and Delineation.* For application and placement of signs, see the Manual on Uniform Traffic Control Devices (MUTCD), Section 9B.01 and the MUTCD and California Supplement Section 9B.01 and Figure 9B-101. For pavement marking guidance, see the MUTCD, Section 9C.03.

(4) *Intersections with Highways.* Intersections are a prime consideration in bike path design. If alternate locations for a bike path are available, the one with the most favorable intersection conditions should be selected.

Where motor vehicle cross traffic and bicycle traffic is heavy, grade separations are desirable to eliminate intersection conflicts. Where grade separations are not feasible, assignment of right of way by traffic signals should be considered. Where traffic is not heavy, stop or yield signs for bicyclists may suffice.

Bicycle path intersections and approaches should be on relatively flat grades. Stopping sight distances at intersections should be checked and adequate warning should be given to permit bicyclists to stop before reaching the intersection, especially on downgrades.

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

(5) *Separation Between Bike Paths and Highways.* A wide separation is recommended between bike paths and adjacent highways (see Figure 1003.1B). **Bike paths closer than 1.5 m from the edge of the shoulder shall include a physical barrier to prevent bicyclists from encroaching onto the highway. Bike paths within the clear recovery zone of freeways shall include a physical barrier separation.** Suitable barriers could include chain link fences or dense shrubs. Low barriers (e.g., dikes, raised traffic bars) next to a highway are not recommended because bicyclists could fall over them and into oncoming automobile traffic. In instances where there is danger of motorists encroaching into the bike path, a positive barrier (e.g., concrete barrier, steel guardrailing) should be provided. See Index 1003.6 for criteria relative to bike paths carried over highway bridges.

Bike paths immediately adjacent to streets and highways are not recommended. They should not be considered a substitute for the street, because many bicyclists will find it less convenient to ride on these types of facilities as compared with the streets, particularly for utility trips.

(6) *Bike Paths in the Median of Highways.* As a general rule, bike paths in the median of highways are not recommended because they require movements contrary to normal rules of the road. Specific problems with such facilities include:

(a) Bicyclist right turns from the center of roadways are unnatural for bicyclists and confusing to motorists.

(b) Proper bicyclist movements through intersections with signals are unclear.

(c) Left-turning motorists must cross one direction of motor vehicle traffic and two directions of bicycle traffic, which increases conflicts.

(d) Where intersections are infrequent, bicyclists will enter or exit bike paths at midblock.

(e) Where medians are landscaped, visual relationships between bicyclists and motorists at intersections are impaired.

For the above reasons, bike paths in the median of highways should be considered only when the above problems can be avoided. **Bike paths shall not be designed in the medians of freeways or expressways.**

(7) *Design Speed.* The proper design speed for a bike path is dependent on the expected type of use and on the terrain. **The minimum design speed for bike paths shall be 40 km/h except as noted in Table 1003.1.**

Table 1003.1

Bike Path Design Speeds

Type of Facility	Design Speed (km/h)
Bike Paths with Mopeds Prohibited	40
Bike Paths with Mopeds Permitted	50
Bike Paths on Long Downgrades (steeper than 4%, and longer than 150 m)	50

Installation of "speed bumps" or other similar surface obstructions, intended to cause bicyclists to slow down in advance of intersections or other geometric constraints, shall not be used. These devices cannot compensate for improper design.

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

For most bicycle path applications the superelevation rate will vary from a minimum of 2 percent (the minimum necessary to encourage adequate drainage) to a maximum of approximately 5 percent (beyond which maneuvering difficulties by slow bicyclists and adult tricyclists might be expected). A straight 2% cross slope is recommended on tangent sections. The minimum superelevation rate of 2% will be adequate for most conditions and will simplify construction. Superelevation rates steeper than 5 percent should be avoided on bike paths expected to have adult tricycle traffic.

The coefficient of friction depends upon speed; surface type, roughness, and condition; tire type and condition; and whether the surface is wet or dry. Friction factors used for design should be selected based upon the point at which centrifugal force causes the bicyclist to recognize a feeling of discomfort and instinctively act to avoid higher speed. Extrapolating from values used in highway design, design friction factors for paved bicycle paths can be assumed to vary from 0.31 at 20 km/h to 0.21 at 50 km/h. Although there is no data available for unpaved surfaces, it is suggested that friction factors be reduced by 50 percent to allow a sufficient margin of safety.

The minimum radius of curvature can be selected from Figure 1003.1C. When curve radii smaller than those shown in Figure 1003.1C must be used on bicycle paths because of right of way, topographical or other considerations, standard curve warning signs and supplemental pavement markings should be installed. The negative effects of nonstandard curves can also be partially offset by widening the pavement through the curves.

(9) *Stopping Sight Distance.* To provide bicyclists with an opportunity to see and react to the unexpected, a bicycle path should be designed with adequate stopping sight distances. The distance required to bring a bicycle to a full controlled stop is a function of the bicyclist's perception and brake reaction time, the initial speed of the bicycle, the coefficient of friction between the tires and the pavement, and the braking ability of the bicycle.

Figure 1003.1D indicates the minimum stopping sight distances for various design speeds and grades. For two-way bike paths, the descending direction, that is, where "G" is negative, will control the design.

Figure 1003.1C

Curve Radii & Superelevations

$$R = \frac{V^2}{127\left(\frac{e}{100} + f\right)}$$

where,

R = Minimum radius of curvature (m),

V = Design Speed (km/h),

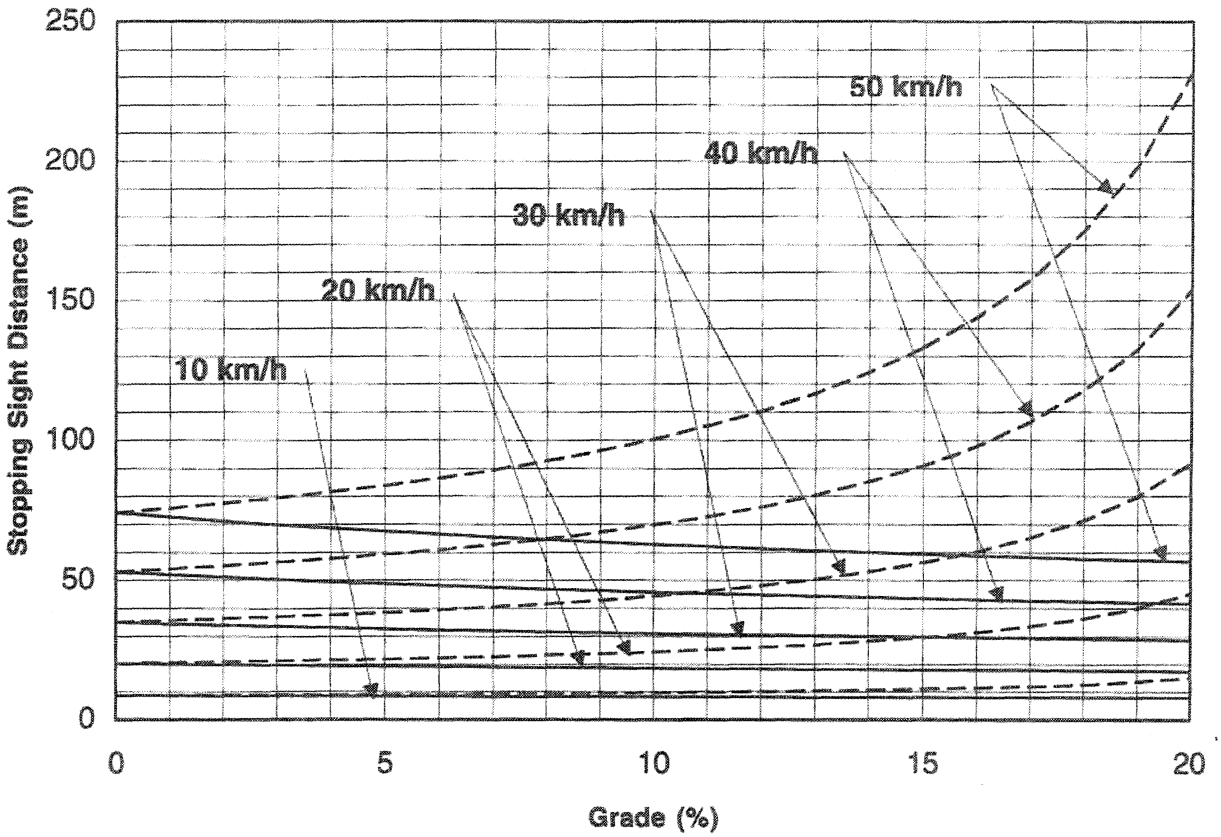
e = Rate of bikeway superelevation, percent

f = Coefficient of friction

Design Speed-V (km/h)	Friction Factor-f	Superelevation-e (%)	Minimum Radius-R (m)
20	0.31	2	10
30	0.28	2	24
40	0.25	2	47
50	0.21	2	86
20	0.31	3	9
30	0.28	3	23
40	0.25	3	45
50	0.21	3	82
20	0.31	4	9
30	0.28	4	22
40	0.25	4	43
50	0.21	4	79
20	0.31	5	9
30	0.28	5	21
40	0.25	5	42
50	0.21	5	76

Figure 1003.1D

Stopping Sight Distance



$$S = \frac{V^2}{254\,(f \pm G)} + \frac{V}{1.4}$$

Descend - - - - - -
Ascend ———

Where : S = stopping sight, m

V = velocity, km/h

f = coefficient of friction (use 0.25)

G = grade, m/m (rise/run)

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

(11) *Lateral Clearance on Horizontal Curves.* Figure 1003.1F indicates the minimum clearances to line of sight obstructions for horizontal curves. The required lateral clearance is obtained by entering Figure 1003.1F with the stopping sight distance from Figure 1003.1D and the proposed horizontal curve radius.

Bicyclists frequently ride abreast of each other on bicycle paths, and on narrow bicycle paths, bicyclists have a tendency to ride near the middle of the path. For these reasons, and because of the serious consequences of a head on bicycle accident, lateral clearances on horizontal curves should be calculated based on the sum of the stopping sight distances for bicyclists traveling in opposite directions around the curve. Where this is not possible or feasible, consideration should be given to widening the path through the curve, installing a yellow center line, installing a curve warning sign, or some combination of these alternatives.

(12) *Grades.* Bike paths generally attract less skilled bicyclists, so it is important to avoid steep grades in their design. Bicyclists not physically conditioned will be unable to negotiate long, steep uphill grades. Since novice bicyclists often ride poorly maintained bicycles, long downgrades can cause problems. For these reasons, bike paths with long, steep grades will generally receive very little use. The maximum grade rate recommended for bike paths is 5%. It is desirable that sustained grades be limited to 2% if a wide range of riders is to be accommodated. Steeper grades can be tolerated for short segments (e.g., up to about 150 m). Where steeper grades are necessitated, the design speed should be increased and additional width should be provided for maneuverability.

(13) *Pavement Structure.* The pavement structure of a bike path should be designed in the same manner as a highway, with consideration given to the quality of the basement soil and the anticipated loads the bikeway will experience. It is important to construct and maintain a smooth riding surface with skid resistant qualities. Principal loads will normally be from maintenance and emergency vehicles. Expansive soil should be given special consideration and will probably require a special structural section. A minimum pavement thickness of 50 mm of asphalt concrete is recommended. Type "A" or "B" asphalt concrete (as described in Department of Transportation Standard Specifications), with 12.5 mm maximum aggregate and medium grading is recommended. Consideration should be given to increasing the asphalt content to provide increased pavement life. Consideration should also be given to sterilization of basement soil to preclude possible weed growth through the pavement.

At unpaved highway or driveway crossings of bicycle paths, the highway or driveway should be paved a minimum of 3 m on each side of the crossing to reduce the amount of gravel being scattered along the path by motor vehicles. The pavement structure at the crossing should be adequate to sustain the expected loading at that location.

(14) *Drainage.* For proper drainage, the surface of a bike path should have a cross slope of 2%. Sloping in one direction usually simplifies longitudinal drainage design and surface construction, and accordingly is the preferred practice. Ordinarily, surface drainage from the path will be adequately dissipated as it flows down the gently sloping shoulder. However, when a bike path is constructed on the side of a hill, a drainage ditch of suitable dimensions may be necessary on the uphill side to intercept the hillside drainage. Where necessary, catch basins with drains should be provided to carry intercepted water across the path. Such ditches should be designed in such a way that no undue obstacle is presented to bicyclists.

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

Figure 1003.1E

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

$L = 2S - \frac{450}{A}$ when S>L

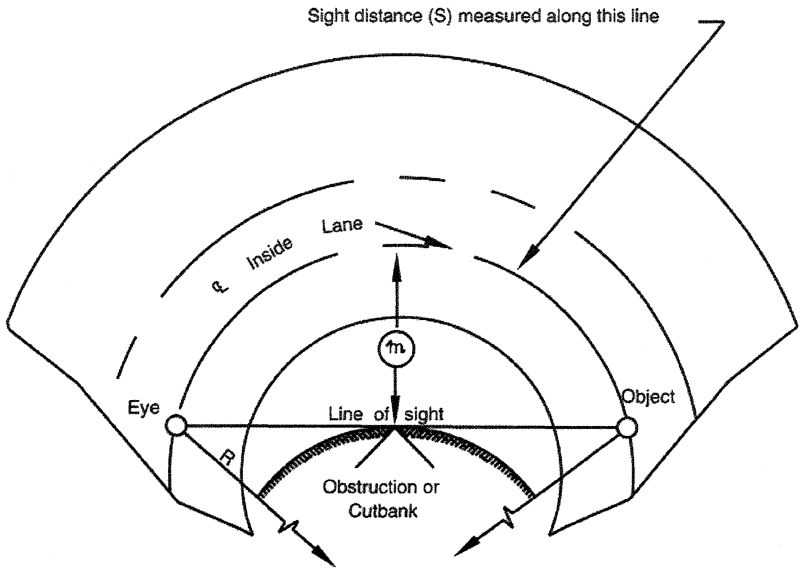
$L = \frac{AS^2}{450}$ when S<L

Double line represents S = L
L = Minimum length of vertical curve - meters
A = Algebraic grade difference - %
S = Stopping sight distance - meters
See Figure1003.1D to determine "S" for a given design speed "V"

Height of cyclist eye - 1400 mm Height of object - 100 mm

A	S = Stopping Sight Distance (m)										
(%)	15	20	25	30	35	40	45	50	55	60	
5								10.0	20.0	30.0	
6						5.0	15.0	25.0	35.0	45.0	
7		**S>L**			5.7	15.7	25.7	35.7	45.7	55.7	
8				3.8	13.8	23.8	33.8	43.8	53.8	64.0	
9				10.0	20.0	30.0	40.0	50.0	60.5	72.0	
10			5.0	15.0	25.0	35.0	45.0	55.6	67.2	80.0	
11			9.1	19.1	29.1	39.1	49.5	61.1	73.9	88.0	
12		2.5	12.5	22.5	32.5	42.7	54.0	66.7	80.7	96.0	
13		5.4	15.4	25.4	35.4	46.2	58.5	72.2	87.4	104.0	
14		7.9	17.9	27.9	38.1	49.8	63.0	77.8	94.1	112.0	
15		10.0	20.0	30.0	40.8	53.3	67.5	83.3	100.8	120.0	
16	1.9	11.9	21.9	32.0	43.6	56.9	72.0	88.9	107.6	128.0	
17	3.5	13.5	23.5	34.0	46.3	60.4	76.5	94.4	114.3	136.0	
18	5.0	15.0	25.0	36.0	49.0	64.0	81.0	100.0	121.0	144.0	
19	6.3	16.3	26.4	38.0	51.7	67.6	85.5	105.6	127.7	152.0	**S<L**
20	7.5	17.5	27.8	40.0	54.4	71.1	90.0	111.1	134.4	160.0	
21	8.6	18.6	29.2	42.0	57.2	74.7	94.5	116.7	141.2	168.0	
22	9.5	19.5	30.6	44.0	59.9	78.2	99.0	122.2	147.9	176.0	
23	10.4	20.4	31.9	46.0	62.6	81.8	103.5	127.8	154.6	184.0	
24	11.3	21.3	33.3	48.0	65.3	85.3	108.0	133.3	161.3	192.0	
25	12.0	22.2	34.7	50.0	68.1	88.9	112.5	138.9	168.1	200.0	

Figure 1003.1F
Lateral Clearances on Horizontal Curves



S = Sight distance in meters.
R = Radius of ℄ of lane in meters.
m = Distance from ℄ of lane in meters.
V = Design speed for S in km/h.
(Refer to Figure 1003.1D to determine "V", after "S" is determined.)

Angle is expressed in degrees

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

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

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

Line of sight is 600 mm above ℄ inside lane at point of obstruction.

GIVEN "R" AND "S"; FIND "m"

R (m)	S=10 m *m* meters	S=20 m *m* meters	S=30 m *m* meters	S=40 m *m* meters	S=50 *m* meters	S=60 m *m* meters	S=70 m *m* meters	S=80 m *m* meters	S=90 m *m* meters	S=100 m *m* meters	S=110 m *m* meters
25	0.50	1.97	4.37	7.58	11.49	15.94	20.75	25.73	30.68	35.41	39.72
50	0.25	1.00	2.23	3.95	6.12	8.73	11.76	15.17	18.92	22.99	27.32
75	0.17	0.67	1.50	2.65	4.13	5.92	8.02	10.42	13.10	16.06	19.28
100	0.12	0.50	1.12	1.99	3.11	4.47	6.06	7.90	9.96	12.24	14.75
125	0.10	0.40	0.90	1.60	2.49	3.58	4.87	6.35	8.01	9.87	11.91
150	0.08	0.33	0.75	1.33	2.08	2.99	4.07	5.30	6.70	8.26	9.97
175	0.07	0.29	0.64	1.14	1.78	2.57	3.49	4.55	5.75	7.10	8.57
200	0.06	0.25	0.56	1.00	1.56	2.25	3.06	3.99	5.04	6.22	7.52
225	0.06	0.22	0.50	0.89	1.39	2.00	2.72	3.55	4.49	5.53	6.69
250	0.05	0.20	0.45	0.80	1.25	1.80	2.45	3.19	4.04	4.98	6.03
275	0.05	0.18	0.41	0.73	1.14	1.63	2.22	2.90	3.67	4.53	5.48
300	0.04	0.17	0.37	0.67	1.04	1.50	2.04	2.66	3.37	4.16	5.03
350	0.04	0.14	0.32	0.57	0.89	1.29	1.75	2.28	2.89	3.57	4.31
400	0.03	0.13	0.28	0.50	0.78	1.12	1.53	2.00	2.53	3.12	3.78
500	0.03	0.10	0.23	0.40	0.62	0.90	1.22	1.60	2.02	2.50	3.02
600	0.02	0.08	0.19	0.33	0.52	0.75	1.02	1.33	1.69	2.08	2.52
700	0.02	0.07	0.16	0.29	0.45	0.64	0.87	1.14	1.45	1.79	2.16
800	0.02	0.06	0.14	0.25	0.39	0.56	0.77	1.00	1.27	1.56	1.89
900	0.01	0.06	0.13	0.22	0.35	0.50	0.68	0.89	1.12	1.39	1.68
1000	0.01	0.05	0.11	0.20	0.31	0.45	0.61	0.80	1.01	1.25	1.51

Figure 1003.1F

Lateral Clearances on Horizontal Curves (continued)

GIVEN "R" AND "m"; FIND "S"

R (m)	$m = 1$ meter	$m = 2$ meters	$m = 3$ meters	$m = 4$ meters	$m = 5$ meters	$m = 6$ meters	$m = 7$ meters	$m = 8$ meters	$m = 9$ meters	$m = 10$ meters	$m = 11$ meters
	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)
25	14.19	20.13	24.74	28.67	32.17	35.37	38.35	41.15	43.81	46.36	48.82
50	20.03	28.38	34.81	40.27	45.10	49.49	53.55	57.35	60.93	64.35	67.61
75	24.52	34.72	42.57	49.21	55.08	60.40	65.32	69.91	74.23	78.34	82.26
100	28.31	40.06	49.11	56.75	63.51	69.63	75.27	80.54	85.50	90.20	94.68
125	31.64	44.78	54.88	63.41	70.94	77.77	84.06	89.92	95.44	100.67	105.66
150	34.66	49.04	60.10	69.43	77.67	85.13	92.00	98.41	104.44	110.15	115.60
175	37.43	52.96	64.90	74.97	83.86	91.91	99.32	106.23	112.73	118.88	124.75
200	40.01	56.61	69.36	80.13	89.62	98.22	106.13	113.51	120.45	127.01	133.27
225	42.44	60.04	73.56	84.97	95.04	104.15	112.53	120.35	127.70	134.66	141.28
250	44.73	63.28	77.53	89.56	100.16	109.76	118.59	126.82	134.56	141.89	148.86
275	46.91	66.37	81.31	93.92	105.03	115.09	124.35	132.98	141.09	148.77	156.08
300	49.00	69.32	84.92	98.08	109.69	120.19	129.86	138.86	147.33	155.34	162.97
350	52.92	74.86	91.71	105.92	118.45	129.79	140.22	149.94	159.08	167.72	175.95
400	56.58	80.03	98.03	113.22	126.61	138.73	149.87	160.26	170.01	179.25	188.04
500	63.25	89.47	109.59	126.57	141.53	155.06	167.52	179.11	190.01	200.32	210.13
600	69.29	98.00	120.04	138.63	155.02	169.83	183.47	196.16	208.09	219.38	230.12
700	74.84	105.85	129.65	149.73	167.42	183.42	198.14	211.85	224.72	236.91	248.50
800	80.00	113.15	138.60	160.05	178.97	196.07	211.80	226.45	240.21	253.23	265.62
900	84.85	120.01	147.00	169.76	189.81	207.95	224.63	240.16	254.75	268.56	281.69
1000	89.44	126.50	154.95	178.93	200.07	219.18	236.76	253.13	268.51	283.06	296.90

(15) *Barrier Posts.* It may be necessary to install barrier posts at entrances to bike paths to prevent motor vehicles from entering. For barrier post placement, visibility marking, and pavement markings, see the MUTCD and California Supplement, Section 9C.101.

Generally, barrier configurations that preclude entry by motorcycles present safety and convenience problems for bicyclists. Such devices should be used only where extreme problems are encountered.

(16) *Lighting.* Fixed-source lighting reduces conflicts along paths and at intersections. In addition, lighting allows the bicyclist to see the bicycle path direction, surface conditions, and obstacles. Lighting for bicycle paths is important and should be considered where riding at night is expected, such as bicycle paths serving college students or commuters, and at highway intersections. Lighting should also be considered through underpasses or tunnels, and when nighttime security could be a problem.

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

1003.2 Class II Bikeways

Class II bikeways (bike lanes) for preferential use by bicycles are established within the paved area of highways. Bike lane pavement markings are intended to promote an orderly flow of traffic, by establishing specific lines of demarcation between areas reserved for bicycles and lanes to be occupied by motor vehicles. This effect is supported by bike lane signs and pavement markings. Bike lane pavement markings can increase bicyclists' confidence that motorists will not stray into their path of travel if they remain within the bike lane. Likewise, with more certainty as to where bicyclists will be, passing motorists are less apt to swerve toward opposing traffic in making certain they will not hit bicyclists.

Class II bike lanes shall be one-way facilities. Two-way bike lanes (or bike paths that are contiguous to the roadway) are not permitted, as such facilities have proved unsatisfactory and promote riding against the flow of motor vehicle traffic.

(1) *Widths.* Typical Class II bikeway configurations are illustrated in Figure 1003.2A and are described below:

(a) Figure 1003.2A-(1) depicts bike lanes on an urban type curbed street where parking stalls (or continuous parking stripes) are marked. Bike lanes are located between the parking area and the traffic lanes. **As indicated, 1.5 m shall be the minimum width of bike lane where parking stalls are marked.** If parking volume is substantial or turnover high, an additional 0.3 m to 0.6 m of width is desirable.

Bike lanes shall not be placed between the parking area and the curb. Such facilities increase the conflict between bicyclists and opening car doors and reduce visibility at intersections. Also, they prevent bicyclists from leaving the bike lane to turn left and cannot be effectively maintained.

(b) Figure 1003.2A-(2) depicts bike lanes on an urban-type curbed street, where parking is permitted, but without parking stripe or stall marking. Bike lanes are established in conjunction with the parking areas. **As indicated, 3.3 m or 3.6 m (depending on the type of curb) shall be the minimum width of the bike lane where parking is permitted.** This type of lane is satisfacory where parking is not extensive and where turnover of parked cars is infrequent. However, if parking is substantial, turnover of parked cars is high, truck traffic is substantial, or if vehicle speeds exceed 55 km/h, additional width is recommended.

(c) Figure 1003.2A-(3) depicts bike lanes along the outer portions of an urban type curbed street, where parking is prohibited. This is generally the most desirable configuration for bike lanes, as it eliminates potential conflicts resulting from auto parking (e.g.,

opening car doors). **As indicated, if no gutter exists, the minimum bike lane width shall be 1.2 m. With a normal 600 mm gutter, the minimum bike lane width shall be 1.5 m.** The intent is to provide a minimum 1.2 m wide bike lane, but with at least 0.9 m between the traffic lane and the longitudinal joint at the concrete gutter, since the gutter reduces the effective width of the bike lane for two reasons. First, the longitudinal joint may not always be smooth, and may be difficult to ride along. Secondly, the gutter does not provide a suitable surface for bicycle travel. Where gutters are wide (say, 1.2 m), an additional 0.9 m must be provided because bicyclists should not be expected to ride in the gutter. Wherever possible, the width of bike lanes should be increased to 1.8 to 2.4 m to provide for greater safety. 2.4 m bike lanes can also serve as emergency parking areas for disabled vehicles.

Striping bike lanes next to curbs where parking is prohibited only during certain hours shall be done only in conjunction with special signing to designate the hours bike lanes are to be effective. Since the Vehicle Code requires bicyclists to ride in bike lanes where provided (except under certain conditions), proper signing is necessary to inform bicyclists that they are required to ride in bike lanes only during the course of the parking prohibition. This type of bike lane should be considered only if the vast majority of bicycle travel would occur during the hours of the parking prohibition, and only if there is a firm commitment to enforce the parking prohibition. Because of the obvious complications, this type of bike lane is not encouraged for general application.

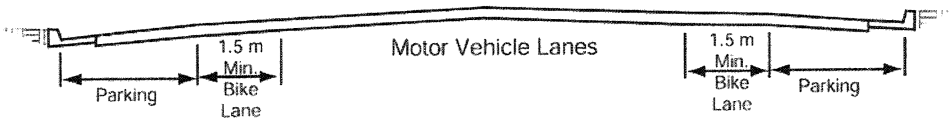
Figure 1003.2A(4) depicts bike lanes on a highway without curbs and gutters. This location is in an undeveloped area where infrequent parking is handled off the pavement. This can be accomplished by supplementing the bike lane signing with R25 (park off pavement) signs, or R26 (no parking) signs. **Minimum widths shall be as shown.** Additional width is desirable, particularly where motor vehicle speeds exceed 55 km/h.

Per Topic 301, the minimum lane width standard is 3.6 m. There are situations where it may be desirable to reduce the width of the traffic lanes in order to add or widen bicycle lanes or shoulders. In determining the appropriateness of narrower traffic lanes, consideration should be given to factors such as motor vehicle speeds, truck volumes, alignment, bicycle lane width, sight distance, and the presence of on-street vehicle parking when vehicle parking is permitted adjacent to a bicycle lane, or on a shoulder where bicycling is not prohibited, reducing the width of the adjacent traffic lane may allow for wider bicycle lanes or shoulders, to provide greater clearance between bicyclists and driver-side doors when opened. Where favorable conditions exist, traffic lanes of 3.3 m may be feasible but must be approved per Topic 301.

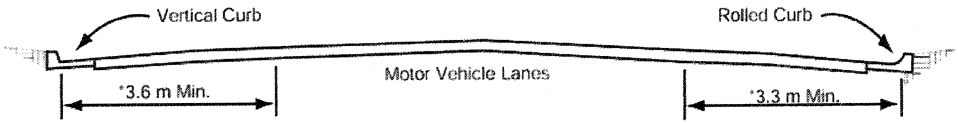
Bike lanes are not advisable on long, steep downgrades, where bicycle speeds greater than 50 km/h are expected. As grades increase, downhill bicycle speeds will increase, which increases the problem of riding near the edge of the roadway. In such situations, bicycle speeds can approach those of motor vehicles, and experienced bicyclists will generally move into the motor vehicle lanes to increase sight distance and maneuverability. If bike lanes are to be marked, additional width should be provided to accommodate higher bicycle speeds.

If the bike lanes are to be located on one-way streets, they should be placed on the right side of the street. Bike lanes on the left side would cause bicyclists and motorists to undertake crossing maneuvers in making left turns onto a two-way street.

Figure 1003.2A
Typical Bike Lane Cross Sections
(On 2-lane or Multilane Highways)

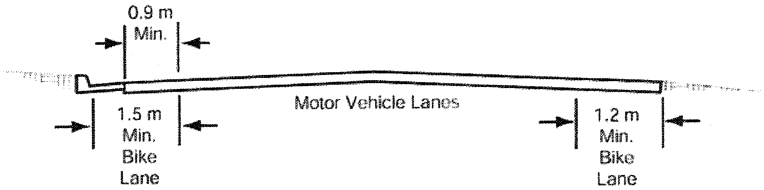


(1) MARKED PARKING



* 3.9 is recommended where there is substantial parking or turnover of parked cars is high (e.g. commerical areas).

(2) PARKING PERMITTED WITHOUT MARKED PARKING OR STALL



(With Gutter) **(3) PARKING PROHIBITED** (Without Gutter)

(4) TYPICAL ROADWAY IN OUTLYING AREAS PARKING RESTRICTED

Note: For pavement marking guidance, see the MUTCD and California Supplement, Section 9C.04

(2) *Signing and Pavement Markings.* Details for signing and pavement marking of Class II bikeways are found in the MUTCD and California Supplement, Section 9C.04.

(3) *At-grade Intersection Design.* Most auto/bicycle accidents occur at intersections. For this reason, bikeway design at intersections should be accomplished in a manner that will minimize confusion by motorists and bicyclists, and will permit both to operate in accordance with the normal rules of the road.

Figure 1003.2B illustrates a typical at-grade intersection of multilane streets, with bike lanes on all approaches. Some common movements of motor vehicles and bicycles are shown. A prevalent type of accident involves straight-through bicycle traffic and right-turning motorists. Left-turning bicyclists also have problems, as the bike lane is on the right side of the street, and bicyclists have to cross the path of cars traveling in both directions. Some bicyclists are proficient enough to merge across one or more lanes of traffic, to use the inside lane or left-turn lane. However, there are many who do not feel comfortable making this maneuver. They have the option of making a two-legged left turn by riding along a course similar to that followed by pedestrians, as shown in the diagram. Young children will often prefer to dismount and change directions by walking their bike in the crosswalk.

(4) *Interchange Design.* As with bikeway design through at-grade intersections, bikeway design through interchanges should be accomplished in a manner that will minimize confusion by motorists and bicyclists. Designers should work closely with the local agency in designing bicycle facilities through interchanges. Local Agencies should carefully select interchange locations which are most suitable for bikeway designations and where the crossing meets applicable design standards. The local agency may have special needs and desires for continuity through interchanges which should be considered in the design process.

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

The shoulder width shall not be reduced through the interchange area. The minimum shoulder width shall match the approach roadway shoulder width, but not less than 1.2 m or 1.5 m if a gutter exists. If the shoulder width is not available, the designated bike lane shall end at the previous local road intersection.

Depending on the intersection angles, either Figure 1003.2C or 1003.2D should also be used for multilane ramp intersections. Additionally, the outside through lane should be widened to 4.2 m when feasible. This allows extra room for bicycles to share the through lane with vehicles. The outside shoulder width should not be reduced through the interchange area to accommodate this additional width.

1003.3 Class III Bikeways

Class III bikeways (bike routes) are intended to provide continuity to the bikeway system. Bike routes are established along through routes not served by Class I or II bikeways, or to connect discontinuous segments of bikeway (normally bike lanes). Class III facilities are shared facilities, either with motor vehicles on the street, or with pedestrians on sidewalks, and in either case bicycle usage is secondary. Class III facilities are established by placing Bike Route signs along roadways.

Minimum widths for Class III bikeways are not presented, as the acceptable width is dependent on many factors, including the volume and character of vehicular traffic on the road, typical speeds, vertical and horizontal alignment, sight distance, and parking conditions.

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

Figure 1003.2B

Typical Bicycle/Auto Movements at Intersections of Multilane Streets

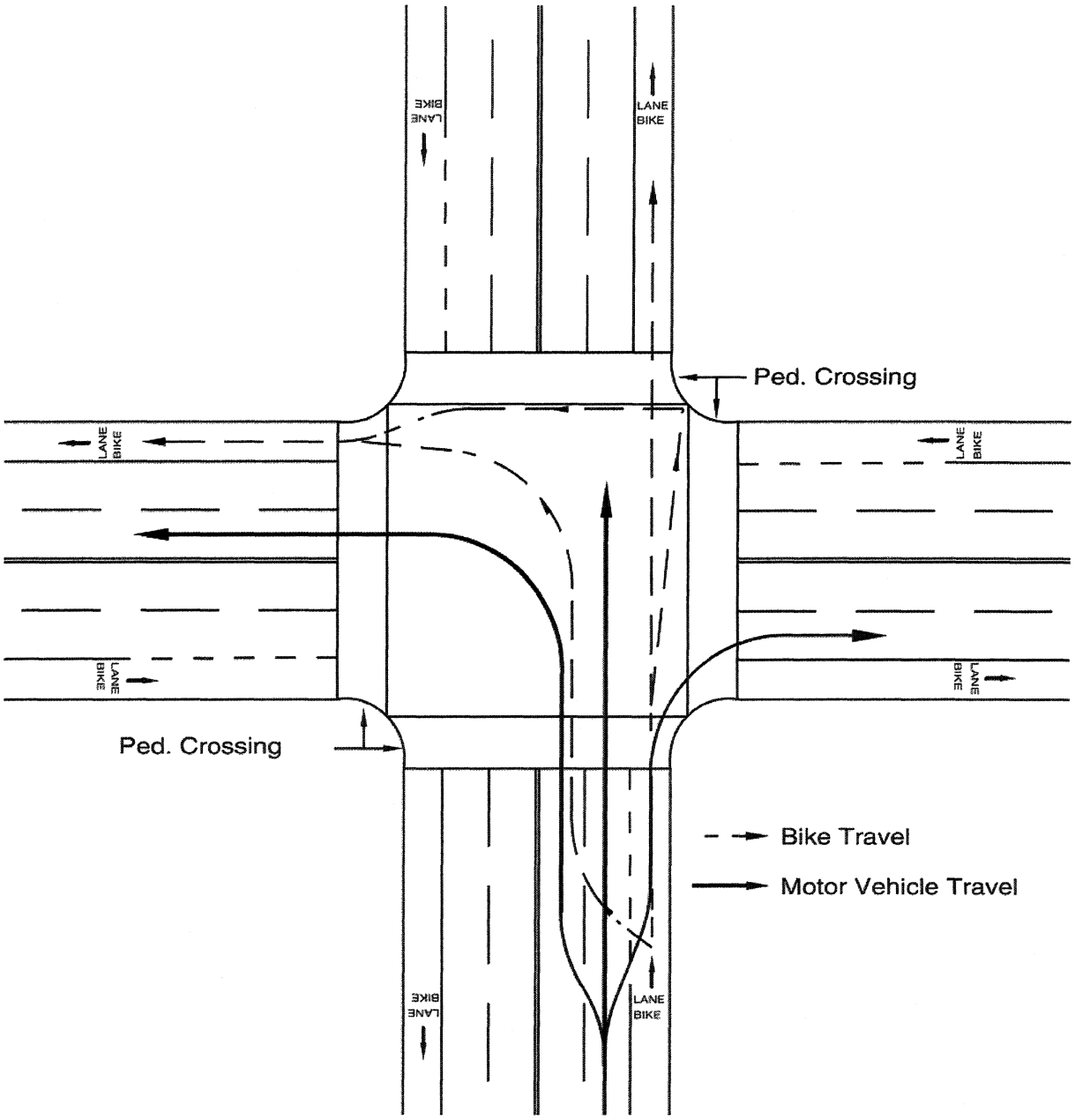
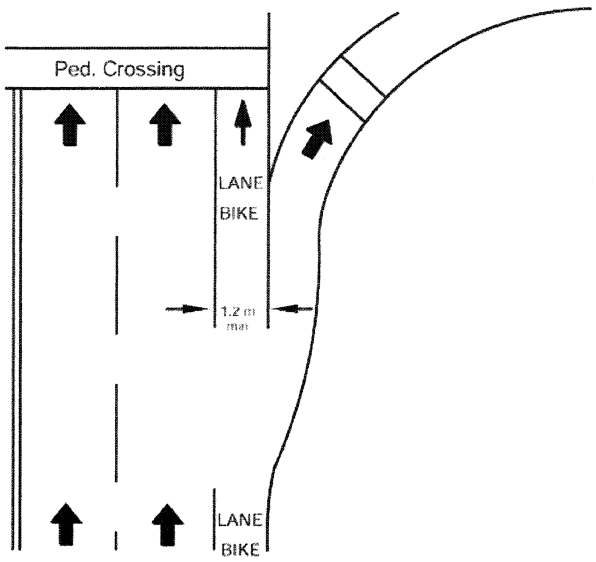
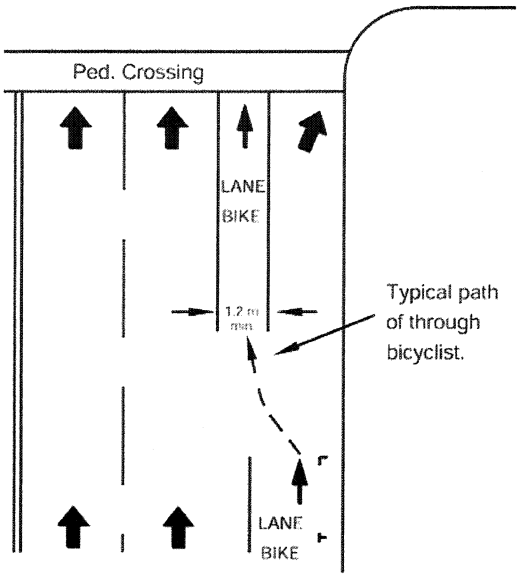


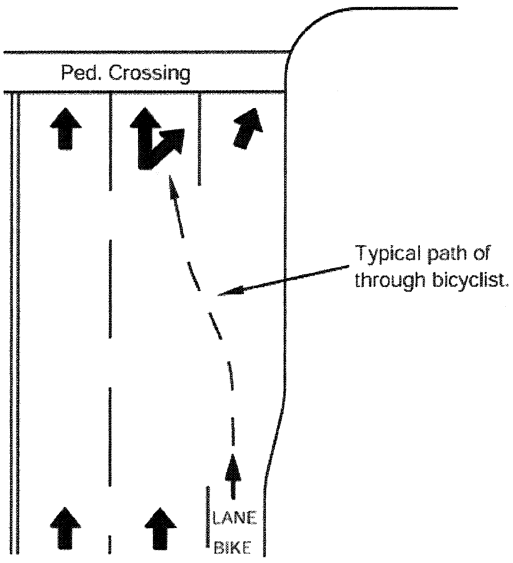
Figure 1003.2C
Bike Lanes Approaching Motorist
Right-turn-only Lane



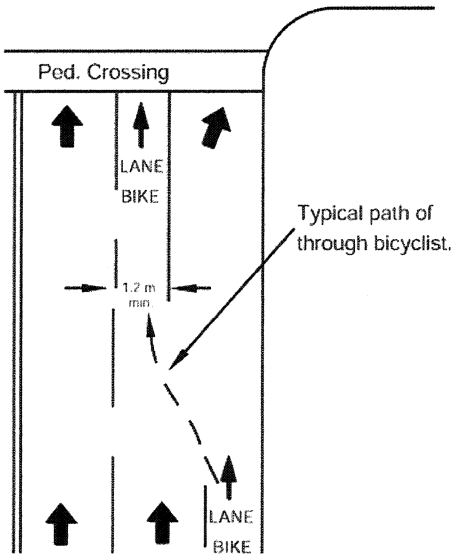
(1) RIGHT-TURN-ONLY LANE



(2) PARKING AREA BECOMES
RIGHT-TURN-ONLY LANE



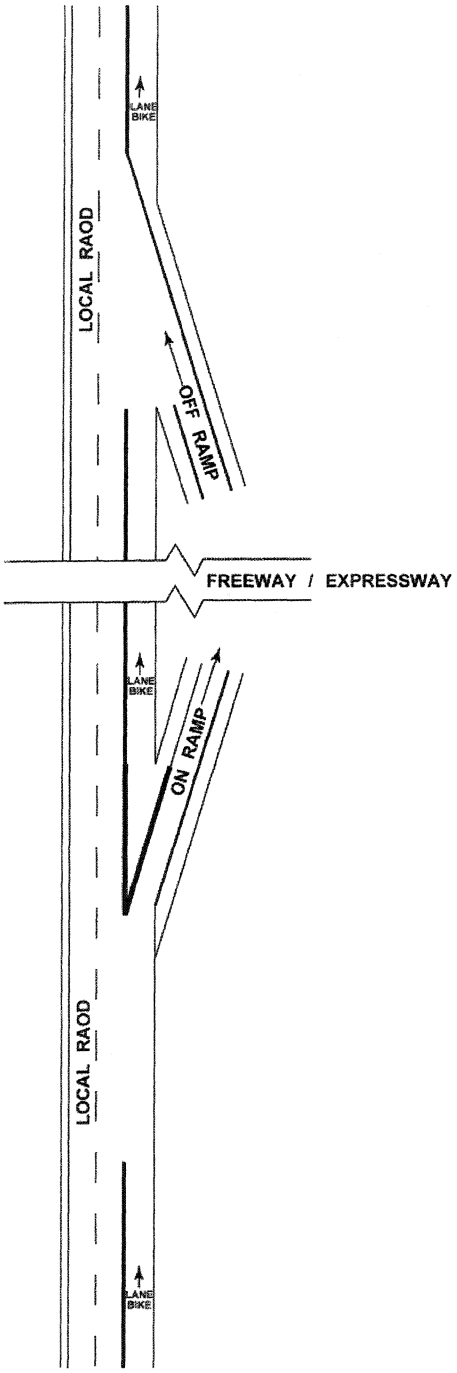
(3) OPTIONAL DOUBLE
RIGHT-TURN-ONLY LANE



(4) RIGHT LANE BECOMES
RIGHT-TURN-ONLY LANE

Note: For bicycle lane markings, see the MUTCD and California Supplement, Section 9C.04.

Figure 1003.2D
Bike Lanes Through Interchanges



Notes:

1.) See Index 1003.2 (4) for additional information.

2.) The shoulder width shall not be reduced through the interchange area. The minimum shoulder width shall match the approach roadway shoulder width, but not less than 1.2 m or 1.5 m if a gutter exists. If the shoulder width is not available, the designated bike lane shall end at the previous local raod intersection.

3.) See Index 1003.3 (4) for information on Bike Routes Through Interchanges.

(1) *On-street Bike Route Criteria.* To be of benefit to bicyclists, bike routes should offer a higher degree of service than alternative streets. Routes should be signed only if some of the following apply:

(a) They provide for through and direct travel in bicycle-demand corridors.

(b) Connect discontinuous segments of bike lanes.

(c) An effort has been made to adjust traffic control devices (stop signs, signals) to give greater priority to bicyclists, as compared with alternative streets. This could include placement of bicycle-sensitive detectors on the right-hand portion of the road, where bicyclists are expected to ride.

(d) Street parking has been removed or restricted in areas of critical width to provide improved safety.

(e) Surface imperfections or irregularities have been corrected (e.g., utility covers adjusted to grade, potholes filled, etc.).

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

(2) *Sidewalk Bikeway Criteria.* In general, the designated use of sidewalks (as a Class III bikeway) for bicycle travel is unsatisfactory.

It is important to recognize that the development of extremely wide sidewalks does not necessarily add to the safety of sidewalk bicycle travel, as wide sidewalks will encourage higher speed bicycle use and can increase potential for conflicts with motor vehicles at intersections, as well as with pedestrians and fixed objects.

Sidewalk bikeways should be considered only under special circumstances, such as:

(a) To provide bikeway continuity along high speed or heavily traveled roadways having inadequate space for bicyclists, and uninterrupted by driveways and intersections for long distances.

(b) On long, narrow bridges. In such cases, ramps should be installed at the sidewalk approaches. If approach bikeways are two-way, sidewalk facilities should also be two-way.

Whenever sidewalk bikeways are established, a special effort should be made to remove unnecessary obstacles. Whenever bicyclists are directed from bike lanes to sidewalks, curb cuts should be flush with the street to assure that bicyclists are not subjected to problems associated with crossing a vertical lip at a flat angle. Also curb cuts at each intersection are necessary. Curb cuts should be wide enough to accommodate adult tricycles and two-wheel bicycle trailers.

In residential areas, sidewalk riding by young children too inexperienced to ride in the street is common. With lower bicycle speeds and lower auto speeds, potential conflicts are somewhat lessened, but still exist. Nevertheless, this type of sidewalk bicycle use is accepted. But it is inappropriate to sign these facilities as bikeways. Bicyclists should not be encouraged (through signing) to ride facilities that are not designed to accommodate bicycle travel.

(3) *Destination Signing of Bike Routes.* For Bike Route signs to be more functional, supplemental plates may be placed beneath them when located along routes leading to high demand destinations (e.g., "To Downtown"; "To State College"; etc. For typical signing, see the MUTCD and California Supplement, Figures 9B-5 and 9B-6.

There are instances where it is necessary to sign a route to direct bicyclists to a logical destination, but where the route does not offer any of the above listed bike route features. In such cases, the route should not be signed as a bike route; however, destination signing may be advisable. A typical application of destination signing would be where bicyclists are directed off a highway to bypass a section of freeway. Special signs would be placed to guide bicyclists to the next logical destination. The intent is to direct bicyclists in the same way as motorists would be directed if a highway detour was necessitated.

(4) *Interchange Design* As with bikeway design through at-grade intersections, bikeway design through interchanges should be accomplished in a manner that will minimize confusion by motorists and bicyclists. Designers should work closely with the local agency in designing bicycle facilities through interchanges. Local Agencies should carefully select interchange locations which are most suitable for bikeway designations and where the crossing meets applicable design standards. The local agency may have special needs and desires for continuity through interchanges which should be considered in the design process.

Within the Interchange area the bike route shall require either an outside lane width of 4.8 m or a 3.6 m lane and a 1.2 m shoulder. If the above width is not available, the designated bike route shall end at the previous local road intersection.

1003.4 Bicycles on Freeways

In some instances, bicyclists are permitted on freeways. Seldom would a freeway be designated as a bikeway, but it can be opened for use if it meets certain criteria. Essentially, the criteria involve assessing the safety and convenience of the freeway as compared with available alternate routes. However, a freeway should not be opened to bicycle use if it is determined to be incompatible. The Headquarters Traffic Liaisons and the Design Coordinator must approve any proposals to open freeways to bicyclists.

If a suitable alternate route exists, it would normally be unnecessary to open the freeway. However, if the alternate route is unsuitable for bicycle travel the freeway may be a better alternative for bicyclists. In determining the suitability of an alternate route, safety should be the paramount consideration. The following factors should be considered:

- Number of intersections
- Shoulder widths
- Traffic volumes
- Vehicle speeds
- Bus, truck and recreational vehicle volumes
- Grades
- Travel time

When a suitable alternate route does not exist, a freeway shoulder may be considered for bicycle travel. Normally, freeways in urban areas will have characteristics that make it unfeasible to permit bicycle use. In determining if the freeway shoulder is suitable for bicycle travel, the following factors should be considered;

- Shoulder widths
- Bicycle hazards on shoulders (drainage grates, expansion joints, etc.)
- Number and location of entrance/exit ramps
- Traffic volumes on entrance/exit ramps
- Bridge Railing height

When bicyclists are permitted on segments of freeway, it will be necessary to modify and supplement freeway regulatory signs, particularly those at freeway ramp entrances and exits, see the MUTCD and California Supplement, Section 9B.101.

Where no reasonable alternate route exists within a freeway corridor, the Department should coordinate with local agencies to develop or improve existing routes or provide parallel bikeways within or adjacent to the freeway right of way.

The long term goal is to provide a safe and convenient non-freeway route for bicycle travel.

1003.5 Multipurpose Trails

In some instances, it may be appropriate for agencies to develop multipurpose trails - for hikers, joggers, equestrians, bicyclists, etc. Many of these trails will not be paved and will not meet the standards for Class I bikeways. As such, these facilities should not be signed as bikeways. Rather, they should be designated as multipurpose trails (or similar designation), along with regulatory signing to restrict motor vehicles, as appropriate.

If multipurpose trails are primarily to serve bicycle travel, they should be developed in accordance with standards for Class I bikeways. In general, multipurpose trails are not recommended as high speed transportation facilities for bicyclists because of conflicts between bicyclists and pedestrians.

Wherever possible, separate bicycle and pedestrian paths should be provided. If this is not feasible, additional width, signing and pavement markings should be used to minimize conflicts.

It is undesirable to mix mopeds and bicycles on the same facility. In general, mopeds should not be allowed on multipurpose trails because of conflicts with slower moving bicyclists and pedestrians. In some cases where an alternate route for mopeds does not exist, additional width, signing, and pavement markings should be used to minimize conflicts. Increased patrolling by law enforcement personnel is also recommended to enforce speed limits and other rules of the road.

It is usually not desirable to mix horses and bicycle traffic on the same multipurpose trail. Bicyclists are often not aware of the need for slower speeds and additional operating space near horses. Horses can be startled easily and may be unpredictable if they perceive approaching bicyclists as a danger. In addition, pavement requirements for safe bicycle travel are not suitable for horses. For these reasons, a bridle trail separate from the multipurpose trail is recommended wherever possible.

1003.6 Miscellaneous Bikeway Criteria

The following are miscellaneous bikeway criteria which should be followed to the extent pertinent to Class I, II and III bikeways. Some, by their very nature, will not apply to all classes of bikeway. Many of the criteria are important to consider on any highway where bicycle travel is expected, without regard to whether or not bikeways are established.

(1) Bridges. Bikeways on highway bridges must be carefully coordinated with approach bikeways to make sure that all elements are compatible. For example, bicycle traffic bound in opposite directions is best accommodated by bike lanes on each side of a highway. In such cases, a two-way bike path on one side of a bridge would normally be inappropriate, as one direction of bicycle traffic would be required to cross the highway at grade twice to get to and from the bridge bike path. Because of the inconvenience, many bicyclists will be encouraged to ride on the wrong side of the highway beyond the bridge termini.

The following criteria apply to a two-way bike path on one side of a highway bridge:

(a) The bikeway approach to the bridge should be by way of a separate two-way facility for the reason explained above.

(b) **A physical separation, such as a chain link fence or railing, shall be provided to offset the adverse effects of having bicycles traveling against motor vehicle traffic.** The physical separation should be designed to minimize fixed end hazards to motor vehicles and if the bridge is an interchange structure, to minimize sight distance restrictions at ramp intersections.

It is recommended that bikeway bridge railings or fences placed between traffic lanes and bikeways be at least 1.4 m high to minimize the likelihood of bicyclists falling over the railings. Standard bridge railings which are lower than 1.4 m can be retrofitted with lightweight upper railings or chain link fence suitable to restrain bicyclists. See Index 208.10(6) for guidance regarding bicycle railing on bridges.

Separate highway overcrossing structures for bikeway traffic shall conform to Caltrans' standard pedestrian overcrossing design loading. The minimum clear width shall be the paved width of the approach bikeway but not less than 2.4 m. If pedestrians are to use the structure, additional width is recommended.

(2) Surface Quality. The surface to be used by bicyclists should be smooth, free of potholes, and the pavement edge uniform. For rideability on new construction, the finished surface of bikeways should not vary more than 6 mm from the lower edge of a 2.4 m long straight edge when laid on the surface in any direction.

Table 1003.6 indicates the recommended bikeway surface tolerances for Class II and III bikeways developed on existing streets to minimize the potential for causing bicyclists to lose control of their bicycle (Note: Stricter tolerances should be achieved on new bikeway construction.) Shoulder rumble strips are not suitable as a riding surface for bicycles. See the MUTCD and California Supplement,

Chapter 3B for additional information regarding rumble strip design considerations for bicycles.

Table 1003.6
Bikeway Surface Tolerances

Direction of Travel	Grooves(1)	Steps(2)
Parallel to travel	No more than 12 mm wide	No more than 10 mm high
Perpendicular to travel	---	No more than 20 mm high

(1) Groove--A narrow slot in the surface that could catch a bicycle wheel, such as a gap between two concrete slabs.

(2) Step--A ridge in the pavement, such as that which might exist between the pavement and a concrete gutter or manhole cover; or that might exist between two pavement blankets when the top level does not extend to the edge of the roadway.

(3) *Drainage Grates, Manhole Covers, and Driveways*. Drainage inlet grates, manhole covers, etc., on bikeways should be designed and installed in a manner that provides an adequate surface for bicyclists. They should be maintained flush with the surface when resurfacing.

Drainage inlet grates on bikeways shall have openings narrow enough and short enough to assure bicycle tires will not drop into the grates (e.g., reticuline type), regardless of the direction of bicycle travel. Where it is not immediately feasible to replace existing grates with standard grates designed for bicycles, 25 mm x 6 mm steel cross straps should be welded to the grates at a spacing of 150 mm to 200 mm on centers to reduce the size of the openings adequately.

Corrective actions described above are recommended on all highways where bicycle travel is permitted, whether or not bikeways are designated.

Future driveway construction should avoid construction of a vertical lip from the driveway to the gutter, as the lip may create a problem for bicyclists when entering from the edge of the roadway at a flat angle. If a lip is deemed necessary, the height should be limited to 15 mm.

(4) *At-grade Railroad Crossings and Cattle Guards*. Whenever it is necessary to cross railroad tracks with a bikeway, special care must be taken to assure that the safety of bicyclists is protected. The bikeway crossing should be at least as wide as the approaches of the bikeway. Wherever possible, the crossing should be straight and at right angles to the rails. For on-street bikeways where a skew is unavoidable, the shoulder (or bike lane) should be widened, if possible, to permit bicyclists to cross at right angles (see Figure 1003.6A). If this is not possible, special construction and materials should be considered to keep the flangeway depth and width to a minimum.

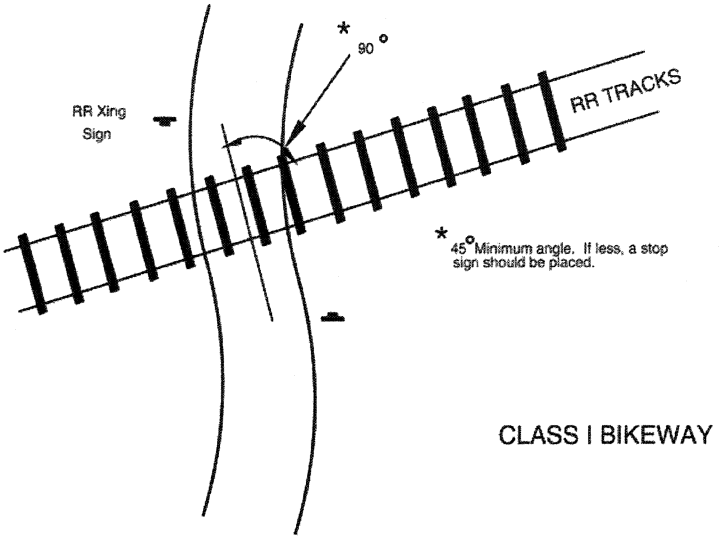
Pavement should be maintained so ridge buildup does not occur next to the rails. In some cases, timber plank crossings can be justified and can provide for a smoother crossing. Where hazards to bicyclist cannot be avoided, appropriate signs should be installed to warn bicyclists of the danger.

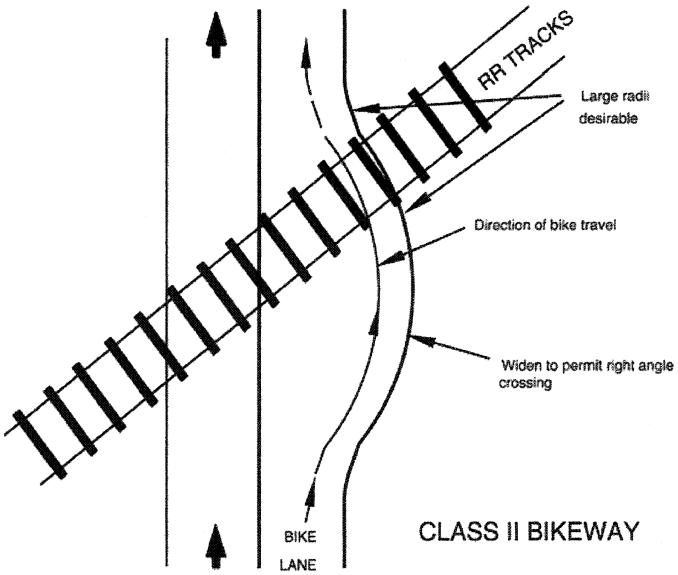
All railroad crossings are regulated by the California Public Utilities Commission (CPUC). All new bike path railroad crossings must be approved by the CPUC. Necessary railroad protection will be determined based on a joint field review involving the applicant, the railroad company, and the CPUC.

The presence of cattle guards along any roadway where bicyclists are expected should be clearly marked with adequate advance warning.

(5) *Obstruction Markings*. Vertical barriers and obstructions, such as abutments, piers, and other features causing bikeway constriction, should be clearly marked to gain the attention of approaching bicyclists. This treatment should be used only where unavoidable, and is by no means a substitute for good bikeway design. See the MUTCD, Section 9C.06.

Figure 1003.6A
Railroad Crossings





Appendix B: Public Input

Workshop #1 Summary

The first public workshop was help on Saturday, February 2nd, 2008 at the Community Rooms of the Oceanside Public Library. Over 50 people attended the workshop as a PowerPoint presentation was given describing the project background, bicycle facility types and assets and issues regarding bicycle related topics in the City of Oceanside. Surveys were handed out and twenty-two (22) were filled out at the workshop. Copies of the flyers were sent with the January water bill and were also mailed to bike shops, community centers and libraries in the City of Oceanside to notify the public of the workshop.

Display boards included:
Circulation Element Background
Existing Bicycle Facilities
Programmed Bicycle Facilities
Activity Centers
Bicycle Related Collisions (2004 - July 2007)

Comments from the workshop maps are as follows:

1. Bike Path (Class 1) thru Pendleton to tie-in with rail trail
2. Coordinate and connect Class 1 trail through Pendleton to San Clemente
3. Drinking fountains and toilet rooms along river trail
4. Use sewer easements as bike trails (Class 1) wherever possible
5. Possible trail areas at Whelan Lake – Off-road
6. "Burma Shave" signs for courtesy education near trail heads
7. Connect SLR trail to Frazee
8. Tie current and future Class 1 trails together to form a complete loop through Guajome Park

9. "Share the Road" sign to help safety at College Blvd and SR-76
10. Require developers to include dedicated bike paths thru newly developed areas
11. Bike/ped/equestrian crossing at 76 from Jefferies Ranch
12. Need safe passage (between North River Rd and SR-76, south of Sleeping Indian Rd
13. Connect Trail on SLR River past Guajome Park to County Park (future) trail at City limits
14. Connect the bike trail (path) to Jefferies Ranch area. Please!
15. Connect Jefferies Ranch to Guajome Park for bikes/peds and horses without crossing over Melrose. – eg: bridge under Melrose at spur along Spring Creek
16. Bike trail thru Guajome Park for City loop trail. SLR/Guajome/ Sprinter/Pacific Ave
17. Bike lanes for children to ride their bikes to school
18. Bike lanes here (Olive Dr) for safe commuting to school on Olive (in Vista) Olive Elementary
19. Olive – could we have bike lane striping as part of road improvements?
20. This intersection is dangerous (Olive and College)
21. "Share the Road" signs to help safety (College and Oceanside Blvd)
22. Old Grove as Class 2 connection (between Mesa Dr and College Blvd)
23. Need safe passage along Sprinter corridor – multi-use pathway
24. Add bots dots on bike lane lines at convex curves so motorists know they are encroaching – like here (Corporate Center Dr)
25. "Share the Road" signs to help safety (College and 78)
26. Can we have pathways thru the 78 corridor
27. Imperative to develop Class1 path along sprinter corridor the entire length

28. Off-road mtn bike trails – include at El Corazon or Morro Hills or Pilgrim Creek areas
29. Unsafe area for cycling (El Camino Real south of SR-78)
30. Is this really going to happen? (Sprinter rail trail)
31. I'm excited about planned routes to the coast and our Oceanside Blvd! Are these a "sure thing?"
32. "Share the Road" signs for safety on Mission Road
33. Sign connection from Coast Hwy to Vista Way
34. Parking incentives for on-site bike parking and showers/lockers
35. Add directional signs – 3"X___" at key locations
36. Coast Hwy as a Class 2
37. Measure minimum bike lane from gutter edge vs. curb edge. (to avoid crack in middle of path)
38. Make Pacific Ave a Class 1 by deleting parking on coast side. Many driveways / few cars
39. NCTD prohibits use of bikes in train parking lot
40. More bike racks at store malls and attractor at Pier
41. Need 1 or 2 more trash containers west of Benet. Maybe one at terminus at Surfrider? (along SLR)
42. Please do whatever you can to get the Class 1 Coastal Rail Trail and the Oceanside Blvd trails built. Access from the beach to El Corazon would be great!
43. Error! There are no bike lanes at any of the Hwy 78 crossings (~500m either side)
44. Signage to SLR at SR-76 and College

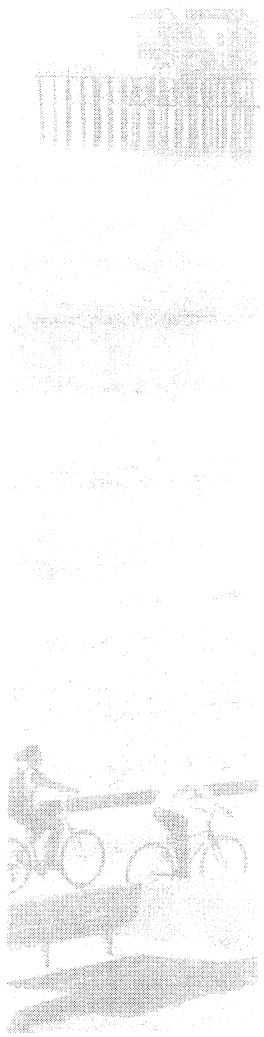
Online survey summary (as of February 8, 2008)
Total surveys: 118

What city do you live in?
Oceanside – 82.2%
San Diego – 6.78%
Carlsbad – 5.93%
Vista – 1.69%
Encinitas – 1.69%
Solana Beach – .85%
Del Mar – .85%

Write in a city or county area if you are not a resident of a listed city:
Was Oceanside now Fallbrook
San Clemente
Fallbrook
San Diego
Valley Center
Phoenix, AZ
Fallbrook and Oceanside
Atlanta, Georgia

Please prioritize the following list of bikeway improvements with "1" being the most important and "6" being the least important. Do not duplicate rank assignments to multiple bikeway improvements.

Provide more bike trails separated from roadways.
1 - 54.03%
2 - 8.06%
3 - 9.68%
4 - 5.65%
5 - 4.03%
6 - 18.55%



Provide more on-street bike lanes painted on roadways.
1 - 29.84%
2 - 15.32%
3 - 25.00%
4 - 13.71%
5 - 12.10%
6 - 4.03%

Provide more on-street bike routes (no painted lanes, just signs).
1 - 9.68%
2 - 9.68%
3 - 12.90%
4 - 14.52%
5 - 16.13%
6 - 37.10%

Provide wider shared lanes on existing roads (no lanes provided).
1 - 16.94%
2 - 14.52%
3 - 19.35%
4 - 13.71%
5 - 17.74%
6 - 17.74%

Fix problems with existing problem streets and intersections.
1 - 27.42%
2 - 15.32%
3 - 15.32%
4 - 18.55%
5 - 16.13%
6 - 7.26%

Create a more interconnected system by filling in missing gaps.
1 - 35.48%
2 - 22.58%
3 - 14.52%
4 - 8.87%
5 - 8.06%
6 - 10.48%

Please rate the following list of improvements as High, Moderate, or Low priority in terms of whether they would convince you to commute by bike in Oceanside more often.

Provide trails separated from the road and busy traffic.
Low - 10.48%
Moderate - 16.94%
High - 72.58%

Emphasize safe routes to schools and to local parks.
Low - 17.74%
Moderate - 33.87%
High - 48.39%

Provide more bike lanes on safe streets.
Low - 8.06%
Moderate - 32.26%
High - 59.68%

Mark safe routes on low volume/low speed streets.
Low - 15.32%
Moderate - 48.39%
High - 36.29%

Increase maintenance along routes, removing potholes and debris.
Low - 8.94%
Moderate - 34.15%
High - 56.91%

Provide more multi-modal connections with other transit facilities.
Low - 21.77%
Moderate - 40.32%
High - 37.90%

Insist that large employers provide showers and bike lockers.
Low - 42.74%
Moderate - 37.10%
High - 20.16%

Concentrate on problem intersections and high speed on/off ramps.
Low - 9.68%
Moderate - 36.29%
High - 54.03%

Improve public education with an emphasis on sharing the road.
Low - 10.48%
Moderate - 28.23%
High - 61.29%

Improve intersection bike loop detection systems.
Low - 9.68%
Moderate - 50.81%
High - 39.52%

You will be presented with a series of questions regarding whether you participate in certain activities, and if so, how often you participate in them, and during what time of the day.

Are you currently participating in Cycling for Transportation?
No - 57.26%
Yes - 42.74%

How often do you currently take part in Cycling for Transportation?
24.53% - Daily
37.74% - 2-3 Days per Week
22.64% - Weekly
7.55% - 2-3 Times per Month
3.77% - Monthly
3.77% - A Few Times per Year

When do you like to Cycle for Transportation?
Weekday Mornings - 36.52%
Weekday Days - 11.30%
Weekday Evenings - 26.96%
Weekend Mornings - 7.83%
Weekend Days - 13.04%
Weekend Evenings - 4.35%

Are you currently participating in Cycling for Exercise or Sport?
No - 6.45%
Yes - 93.55%

How often do you currently take part in Cycling for Exercise or Sport?
13.79% - Daily
44.83% - 2-3 Days per Week
25.86% - Weekly
9.48% - 2-3 Times per Month
2.59% - Monthly
3.45% - A Few Times per Year

When do you like to Cycle for Exercise or Sport?
Weekday Mornings - 19.20%
Weekday Days - 15.63%
Weekday Evenings - 8.93%
Weekend Mornings - 27.68%
Weekend Days - 25.00%
Weekend Evenings - 3.57%

Are you currently participating in Cycling for Recreation?
No - 16.13%
Yes - 83.87%

How often do you currently take part in Cycling for Recreation?
3.85% - Daily
39.42% - 2-3 Days per Week
27.88% - Weekly
14.42% - 2-3 Times per Month
5.77% - Monthly
8.65% - A Few Times per Year

When do you like to Cycle for Recreation?
Weekday Mornings - 14.86%
Weekday Days - 14.86%
Weekday Evenings - 8.00%
Weekend Mornings - 24.00%
Weekend Days - 34.29%
Weekend Evenings - 4.00%

Are you currently participating in Cycling for Social/Family Activity?
No - 43.55%
Yes - 56.45%

How often do you currently take part in Cycling for Social/Family Activity?
2.86% - Daily
15.71% - 2-3 Days per Week
30.00% - Weekly
20.00% - 2-3 Times per Month
21.43% - Monthly
10.00% - A Few Times per Year

When do you like to Cycle for Social/Family Activity?
Weekday Mornings - 10.43%
Weekday Days - 9.57%
Weekday Evenings - 4.35%
Weekend Mornings - 29.57%
Weekend Days - 40.87%
Weekend Evenings - 5.22%

Are you currently participating in Running on Multi-Use Paved Paths?
No - 71.77%
Yes - 28.23%

How often do you currently take part in Running on Multi-Use Paved Paths?
11.43% - Daily
28.57% - 2-3 Days per Week
28.57% - Weekly
17.14% - 2-3 Times per Month
8.57% - Monthly
5.71% - A Few Times per Year

When do you like to Run on Multi-Use Paved Paths?
Weekday Mornings - 22.22%
Weekday Days - 11.11%
Weekday Evenings - 12.35%
Weekend Mornings - 29.63%
Weekend Days - 16.05%
Weekend Evenings - 8.64%

Are you currently participating in Walking on Multi-Use Paved Paths?
No - 62.90%
Yes - 37.10%

How often do you currently take part in Walking on Multi-Use Paved Paths?
19.57% - Daily
28.26% - 2-3 Days per Week
28.26% - Weekly
13.04% - 2-3 Times per Month
4.35% - Monthly
6.52% - A Few Times per Year

When do you like to Walk on Multi-Use Paved Paths?
Weekday Mornings - 13.83%
Weekday Days - 22.34%
Weekday Evenings - 18.09%
Weekend Mornings - 15.96%
Weekend Days - 19.15%
Weekend Evenings - 10.64%

How did you hear about this work?
66.13% - Flyer
4.03% - Newspaper
10.48% - Internet
12.90% - Word of mouth
6.45% - Other

To summarize the comments, the most common issue raised was the expansion of Class 1 bike paths throughout the city. A major improvement based on the survey was extending the San Luis Rey River Trail thru Guajome Park to connect to the Sprinter Rail Trail and to complete the Sprinter Rail Trail and Coastal Rail Trail. Complete connections and facility gaps was another common concern to improve the overall the bicycle system within the City. Connections would include allowing bikes on the Sprinter as a multi-modal option, safer highway and railroad crossings and better intra-city bike path connections as well as connections to adjacent cities. Education for both the cyclist and drivers was a concern and more outreach is wanted to improve public awareness. Maintenance is also a concern with all the bicycle facilities in terms of sweeping, cleaning and fixing road surface problems. Bike storage facilities are wanted at all shopping centers to encourage bike use and a safe place to lock up bikes.

The survey comments are sorted by newest to oldest.

105. Provide connected bike paths or lanes protected from traffic to parks/beach and other transportation centers (Sprinter/Coaster stations) Have businesses support biking by providing bike-lock stands.

104. The merge at the entrance to Pendleton is very dangerous.

103. Path: Get the obnoxious club riders under control! Get the obnoxious club riders under control! Rules signage. Patrols control dogs on paths doenterprises@yahoo.com

102. Sweep paths more, prohibit glass on paths, educate participants on proper path behavior.

101. 1) At the West end of hwy 76, please connect the bike path to Mission Ave instead of requiring a long ride under the bridge to get to Mission Ave from the other side. It's a very long way around and back up a steep hill. Crossing the 5 offramp at the end of hwy 76 is too dangerous. 2) Please connect the west end of the Mission trail through to the harbor. It's really not dangerous to go under the railroad bridge on the trail. That's over-doing it with the safety restrictions. The way around through town is very long and much more dangerous than the trail would be. thanks!

100. I really agree with the need for increasing education about "Sharing the Road". I feel that cyclists and drivers would both benifit from a clearer understanding of right of way practices.

99. For the future, a bike lane (path) should be provided that would connect Harbor Dr and Las Pulgas when Camp Pendleton is on HIGH ALERT and off limits to cyclists.

98. Provide more bike racks and hard points for locking bikes at malls, shopping centers, grocery and drug stores, bike loops at Mesa and Mission – Barnes and Mission in left turn lane, Brooks and Mission in left turn lane.

97. There is a culvert near harbor by the new condo development that have homeless living in it that like to throw glass bottle, etc on bike path. We fine we must walk this area because of broken glass.

96. Extend bike trail all the way along San Luis Rey River to I-5.

95. Please continue to coordinate with neighboring cities so trails will be available and connected. Put a fire under the folks in Vista.

94. Develop an interconnected series of paved bike paths separate from streets but bridged where necessary by public streets. It would be even more helpful if they were interlinked with communities of Vista and Carlsbad.

93. Connect river to Guajome/Jefferies R. Break-ins at River Trail Parking. Harbor Access.

92. I would like to see more dedicated bike lanes that are safe.

91. We need many more designated bike lanes on city streets. Glass, palm fronds, and other debris needs to be picked up promptly. We also need more bike paths throughout the city. These should exclude car traffic. Thank you for your attention to this issue of safe biking in Oceanside.

90. Widen coastal bike trail (Cassidy to EMD)

89. 1) Make safe 2) Interconnect with rail, bus, etc. 3) Have parking facilities for bikes that ensure safety of bike

88. We need the Escondido to Oceanside Sprinter Class 1 Facility!

87. If we want more people riding bicycles we must educate our younger kids on the importance of cycling. A lot of our children are overweight. A lot of the younger kids like to ride a BMX style bike to start on. A lot of my customers want to have a skateboard park that they can ride their bikes. Having a place to ride will keep them riding. Then when they get older, they'll continue to ride their bicycles.

86. The goal should be to increase bike use, not improve facilities. Migrate the economic discrimination resulting from off-street parking ordinances. Car parking at work is expensive so it decreases wages. Cyclists do not use the car parking. Amend the off-street parking ordinances to define and reward cash out.

85. Maintain the surface of the existing bike path

84. More bike trails away from roadway & extending the San Luis Rey Bike Path

83. Would need to have bike racks at retail locations so that people can ride to the grocery store, etc. Currently I may be worried that my bike would be stolen if I ride to the store. Secondly, I think that the car drivers need to be educated. I do not feel safe riding around southern California drivers because they are not used to looking out for bicycles. Much different from riding in Northern California where biking for transportation is more of the norm.

82. Provide more spots for bikes on the Coaster & Metrolink Trains. Provide more covered lockers for bicycles. Sponsor more community bicycle events.

81. Thanks for your efforts
80. Get the bike path off of the public streets. In the first place it is not good to inhale auto exhaust any more than you have to. If the exhaust doesn't kill you the cars will. Bike travel should be encouraged. Putting a bike path on a high speed street does not do that!

79. We need more dedicated bike paths. With traffic the way it is - nobody feels safe sharing the road with vehicles.

78. Improve connections of off road paths and provide paths to major shopping centers

77. Obviously, more paths for bikes separate from automobiles is ideal. Better and wider bike lanes with no pot holes, rough pavement, or excessive debris is also quite desirable.

76. The flyer enclosed in my Water bill received today (2/4) was for a meeting last weekend (2/2). How unfortunate to not provide adequate notice to interested citizens. It would be great to make our river pathway/paved trail safe. As a mom exercising with young children I find the River path very unsafe and frightening.

75. Heading north/south on El Camino when crossing over Hwy 78 is extremely dangerous. This area needs improvement. Also, there are a number of pot-holes in bike lanes.

74. I would like to see the San Luis Rey river trail extended to Guajome Park. Overall, I'm pretty happy with the bicycle situation in Oceanside!

73. If better connections are made to the future Sprinter route and bike lockers and space on the Sprinter is dedicated and guaranteed, I will use the two together as transportation to work since I have a Sprinter location close enough to bike to at work and home. But it's too far to walk and if I'm already in my car, I'll drive the whole way (10 mi). It's not going to save any money to ride the Sprinter, but I'd do my part if I could ride my bike to the Sprinter station and be guaranteed a spot for it on the train.

72. Provide inter-connected routes, preferably separate from roads or on low volume, low speed roads.

71. You might consider rerouting the southern section of the Downs St route. Avocado above Ivy Rd is quite steep and has a very blind curve. Reroute to Ivy which turns into Downs. Both are wide and less steep. FYI I am a former trail coordinator for the City of San Juan Capistrano.

70. Better signage of bike routes, better street routes if possible or make bike cut thru connections(bike & pedestrian path only) if possible. Have business strip malls provide bike racks, some have none at all, it is very easy to pick up locked bike when no pole is there to wrap your lock cable.

69. Need a bike route near the pier area. Coast Highway is too busy.

68. Need safe paths, separate from dangerous roads to allow cycling throughout the city and connecting to other communities and to the coast. Bike paths need to be respected by drivers as a safe zone for cyclists. Debris such as broken glass needs to be cleared from pathways. We need safe bikeways to schools, parks and to public transportation. We need businesses and new construction to help support these needs.

67. Education on cycling etiquette for users of multi-use pathways.

66. Safety improvements needed to bikeways on: - Vista Way between El Camino Real and College Avenue; and - Intersections/traffic lights at El Camino Real and I-5.

65. I live in the Fire Mountain neighborhood. My wife and I would like to ride our bikes but don't feel anywhere hear is safe. I hope your plan will include painted lanes on streets that are relatively safe to travel on taking into consideration such things as shopping destination, recreation destinations and general transportation corridors. We are in our sixties so we're have to be thinking more about safety, traffic hazards, etc. before we're willing to get back on our bikes.

64. Add dedicated (separated from roads) bike paths: Oceanside to San Diego, Oceanside to Escondido, etc., etc. etc. The more bike paths, the better!

63. I would love to see some more trails for use by mountain bikers in the open space within the city limits. It would also be great to have trail maps posted at trails heads and/or made available online.

62. Extend the San Luis Rey Bike path north of College Ave so bikers do not have to ride on the 76.

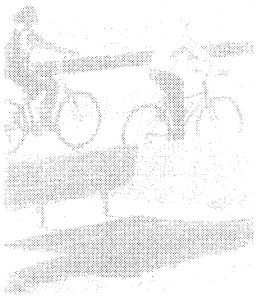
61. Bike Routes on 2 lane high speed roads such as North River Road east of Stallion and Sleeping Indian Road need more signage to educate drivers to expect and pass cyclists safely. Pacific Street should be marked with "Sharrows" to show cyclists where to ride (outside the door zone) and to educate motorists on where to expect cyclists. KEEP CLEAR should NOT be used at non-signalized intersections on multi-lane roads such as College Blvd. where insufficient sight distance from left turn lanes to the Class 2 Bike Lanes does not exist. Worst example is College Blvd. southbound at the Rancho Del Oro shopping center. Northbound Douglas at North River Road should be restriped to provide for Class 2 Bike Lane passage for cyclists continuing north on Douglas. One of the two right hand turn lanes should also be eliminated make space for the bike lanes and to reduce collisions between motorists, pedestrians, and cyclists. North Santa Fe at 76 needs bike lane striping for left turning cyclists. This will likely require two left turn only lanes plus a straight/right turn only lane in addition to the bike lane striping. The bike lane striping on Fousatt northbound at 76 is on the wrong side of a right turn only lane. Striping for northbound cyclists also needs to be included. Bike lane striping on southbound College under 78 needs to be removed and moved over to line up with the existing lane which is correctly positioned to the left of the next right turn only intersection (Plaza Drive). Some kind of guidance for southbound cyclists and notice to motorists is required for the two right turns onto westbound 78 (shared lane markings?) Pacific Coast Hwy. should become a "Complete Street" for all users by reducing it from two through motor vehicle lanes each way to one and by adding a two way left turn lane in the middle plus Class 2 bike lanes on each side located outside of the door zone. El Camino Real from Mission Road southbound needs a Class 2 Bike Lane. If there is insufficient room in the center divide then one of the two traffic lanes should be removed. The bike lane striping on southbound Melrose just past Oceanside Blvd. is confusing and needs to be restriped if there is a right turn only into the Arco Station. Directions from and to the Cleveland Street entrance to the SLR Bike Trail need to be more prominent, especially for directions to the NCTD Train Station.

60. Need more separate bike routes and connectors, also need to monitor the E/W to beach route for men soliciting other men, weird activity going on. the rocky steep shoulder could be a hazard for someone to get hurt if they fell off and tumbled down onto the rocky shoulder. Can this be fixed?

59. Fix road edges and fix North River Rd and Sleeping Indian

58. When I used to live in Oceanside I would commute to work. The part of that commute I enjoyed least was negotiating along the beach front road in the evening, especially during the summer, on my way to the San Luis Rey River bike trail. If a separate bike path was built along the railroad track that would fabulous.

57. Enforce no parking in bike lanes. Make sure that all intersection traffic lights will change when a bicycle is waiting for the light to change, that includes the green arrow for a left turn. Educate motorists about proper behavior ie: NOT throwing objects at bicyclists to purposely injure them, shooting at cyclists with bb guns, pellet guns, paintball guns and other weapons, purposely running cyclists off the road, screaming at cyclists, flicking lit cigarettes at cyclists, etc.



56. Link public transportation with bicycle master plan. For example, I live 5 miles from the beach, and when the Sprinter begins running I'm thinking I'll be able to take my bike on it and ride it along the strand and beyond into Del mar.

55. Improve conditions of trails, extend river trail. Consider adopting "yellow bikes" like NY--free bikes available around the city. If you need a bike you use a yellow bike and then leave it for someone else to use when they need one. Are you familiar with it? Bikes are donated and used by the general public for free--they're not owned, they're shared by all the citizens.

54. I ride from Oceanside to Carlsbad for work. The biggest challenges for me are the short bike path near the coast - it's too short but I like it. However coming into Oceanside that area near Vista Way is a challenge... cyclists cut across coast highway if headed to the beach and for me I have to stay an extra block with possible parked cars to head inland North of Vista Way. I'd like to see the main bike path from the coast to college extended. Overall I like Oceanside as a place to bike when away from the coast.

53. North river road needs to be improved. Pacific Street needs some room for bikes.

52. I ride the San Luis Rey Bike trail every day to work - one of the best bike routes in all of San Diego. But every day I have to get off the trail and take Highway 76 from College - very dangerous. It is very important to finish the San Luis Rey trail all the way to Guajome Park - both for the commuters and for people that camp/recreate at the park. The San Luis Rey trail is Oceanside's' best secret - but it could be a great tourist attraction.

51. 1. Safer crossings of Hwy 78 (at College, Jefferson, and El Camino Real) are essential to increasing bicycle commuting. These areas are death traps and currently prevent several individuals I know from commuting by bicycle. 2. a better/safer connection to Bonsall (via 76 or North River Road) is essential to safe and expanded use of the bicycle route network in Oceanside. 3. Cleaning debris from bike lanes, particularly on well trafficked streets such as 76, college, or Mesa would also increase the safety of travel in these areas.

50. More dedicated bike trails would be very helpful to get cyclists out of traffic. However the trails have to go somewhere, there are segments of the "rail trail" close to Buccaneer park that are completely useless. A cyclist can easily cover 30 - 50 miles in a recreational ride, and a 500 yard long trail just dumps you out into a difficult traffic situation. Make the pathways useful for transportation and people will use them!

49. Bike routes near the beach need to be safer. I do not feel safe on most of the streets near the beach because of small lanes and few designated bike lanes.

48. I think taking this step is a great start and I commend you on it. There have been many positive changes in your city. I hope we can do it in Fallbrook.

47. Would like to see the river bike path extended

46. Improve diver awareness

45. I observed in Europe how bike paths separated from roads were in wide use and packed with commuters

44. Inland rail trail to Oceanside

43. Motorist education

42. I am not too sure about Oceanside.

41. Extend the San Luis Rey bike path. Provide bike lane on Pacific Street. Safer passage for bikes on Coast Highway. Raise awareness of riding a bike as a mode of transportation.

40. Sweep bike lanes more often. Complete bike lane on So Coast Hwy. (eliminate parking if necessary). Allow stand on motorized scooters on bike paths as CA law allows.

39. Thank you for the bike lanes. I ride to work on Oceanside Blvd daily. It is so much safer than before. The main improvement I would like to see is more bike lanes and wider roads where there are none so we can have room to get around without driving our cars. Thanks.

38. I would like to see more bike paths away from traffic in safe areas that I could ride my bike either with friends and family or alone. I do not feel safe riding along the San Luis Rey River bike trail alone.

37. I think Oceanside has to be a little more forward thinking in its approach to providing bicycle transportation options. Roads need to be designed with bicycling in mind so people have options to get around. I use the river bike path on occasion. There are always many people using this for running, walking and bicycling. Oceanside should develop more of these as we continue to build out the city, it provides many benefits to it's citizens.

36. We need a first class bike path. We should have a path that will be the bench mark for other cities. My kids and I need and want to have a safe place to ride. I really beleive a good bike path would improve Oceanside for more then just bicyclist, It would attract tourist and help businesses and in turn bring money into the area. Thank you for this survey, John Ringlever

35. Would like more bike trails off of the road like the San Luis Rey Bike Trail. We love that trail and would especially like more by the beach and harbor.

34. More education for car drivers to encourage them to share the road, and pay attention while driving, i.e. stop using cell phones and other distractions

33. Teach motorists that they have a responsibility to share the road and to watch out for and respect bicyclists. I have been in more than one vehicle-related accident and escaped many others. I am a careful motorist and bicyclist.

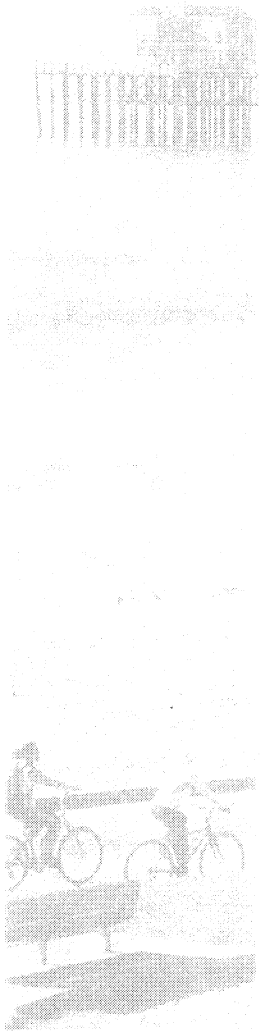
32. The City is not bicycle (or pedestrian) friendly at all! Our family cannot & will not ride our bikes on the streets of Oceanside because we are placing our lives at very high risk of being hit. The City needs bike sidewalks away from the traffic lanes. We would also love to have a bike/walk trail along the Sprinter rail line!

31. Add safe bike lane to 101!!

30. Maintain class 2 paths clean of debris. Educate drives to share the road. Provide education for school age riders, Have City planners consider bicycle commuters when designing/ improving road ways.

29. Clear debris on bicycle paths & repair potholes, etc.

28. Please provide a pedestrian/cycle crossing for the rail tracks at Neptune Way. This will provide access to the beach and harbor that is not only convenient, but certainly safer than through the intersections. People do not always stop at the stop signs and become impatient if they have to wait. During peak seasons, drivers are also held up by the numerous people



trying to access the beach and amenities.

27. I would like to see a bike/walking trail connecting the San Luis Rey river trail and the Carlsbad bike/walk trail along the rail road tracks near the coast.

26. We need better signage at the bike trail along the coast and a bikeway system map.

25. There simply needs to be more available to cyclists. The river trail is great, but quite short. A trail system would be ideal. Something along Oceanside blvd and the sprinter route would be great.

24. If we had a good SEPARATED bike path system (like they have in Denmark for example) many more people would participate. In Denmark, almost everyone owns a bike and uses it almost daily- but only because it's safe to bike when the paths are separated from cars. With separate pathways even old ladies, little kids and parents with babies use their bikes. I'm glad you are starting work on this. It is needed. Linda

23. I stay inside on a treadmill. If there were nice, safe, separate bike only (nature) paths around town and to the train stations I would bike everywhere or walk.

22. I love the bike path along the San Luis Rey River. It would be wonderful to have an access point at the bottom of Canyon... there is a little track up the bank, but it is a heave to get the bikes up the bank and out onto the road. It is a busy road, but maybe wide enough for a bike path. And it is possible to ride a bike up Canyon! That would make the bike path more accessible to people in the Loma Alta neighborhood. Please consider it Thank you

21. Paths do not connect...heavy traffic on the strand. The strand should be limited to bikers, walkers and residents vehicle ONLY.

20. There should be more dedicated bike lanes and more education for cyclists. Many want to have it both ways, using rules for pedestrians (riding on the sidewalks) and then riding on the road, but not obeying the rules of the road. I want Oceanside to be bike friendly, but I want the cyclists to be safe and more respectful of the law.

19. Improved maintenance of bike lanes. Improve network of bike lanes. Better street sweeping of bike lanes. Do not allow utilities to use bike lanes for construction, or if necessary repave entire bike lane to eliminate seams and ruts in lane.

18. I notice that many group bicycle riders commonly violate basic traffic laws,(stop signs, lights, and lane obstruction).

17. Provide safe cycling so that people can commute to work, commute to the beach/downtown. Need to provide a secure place/s to park bicycles downtown.

16. We need be bike paths separate from the road. We need a long running bike path next to the Coaster and Sprinter tracks, please.

15. More bike trails separated from roads and more definition of bike trails on shared roads. There needs to be a connecting bike train between O'side and Carlsbad Village

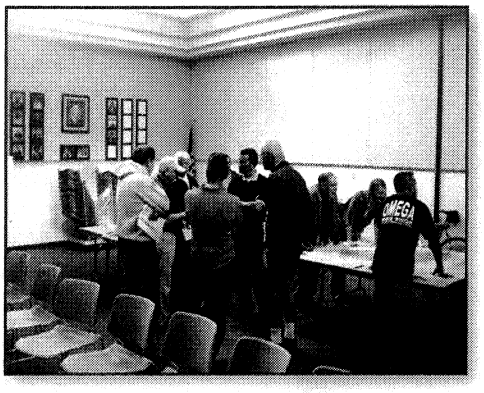
14. Existing Bike lane on Vista Way is not safe. Too narrow and too much junk on the bike lane.

13. More connection between the trail gaps and more designated bike lanes
12. WE need safe routes along major traffic corridors. I suggest a bike path that runs along the rail lines.

11. Concentrate on more marked bike lanes on existing and new streets.

10. More Share the Road signs

9. High traffic times and multiple deaths caused to cyclists from car crashes at unsafe areas have deterred me from riding. Please make it safer for us to use our roadways!



8. I think we need a bike/pedestrian crossing at Neptune and the rail line for better harbor and beach access.

7. Make biking safer by having more paths and signs

6. I bike into and out of the front gate of Camp Pendleton. That freeway off ramp is very hard to navigate and might cause an accident.

5. The traffic on PCH virtually eliminates that street. During the summer the tourist traffic in the downtown area is just plain dangerous! City has NOT done any planning for traffic let alone included the safety for bike riders. The Harbor is also not well planned especially during tourist time!

4. Biking into Camp Pendleton main gate through the I5 Merge is very dangerous. Pacific Street needs bike lanes.

3. Repair roads, increase safety for cyclists and runners. I experience serious harassment regularly and get run off the road (riding AND running). Educate the general public although motorists really don't care and use their cars as weapon.

2. More East West connections. More signage (Share the Road) more education.

1. The bike path is great. Any upgrades to the current system is excellent. So many people cycle in this area.

A letter mailed on January 14, 2008

I will be out of town for the Feb. 2nd meeting. I have attended a small meeting before with Mr. LaGrange and Nathan Mertz. I expressed my concern on safety and the need for "Single File Passing". We ended up with the decision to paint the dotted center line which now exists. However the biggest safety problem still exists ....namely, two riders riding abreast and not riding single file when passing.

Even with the new center line two riders still ride abreast. The inside rider does attempt to keep their tires on or just inside the line. Their handle bars, elbows and shoulders then extend over 1/3rd of the oncoming lane. I am an experienced rider and have no problem moving way over to accommodate this behavior but since I ride this path four times a week for the last three years I have seen the following happen over and over again with or without the center line. What I repeatedly observe is:

Two riders riding abreast always makes the oncoming rider go over farther than they would like to make room for them. I have seen mom's with kids in tow with those trailer extensions have to pull onto the extremely narrow shoulder and then watched their trailer jack knife over the edge because of it. I have seen families with little kids learning to ride move over for the two abreast riders and then fall because they got scared that there still wasn't enough room. I have seen outright accidents because a rider had to move so far over for the two abreast riders that they really did go down.

What is needed is a simple signage-road stencil that says.... "Single File When Passing". In addition the Kiosk rule #5 currently reads.... "Users should ride no more than two abreast" this is extremely misleading and is only adding to the problem.

I can guarantee you that this is the number one safety problem on the path. Again, I ride the path four times a week for the past three years. Nothing comes close to this issue when it comes to safety. So I urge the committee to please take this seriously.

I have offered before and will now offer again now to pay for the road stencil, the yellow paint too, and will go out there and paint the stencil myself so the city incurs no expense. i would only need your official OK and to do so.

I have enclosed a rough drawing of the stencil idea as well as a few suggestions for the kiosk #5 Rule. Please feel free to contact me with any thoughts and questions.

Most Sincerely,

Larry Groupe

<u>Kiosk Rules Sheet - Item #5</u>

5. Ride Single File When Passing Traffic in Either Direction

OR

5. Ride Single File When Passing Traffic in Same or Opposing Lane

OR (simply)

5. Ride Single File When Passing

Workshop #2 Summary

The second workshop was conducted on May 10th at the Oceanside Public Library. Twenty people attended this final workshop to discuss the proposed routes recommended in this plan and to add, remove or alter recommended routes. The four Es were also discussed on presentation board; Education, Enforcement, Engineering and Encouragement. There was no presentation as the setup of this workshop was an open forum where the attendees can discuss issues and concerns with the consultant team and City staff. Two large plots of the recommended facilities were laid out on tables for attendees to add comments.

Comments from the workshop maps are as follows:

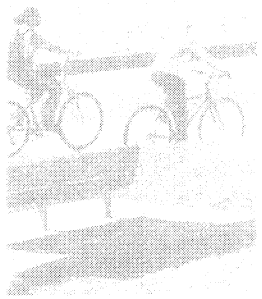
1. Need bike lane on Mission Blvd over/under I-5
2. Designate Coast Hwy as a Class 2 the full length
3. Add connection from Cassidy to Vista Way at edge of Caltrans ROW.
4. Connect Class 2 on Douglas between Mission and SR-75
5. Joint use off-road at Calaveras Lake Park with Carlsbad
6. Lost bike lane (at Old Grove Road and Mesa Drive)
7. Add left turn only bike lanes to the right of the rightmost vehicle left turn only lanes at North River Road and Vandergrift and on College Blvd at North River Road
8. Change left/straight only lane at N. Santa Fe and SR-76 to left only bike lane onto SR-76. Change the right turn only lane to right/straight lane
9. Make Old Ranch Rd and Class 2 to connect to Guajome Park.

The following are online survey comments between the two workshops. The survey comments are sorted by newest to oldest and are shown in verbatim as they were inputted.

133. !!!!!!!!!!MOST IMPORTANT!!!!!!!!!!!!! I am a City of Oceanside employee who bikes to work from Cardiff. The MOST DANGEROUS portion of my entire commute route by far is just after I cross over the lagoon on Coast Highway entering South Oceanside while headed North. Trying to make the left hand turn at the corner by Angelo's is difficult even at 7am in the morning for several reasons....the turn is on an uphill slope, there is no painted or indicated turn lane or even a center meridian, and there is both front and rear HIGH-SPEED TRAFFIC....THE WORST OF WHICH IS SOUTHBOUND WITH THE O'SIDE SPEED LIMIT NEEDLESSLY POSTED HIGHER (5 MPH) THEN ON THE OTHER SIDE OF THE LAGOON IN CARLSBAD. PEOPLE ARE ACCELRATING FAST RACING OFF OF VISTA WAY/78 AND GOING EVEN FASTER ON THE DOWNHILL INTO CARLSBAD OR INCREASING SPEED NORTH-BOUND WITH THE HIGHER SPEED LIMIT IN O'SIDE WHILE HEADED TO VISTA WAY/78. (AND A BIKER CAN'T TRIP THE LIGHT TO TURN LEFT A BLOCK UP AT PCH AND VISTA WAY WHILE ALSO RISK BEING PICKED OFF BY SOMEONE FLYING GOING WEST TO SOUTH AT THIS INTERSECTION.) PLEASE ALIGN THE SPEEDS, PUT TRAFFIC CONTROL, SPEED DETERNETS, POLICE WITH RADAR, WHATEVER IT TAKES. OVER THE BRIDGE AND WHERE IT GOES FROM TWO TO ONE LANES BOTH DIRECTIONS ARE JUST ACCIDENTS WAITING TO HAPPEN....BIKERS, WALKERS, PEOPLE FISHING, ALL ARE HIGH-STAKE VICTIMS. I WOULD PREFER THAT NO ONE IS PUT AT RISK...ESPECIALLY ME!!! And this is at 7am weekdays.....it only gets worse during the day and especially on weekends when the biker volume goes up dramatically. Thanks for listening. In my mind this is, needlessly, the most dangerous bike intersection/area in the City by far. I would appreciate hearing from you about solutions to this problem.

132. Freeways exits/intersection must have more bike lanes and sings for passing cars because drivers are such in a hurry to get on the freeways and don't care about people in bikes.

131. Improve bike lanes on the 101 between the harbor to Buena Vista Lagoon. Also, a bike path paralleling the Sprinter track would be great.



130. I would like to see something like the 56 freeway interconnect all of North County from La Jolla to Oceanside. I understand the cost would be absurd but in the meantime could we please educate the public on road sharing.

129. MAKE THE PATHS FEEL RURAL AND QUIET AND MAKE SURE THEY ARE SAFE

128. Integrate with transit and emphasize local businesses. For example, if we had an easy to follow trail from the transit parking structure to the river trail, the city could put a code at the bulletin boards along the trail that would be good for discounts at local businesses. Current trail parking is adequate, but the location doesn't encourage after-ride patronage of downtown businesses.

127. People in general don't seem to understand how to share roads with cyclists, nor do a lot of people seem to understand how to share a paved path (cyclists vs. pedestrians/runners). I do both so I am not commenting on the side of one or the other. Personally, I run & cycle defensively, but I am more afraid that others will cause me to have an accident because of unsafe, inconsiderate walking/cycling. Families out walking seem to walk 3-4 abreast just expecting bikes to dodge them, and there are a lot of cyclists who act as if the paved path is a "time trial" lane and everyone should just move far out of their way. Education on everyone's part would make using the paths more enjoyable for everyone: both on foot and on a bike.

126. Try to connect bikes with public transit.

125. The prior questions pretty much covered it.

124. Oceanside needs paths that are more easily accessible to cyclists and that are better maintained. I understood that there would eventually be a path that followed the Sprinter route. That would be great to see. For years I have been hearing about a coastal rail trail, but so far have seen nothing more than an asphalt sidewalk produced in south Oceanside. It would be nice to see something better come of that. Coast Highway could also use a bike lane that travels the entire length of the city, rather than starting at Oceanside Blvd and running 1/2 mile before terminating. I don't even see the purpose of that.

123. Riding along Coast Highway is a nightmare! Aggressive drivers, no shoulder, insufficient width to stay out of parked car "door zones." The marked bike route, closer to the coast, is marginally better, but again, the streets are narrow, the cars and pickups are wide.

122. Lowering speed limits to 35mph and less would go a long way in convincing people to ride bicycles.

121. We'd really like to see the San Luis Rey River bike path get connected to the rail bike path as soon as possible. That will enable us all enjoy the ride down to San Diego and back.

120. I feel that better training/awareness of the rules for drivers and cyclists are most important. Second to that, I think we need to be more sensitive to the quality of the roads for cycling. They can be uncomfortable and sometimes dangerous. This is often a workmanship issue.

119. Reverse the trend to eliminate bike lanes at intersections and freeway crossings in favor of vehicle turn lanes. Connect Cassidy St. to Vista Way along the Caltrans ROW of I-5 and route 78. Connect the River Trail to the eastern city limits, future county park trail.

118. Safer connection between bike paths IE. river path to Coaster path. Better care of street paths. Some of the sides are so bad I have to ride in the street to avoid the potholes.

117. Increase presence on off-street bike paths so it's not scary to ride on them (i.e. enforce leash laws)

116. Provide more off-road mountain bike trails with parking at trailheads.

115. I'd love to have a bike path where the sprinter is running. Paved and at least two lanes, east and west bound.

114. The grades on many underpasses are too steep for other than bicycles. There are a variety of adult Tricycles in use now. Some with foot pedeling and others with arm. These trikes are heavier that most bikes. Also, many people with wheelchairs use the bike paths. Thanks! Jimmie R. Wynn 760-435-9388.

113. Needed: Restrooms and Slow down signs! We often use the San Luis Rey Bike path. Our child rides single file between the adults. A few very fast riders have stopped us and advised us not to bring children on the Bike path. They were rude to our young son, indicating the path was for racing only. If indeed this is a family use path, could we note that with signs. Also...there are no restrooms along the path. Possibly soon with the completion of the park?

112. I would like to see the rail trail systems along the coast and along the sprinter route be completed with bike paths separate from auto traffic.

111. We would like to see the San Luis Rey bike path connected to the rest of the Rail Bike Path along the rail road track.

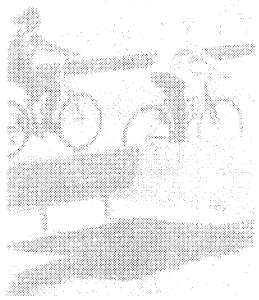
110. I really agree with the need for increasing education about "Sharing the Road". I feel that cyclists and drivers would both benefit from a clearer understanding of right of way practices.

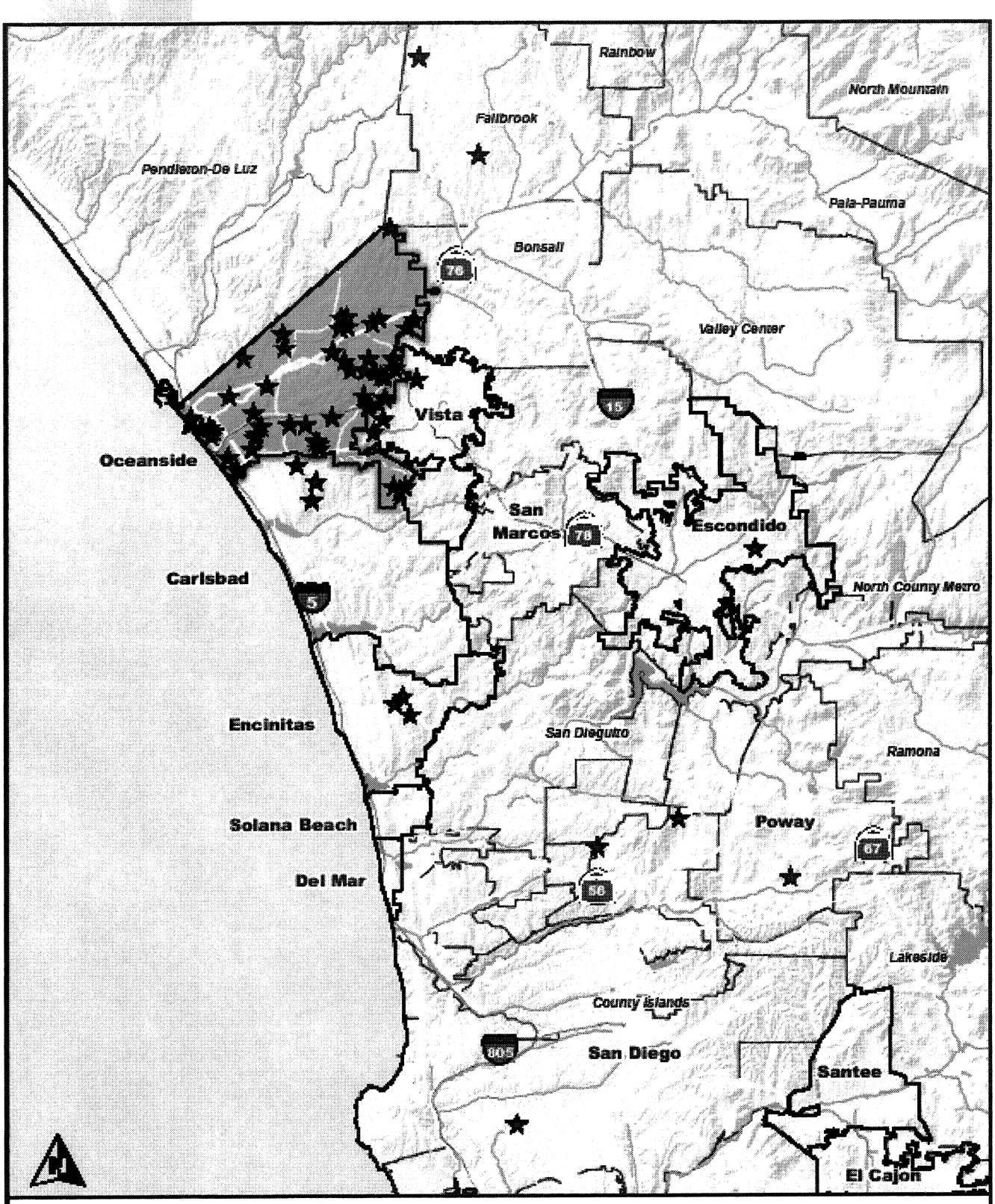
109. 1) At the West end of hwy 76, please connect the bike path to Mission Ave instead of requiring a long ride under the bridge to get to Mission Ave from the other side. It's a very long way around and back up a steep hill. Crossing the 5 off ramp at the end of hwy 76 is too dangerous. 2) Please connect the west end of the Mission trail through to the harbor. It's really not dangerous to go under the railroad bridge on the trail. That's over-doing it with the safety restrictions. The way around through town is very long and much more dangerous than the trail would be. Thanks!

108. Sweep paths more, prohibit glass on paths; educate participants on proper path behavior.

107. Path: Get the obnoxious club riders under control! Get the obnoxious club riders under control! Rules and signage. Patrols control dogs on paths doenterprises@yahoo.com

106. The merge at the entrance to Pendleton is very dangerous.





★ Distribution of Workshop Participants

Workshop Attendance

Data Source: SANDAG, SanGIS & KTU+A (2008)

SHARE
THE
ROAD

Appendix C: Guidelines for Selecting Safe Routes to School

Choosing a safe bicycle route to school is different from choosing a safe walking route because bicyclists and pedestrians have different needs for maximum safety. The higher speed of bicyclists increases the need for visibility, smooth surfaces, and predictable interaction with other road users.

Note also that bicycle skills vary among students more than walking skills do, and they are usually acquired at a later age. Younger children have less skill at estimating closing speed for automobiles and have less ability to process peripheral vision. Younger children should therefore cycle mainly on less complicated streets, where they can focus on one hazard at a time. Older students will cycle faster, and so they need to have longer sight lines. Routes suitable for high schoolers may be unsuitable for elementary school students, and vice versa.

Publishing recommended routes to school is not sufficient for encouraging bicycling to school. Other measures are also needed, including bicycle education, safe bike parking, rewards for cycling (such as bike-to-school days), bike-to-school groups lead by an adult, and so forth.

When choosing safe bicycle routes to school, look for:

- The safest, most direct route. Detours to avoid hazards should not add significantly to the length of the ride, or they will be ignored.

- On-street routes. Children riding on the sidewalk have an increased risk of collision with an automobile 2.5 times over riding on the street. A "bike path" that parallels a road is the same as a sidewalk. Riding a bicycle on sidewalks is prohibited in most jurisdictions in California, at least in business districts.

Use off-street routes only when they have no intersections with streets or driveways, or when they provide a substantial short cut. The faster the cyclists, the more important it is to avoid sidewalks.

Bicyclists should ride on the right side of the street with traffic for maximum safety (wrong way sidewalk riding has the highest risk). When the road is so narrow and so busy that young cyclists cannot ride on it safely, they should walk their bikes on the sidewalk. Generally, this is only feasible to require near intersections with crossing guards.

Where uphill slopes are so steep that the cyclists cannot maintain a straight line (about percent slope equal to age up to 12 years old), students should get off and walk on their bikes on the sidewalk. Similarly steep downgrades require well-maintained brakes and training in braking on hills. Students without that training should walk their bikes down the hills.

- Adequate width of curb lane and good maintenance of road edge. For safe sharing of the curb lane by motorists and cyclists, it should be at least 14 feet wide, with no on-street parking—wider is better, particularly for younger cyclists who cannot hold as straight a line. Broken pavement and accumulated debris on the side of the road can narrow the effective width substantially. If there is a bike lane, its width can be added to the rightmost travel lane to determine if width is adequate. On very quiet residential roads with low traffic speeds and good sight lines, even young children

can safely take a lane, and wide curb lanes are not needed.

Also watch out for drain grates, potholes, obstructed visibility, dogs off-leash, and other obvious hazards. It is best to scout out the routes by bicycle and consult with bicyclists who regularly cycle in the area.

- Right turns, not left turns. It is much easier for a cyclist (particularly a beginning cyclist) to turn right than to turn left. This means that the best route away from school may differ from the best route to school.

There are two ways to do left-turns safely: merging into the left-turn lane or crossing, stopping, turning the bike in place, and crossing again. The merge-left technique can be learned by students as young as 9-10 years old (later for multi-lane streets), but younger students should cross to the far right corner and then cross over to the left.

When left-turns are necessary, it is best if they can be done from low-traffic streets onto low-traffic streets, with all-way stops or traffic signals. T-intersections make left turns even easier, since there are fewer motor vehicle movements to watch out for.

- No right-turn only lanes where cyclists go straight. Right-turn-only lanes require cyclists to merge across a lane of traffic to continue straight. This skill can be learned by middle-school students, but only with proper bicycle instruction.

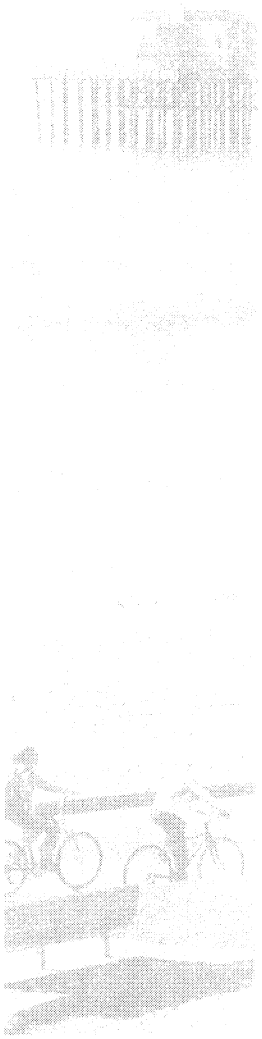
Where right-turn-only lanes are unavoidable, younger cyclists should probably be directed to walk their bikes on the sidewalk.

- Few stop signs. Stopping requires significant extra effort to regain loss momentum, tempting students to run stop signs illegally. It is safer for them to ride on a slightly busier street with fewer stops and the protection of having the right of way, than to risk running stop signs.

- Only traffic signals that sense bicyclists and give sufficient green time. For a bicyclists to use intersections with traffic signals safely, the traffic signals should detect the bike and make sure there is enough green time for the cyclist to clear the intersection. Traffic signals that do no meet this standard should have their sensors adjusted and be re-timed. Younger children may need to dismount and become pedestrians, using the pedestrian push-button and walking their bikes in the crosswalk.

- Few curb cuts. The turning traffic at commercial driveways is a serious hazard to bicyclists (even more so if they are on the sidewalk).

- Low traffic volume and low speeds. Although this criterion is often the first one people think of, it is actually the least important because most accidents involve turning traffic, not passing traffic. A street with few intersections or curb cuts is safer, even if motor vehicle volume and speed is higher.



Appendix D: California Bicycle Laws and Safety

The following are important excerpts from the California Vehicle Code (VC) relating to the operation and equipping of bicycles.

VC 231 - Bicycle Defined

Defines bicycle as a device upon which any person may ride, propelled exclusively by human power through a belt, chain, or gears and having one or more wheels. Specifically provides that persons riding bicycles are subject to Vehicle Code provisions specified in Sections 21200 and 21200.5 (see below).

VC 21200 - Bicycle Use

Every person riding a bicycle upon a street or highway has all the rights and is subject to all the duties applicable to the driver of a vehicle, including the provisions of law dealing with driving under the influence of alcoholic beverages or drugs, except those provisions that by their very nature can have no application.

Bicycling Under Influence of Alcohol or Drugs. VC 21200.5
Provides that it is unlawful to ride a bicycle upon a street or highway while under the influence of an alcoholic beverage or drug or the combination of alcohol and a drug, punishable by a fine of up to $250. A person arrested may request a chemical test. If the person is under 21 but over 13 years of age, his or her driving privilege will be suspended for one year or delayed for one year once the person is eligible to drive.

VC 21201 - Equipment Requirements

a) No person shall operate a bicycle on a roadway unless it is equipped with a brake that will enable the operator to make one braked wheel skid on dry, level, clean pavement.

b) No person shall operate on the highway any bicycle equipped with handlebars so raised that the operator must elevate their hands above the level of their shoulders in order to grasp the normal steering grip area.

c) No person shall operate upon any highway a bicycle that is of such a size as to prevent the operator from safely stopping the bicycle, supporting it in an upright position with at least one foot on the ground, and restarting it in a safe manner.

d) Every bicycle operated upon any highway during darkness shall be equipped with the following:

1. A lamp emitting a white light that illuminates the highway and is visible from a distance of 300 feet to the front and the sides of the bicycle.

2. A red reflector mounted on the rear of the bicycle and visible from 500 feet to the rear of the bicycle.

3. A white or yellow reflector mounted on each pedal visible 200 feet to the front and rear of the bicycle and a white or red reflector on each side to the rear of the center of the bicycle, except bicycles which are equipped with reflectorized tires on the front and the rear need not be equipped with side reflectors. All reflectorized tires must meet DMV requirements.

e) A lamp or lamp combination, emitting a white light, attached to the operator and visible from a distance of 300 feet in front and from the sides of the bicycle, may be used in place of a lamp attached to the bike.

VC 21202 - Duty of Bicycle Operator: Operation On Roadway
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 such 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 motor 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. 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.

b) Any person operating a bicycle on a one-way street or highway with two or more marked traffic lanes, may ride as near the left-hand curb or edge of such roadway as practicable.

VC 21203 - Hitching Rides
No person riding upon any motorcycle, motorized bicycle, bicycle, coaster, roller skates, sled, or toy vehicle shall attach the same or themselves to any streetcar or vehicle on the roadway.

VC 21204 - Riding On Bicycle
a) No person operating a bicycle on a highway shall ride other than on a permanent and regular attached seat.

b) No person operating a bicycle on a highway shall allow anyone to ride as a passenger other than on a separate attached seat. If the passenger is four years old or younger or weighs 40 pounds or less, the seat shall adequately retain the passenger in place and protect him/her from the bicycle's moving parts.

VC 21205 - Carrying Articles
No person operating a bicycle shall carry any package, bundle, or article which prevents the operator from keeping at least one hand upon the handlebars.

VC 21208 - Permitted Movements from Bicycle Lanes
a) Whenever a bicycle lane has been established on a roadway, any person operating a bicycle upon the roadway at a speed less than the normal speed of traffic moving in the same direction shall ride in the bicycle lane, except under the following situations.

1. When overtaking or passing another bicycle, vehicle, or pedestrian within the lane or about to enter the lane if such overtaking and passing cannot be done safely within the lane.

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

3. When necessary to leave the lane to avoid debris or other hazardous conditions.

b) No operator of a bicycle shall leave a bicycle lane until it can be done safely and then only after giving an appropriate hand signal in the event that any vehicle might be affected by the movement.

VC 21210 - Parking
No person shall leave a bicycle lying on its side on any sidewalk, or shall park a bicycle on a sidewalk in any other position, so that there is not an adequate path for pedestrian traffic. Local authorities may prohibit bicycle parking in designated areas of the public highway,

provided appropriate signs are erected.

VC 21211 - Obstruction of Bikeways
No person shall place or park a bicycle or vehicle so as to impede or block the normal and reasonable movement of any bicyclist on a bikeway or bicycle path or trail unless the placement or parking is necessary for safe operation or otherwise in compliance with the law.

VC 21212 - Youth Helmets
Prohibits persons under 18 from riding or being a passenger on a bicycle without wearing helmets meeting specified standards (ANSI or SNELL). Violations are punishable by a fine of not more than $25.

VC 21650.1 - Bicycles on Roadways
A bicycle operated on a roadway or highway shoulder shall be operated in the same direction as vehicles are required to drive upon the roadway.

VC 21960 - Bicycling on Freeways
a) The Department of Transportation and local authorities may prohibit or restrict the use of freeways or any portion thereof by bicycles.

b) Such prohibitory regulations shall be effective when appropriate signs giving notice thereof are erected upon the freeway and the approaches thereto.

VC 22111 - Hand Signals
All required signals given by hand and arm shall be given in the following manner:

1. Left turn-hand and arm extended horizontally beyond the side of the bicycle.

2. Right turn- left hand and arm extended upward beyond the side of the bicycle or right hand and arm extended horizontally to the right side of the bicycle.

3. Stop or sudden decrease of speed signal- left hand and arm extended downward beyond the side of the bicycle.

VC 23330 - Toll Crossing
Except where a special permit has been obtained from the Department of Transportation, bicycles shall not be permitted on any vehicular crossing, unless the Department by signs indicates that bicycles are permitted upon all or any portion of the vehicular crossing.

VC 27400 - Headsets and Earplugs
No person operating any vehicle, including a bicycle shall wear any headset covering, or any earplugs in, both ears. There are exceptions for persons operating authorized emergency vehicles, special construction or maintenance equipment and refuse collection equipment, and for any person wearing personal hearing protectors designed to attenuate injurious noise levels and which do not inhibit the wearers' ability to hear a siren or horn from an emergency vehicle or horn form another motor vehicle, and for any person using a prosthetic device which aids the hard of hearing.

VC 39002 - License Requirement
a) A city or county may adopt a bicycle licensing ordinance or resolution providing that no resident shall operate any bicycle on any street, road, highway, or other public property within the city of county, unless such bicycle is licensed in accordance with this division.

b) Any bicycle not licensed under this division may be additionally regulated or licensed pursuant to local ordinance or may be licensed upon request of the owner.

c) It is illegal for any person to tamper with, destroy, mutilate or alter any license indicia

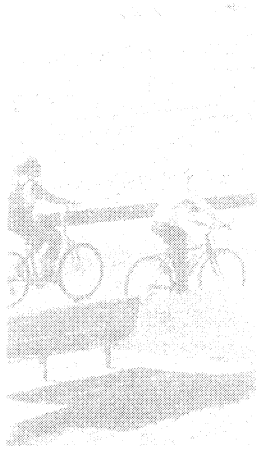
(marking) or registration form or to remove, alter, or mutilate the serial number, or the identifying marks of a licensing agency's identifying symbol on any bicycle frame licensed under the provision of this division.

VC 23111 - 23112
Throwing Substances On Highways Or Adjoining Areas.
No person in any vehicle shall throw or discharge from or upon any road, highway or adjoining area, pubic or private, any lighted or non-lighted cigarette, cigar, match or any flaming or glowing substance.

No person shall throw or deposit upon a highway any bottle, can, glass, wire, nails, paper or any substance likely to injure or cause damage to traffic using the highway.

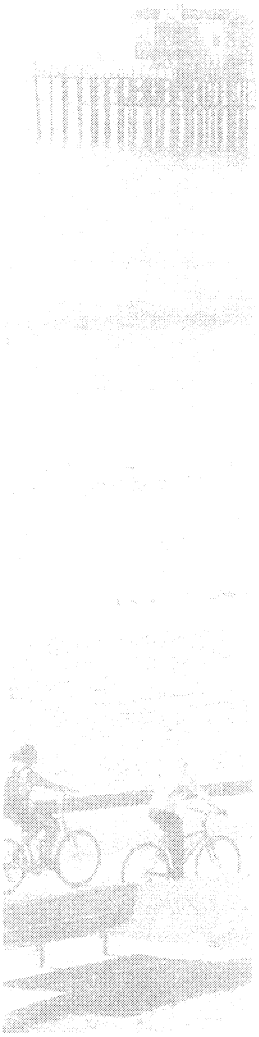
Note: Some of the sections of the laws listed above have been reworded slightly and/or abbreviated. For exact language, refer to the referenced sections in the California Vehicle Code.

In addition to these state laws, many communities have local ordinances. Check with local police departments regarding bicycle registration, licensing, and regulations (sidewalk riding, etc.).



Appendix E: Priority Scoring Sheets

The following tables were used to prioritize the projects in Chapter 5. They are separated by Planned Projects from the 1995 General Plan and the Recommended Projects from this current Bicycle Master Plan. Please refer to Chapter 5 for the prioritzed criteria.



Planned Class 1 Bike Paths

Segment Numbers	Length (ft)	Length (Miles)	Description	Notes	Destinations	Adequate access to activity centers and transit sites	Gap closures and route connectivity	Continuous Right-of-way	Roadways to accommodate bikeways	Regional Significance	Aesthetic attributes	High/Med/Low Volume of existing or potential bicycle traffic	Provides access to major bicycle traffic generators	Remedies or improves specific obstacles	Improves locations where bicycle crashes have occurred	Improves routes with high vehicular traffic volumes	Route or project has full or partial funding, or is likely to be funded	Route or project is contained in a specific plan	Total Score
1	13,966	2.6	Coastal Rail Trail	Portions have been completed between Vista Way and Morse Street. Not enough room along the track north of the transit center to complete the trail system.	San Luis Rey River Trail, City of Carlsbad, Commercial, Residential	3	3	3	1	3	3	3	3	3	3	3	3	3	37
2	37,850	7.2	Oceanside-Escondido Inland Rail Trail	The trail terminates at College Boulevard from Vista and users have to use Oceanside Boulevard to access the beach or downtown Oceanside. Wetland and easement space issues along the rail line still need to be resolved.	Beaches, City of Vista, Commercial, Residential	3	3	3	1	3	2	3	3	3	3	3	3	3	36
3	5,828	1.1	San Luis Rey River Trail Extension	Extension from College Boulevard to North Santa Fe Road. A half-mile section has already been constructed from College Boulevard along Andrew Jackson Street and Polk Street	San Luis Rey River Trail, Guajome Park, Residential	1	3	3	1	3	3	3	3	3	2	3	2	3	33
4	3,332	0.63	Hi Hope Ranch Bike and Equestrian Trail	Proposed Melrose Drive connection, planned San Luir River Rey connection	Currently conditioned in the development plans	1	2	1	1	2	3	2	2	2	1	2	2	3	24
Totals	**60,976**	**11.5**																	

Planned Class 2 Bike Lanes

Segment Numbers	Length (ft)	Length (Miles)	Description	Notes	Destinations	Adequate access to activity centers and transit sites	Gap closures and route connectivity	Continuous Right-of-way	Roadways to accommodate bikeways	Regional Significance	Aesthetic attributes	High/Med/Low Volume of existing or potential bicycle traffic	Provides access to major bicycle traffic generators	Remedies or improves specific obstacles	Improves locations where bicycle crashes have occurred	Improves routes with high vehicular traffic volumes	Route or project has full or partial funding, or is likely to be funded	Route or project is contained in a specific plan	Total Score
1	3,248	0.6	Foussat Road between Benet Road and Mission Avenue	To complete the Class 2 connection between Benet Road and Mission Avenue	San Luis Rey River Trail, SR-76, Pacific View Charter School, Residential	2	3	2	2	2	1	2	2	2	1	2	2	3	26
2	9,191	1.7	El Camino Real between Douglas Blvd and Mesa Drive	Bike lanes exist on the northbound lanes between Mesa Drive and Mission Avenue. Southbound bike lanes need to be installed. Bike lanes programmed to continue to Douglas Boulevard from Mission Avenue	Heritage Park, Commercial, Residential	3	3	3	1	3	2	3	2	3	3	3	2	3	34
3	2,479	0.5	Los Arbolitos Boulevard between Pala Road and Fireside Street	Complete connection between Pala Road and Fireside Street	Residential	1	3	2	2	1	1	2	2	2	1	1	2	3	23
4	17,876	3.4	North River road between Stallion Drive and east City limit	Currently an existing Class 3 bike route with high speed traffic	Melba Bishop Recreation Center, Bonsall, SR-76, Agriculture	2	3	3	1	3	3	3	2	3	1	3	2	3	32
5	3,939	0.7	Mission Avenue between Rancho Del Oro Drive and Old Grove Road	Currently an existing Class 3 bike route	Heritage Park, Old Mission Montessori, Commercial, Residential	2	2	2	3	2	1	2	2	1	1	2	2	3	25
6	2,115	0.4	Emerald Drive between Lake Boulevard and City limit	Complete Oceanside's portion of Emerald Drive of Class 2 bike lanes with the programmed bike lanes of the City of Vista	City of Vista, Residential	1	1	2	3	1	1	2	2	1	1	1	2	3	21
7	1,294	0.2	Cannon Road between Mystra Drive and City limit	Complete the connection to the City limit	City of Carlsbad, Residential	1	2	3	3	2	2	3	2	1	1	2	2	3	27
8	4,878	0.9	Pala Road between Los Arbolitos and Foussat Road	Completes the connection along the south side of the San Luis Rey River	Residential	2	3	2	2	2	1	2	2	2	1	2	2	3	26
Totals	**48,719**	**9.2**																	

Planned Class 3 Bike Routes

Segment Numbers	Length (ft)	Length (Miles)	Description	Notes	Destinations	Adequate access to activity centers and transit sites	Gap closures and route connectivity	Continuous Right-of-way	Roadways to accommodate bikeways	Regional Significance	Aesthetic attributes	High/Med/Low Volume of existing or potential bicycle traffic	Provides access to major bicycle traffic generators	Remedies or improves specific obstacles	Improves locations where bicycle crashes have occurred	Improves routes with high vehicular traffic volumes	Route or project has full or partial funding, or is likely to be funded	Route or project is contained in a specific plan	**Total Score**
1	7,609	1.4	Brooks Street/Division Street/Grant Street/Wisonsin Avenue between Mission Bouelvard and Pacific Street	Utilizes residential streets and an I-5 crossing without on/off ramps to connect Mission Boulevard to the beach area	Brooks Street Swim Center, Park & Ride, Senior Citizens Center, St Mary Star of the Sea Elementary, Beaches, Coastal Rail Trail, Residential	3	3	2	3	3	2	3	3	3	3	2	3	3	36
2	7,095	1.3	Hunsaker Street and Cassidy Street between California Street and Broadway	Utilizes residential streets and an I-5 crossing with only a southbound on/off ramp to connect California Street to the Coastal Rail Trail	Coastal Rail Trail, I-5, Beaches, South Oceanside Elementary, Residential	3	3	2	3	3	2	3	3	3	3	2	3	3	36
3	16,566	3.1	Sleeping Indian Road between North River Road and City limit	Connects North River Road to northern City limits	Rural Residential, Fallbrook, Agriculture	1	2	3	3	2	3	1	1	2	1	1	2	3	25
4	1,968	0.4	Sky Haven Lane between Lake Boulevard and Azure Lado Drive	Connection from Lake Boulevard to Calaveras Lake trails	City of Carlsbad, Residential, Calaveras Lake	1	2	2	3	1	1	1	3	1	1	1	2	3	22
Totals	**59,099**	**11.2**																	

Recommended Class 1 Bike Paths

Segment Numbers	Length (ft)	Length (miles)	Class 1 Bike Paths	Destinations	Notes	Adequate access to activity centers and transit sites	Gap closures and route connectivity	Continuous Right-of-way	Roadways to accommodate bikeways	Regional Significance	Aesthetic attributes	High/Med/Low Volume of existing or potential bicycle traffic	Provides access to major bicycle traffic generators	Remedies or improves specific obstacles	Improves locations where bicycle crashes have occurred	Improves routes with high vehicular traffic volumes	Route or project has full or partial funding, or is likely to be funded	Route or project is contained in a specific plan	Total Score
1	17,495	3.31	Mission Avenue to Inland Rail Trail	Guajome Park, Inland Rail Trail, new Vista park	Coordinate alignment with City of Vista and San Diego County Guajome Park. Coordination with NCTD on connection with Inland Rail Trail.	3	3	2	1	3	3	3	3	3	1	2	1	3	31
2	2,797	0.53	Spur Avenue to Melrose Drive and North Santa Fe Avenue	Rural residential, Guajome Park	Possible connection with Melrose Drive extension project	1	2	2	1	2	1	2	2	3	1	2	2	3	24
3	3,619	0.69	Douglas Drive and Manteca Drive	Residential	Paving exists. Trailheads and signage needed to complete the bike path designation.	1	1	3	1	1	1	1	2	1	1	1	3	1	18
4	3,085	0.58	Between Harbor Drive and Capistrano Drive	Residential, Oceanside Harbor	To avoid the I-5 interchange at Camp Pendleton. Bike path users would travel underneath I-5 onto Capistrano Drive wich would take them to San Rafael Drive and onto the base	1	3	2	1	3	3	3	2	3	1	3	1	1	27
Totals	35,229	5.1																	

Recommended Class 2 Bike Lanes

Segment Numbers	Length (ft)	Length (miles)	Class 2 Bike Lanes	Destinations	Notes	Adequate access to activity centers and transit sites	Gap closures and route connectivity	Continuous Right-of-way	Roadways to accommodate bikeways	Regional Significance	Aesthetic attributes	High/Med/Low Volume of existing or potential bicycle traffic	Provides access to major bicycle traffic generators	Remedies or improves specific obstacles	Improves locations where bicycle crashes have occurred	Improves routes with high vehicular traffic volumes	Route or project has full or partial funding, or is likely to be funded	Route or project is contained in a specific plan	Total Score
1	1,856	0.35	Los Arbolitos between Fireside Street to El Camino Real	Residential		1	3	3	1	1	1	1	2	1	1	1	2	1	19
2	566	0.11	Rancho Del Oro between Sprinter tracks and Oceanside Boulevard	Sprinter Station	To fill in the gap of missing bike lanes	3	3	3	3	2	1	3	3	3	1	3	3	3	34
3	712	0.13	Old Grove Road between Ocean Ranch Blvd and Mesa Dr	Industrial	Eastbound bike lane missing. Westbound bike lanes exist.	3	3	3	3	2	1	3	3	2	3	2	3	3	34
4	1,527	0.29	Melrose Drive between Old Ranch Road and Spur Avenue	Mission Meadows Elementary	Class 2 bike lanes exist on northbound Melrose but are missing on southbound Melrose from Seattle Slew to Spur Avenue.	2	3	3	3	1	1	1	2	1	1	1	2	3	24
5	1,730	0.33	Olive Drive between College Blvd and City of Vista	City of Vista, Olive Elementary		2	3	3	3	1	1	1	3	2	3	2	2	1	27
6	4,933	0.93	Avenida Del Oro between Old Grove Road and Oceanside Boulevard	Industrial		3	3	3	3	2	1	2	3	1	1	1	2	3	28
7	964	0.18	El Camino Real between Vista Way and City of Carlsbad	SR-78, City of Carlsbad	Overpass over SR-78 to complete bike lanes into/from the City of Carlsbad	3	3	1	1	3	1	3	3	3	3	3	2	1	30
8	2,981	0.56	Melrose Drive between North River Road and SR-76	Planned Hi Hope Ranch trail system	Can be condition into new development	2	3	3	1	3	2	2	3	3	1	2	1	3	29
9	1,368	0.26	North Old Grove Road between Nichols Elementary and Frazee Road	Nichols Elementary School, residential		2	2	3	3	1	2	3	3	1	3	2	2	1	28
10	1,525	0.29	Avenida De La Plata between Mesa Drive and Avenida Empressa	Empressa Elementary School, residential		2	3	3	3	1	1	2	2	1	1	2	2	1	24
11	520	0.10	Frazee Rd	Old Mission Montessori, O'Keefe Field, Tri_City Inline Park, North County Alano Club, San Luis Rey homes	Frazee Rd does not currently extend out to Academy Road	1	3	2	1	2	1	1	2	2	1	1	2	1	20
12	847	0.16	Douglas Blvd between Mission Avenue and SR-76	Commercial, Public Storage	Connects the existing Class 2 bike lanes on Mission Avenue and SR-76	3	3	2	3	2	1	3	3	3	3	3	2	1	32
13	6,913	1.31	Avenida De La Plata between Corporate Centre Drive and College Boulevard	Industrial, Commercial		3	3	3	3	2	1	2	3	1	1	1	2	3	28
Totals	26,442	5.0																	

Recommended Class 3 Bike Routes

Segment Numbers	Length (ft)	Length (miles)	Class 3 Bike Routes	Destinations	Notes	Adequate access to activity centers and transit sites	Gap closures and route connectivity	Continuous Right-of-way	Roadways to accommodate bikeways	Regional Significance	Aesthetic attributes	High/Med/Low Volume of existing or potential bicycle traffic	Provides access to major bicycle traffic generators	Remedies or improves specific obstacles	Improves locations where bicycle crashes have occurred	Improves routes with high vehicular traffic volumes	Route or project has full or partial funding, or is likely to be funded	Route or project is contained in a specific plan	Total Score
1	8,047	1.52	North Cleveland Street/Seagaze Street/South Tremont Street between Neptune Way and Oceanside Boulevard	Oceanside Transit Center, San Luis Rey River Trail, commercial, Regal Cinemas	Move stops signs at Missouri St and Wisconsin Ave onto the aforementioned streets to create a continuous route along Tremont Street	3	2	1	3	3	1	3	3	3	3	2	3	1	31
2	2,190	0.41	South Ditmar Street between Wisconsin Avenue and Oceanside Boulevard	Ditmar Elementary,Mary Star of the Sea Elementary, residential		3	3	1	3	1	1	2	2	2	1	1	2	1	23
3	4,454	0.84	Horne Street between Surfrider Way and Grant Street	Oceanside High School, residential		3	2	1	3	1	1	2	3	2	3	2	2	1	26
4	5,943	1.13	San Diego Street/Bush Street/Civic Center Drive/Archer St between North Cleveland Street and Canyon Drive	Oceanside Public Library, City Hall, commercial, residential		3	3	1	3	3	2	3	3	3	3	3	2	1	33
5	7,861	1.49	Loretta Street/Langford Street/Laurel Street/San Diego Street between SR-76 and Canyon Drive	SR-76, Joe Balderrama Recreation Center, Laurel Elementary, residential, commerical		3	2	1	3	2	1	2	3	2	1	1	2	1	24
6	6,491	1.23	Willow Avenue/Carey Road/Foster Street/Grace Street/Dixie Street/Barnes Street/Maxson St/Country Club Ln between Jefferson Middle School and Mission Avenue	Jefferson Middle School, Burgener Academy, Challenges Community Day, Oceanside Unified School District office, Senior Citizens Center, Victory Christian School, School of Business and Technology and a Park and Ride		3	1	1	3	2	1	3	3	2	3	1	2	1	26
7	4,840	0.92	Frontier Drive/Hacienda Drive/Flaminog Drive/Las Vegas Drive between Mission Avenue and Foussat Road	Park and Ride, Pacific View Charter, residential		3	2	1	3	1	1	2	2	2	1	1	2	1	22
8	3,308	0.63	Academy Road/Private Rd/Via Santa Maria along Mission Avenue	Old Mission Montessori, O'Keefe Field, Tri_City Inline Park, North County Alano Club, San Luis Rey homes	If Frazee Rd will connect in the future, this route will allow access to the school from adjacent neighborhoods. Via Santa Maria is primarily a narrow road to access the Montessori from Mission Avenue.	3	1	1	1	1	1	1	2	2	1	1	2	1	18
9	21,337	4.04	Moonstone Bay Drive/Marblehead Bay Drive/Calle Montecito/Claire Drive/Monica Circle/Macario Drive/Roja Drive/Cardiff Bay Drive/ Elaine Avenue/Redondo Drive/Calle De Palo/Festival Dr/Gold Drive between Douglas Drive and North River Road and Vandergrift Boulevard	Reynold Elementary, Pacifica Elementary, Kids of the Kingdon, Libby Elementary, Libby Lake Skate Park, residential	Bicycle access issues on Monica Cr towards Macario Dr. Bollards block the sides of the lane forcing bicycles to go over speed bumps going both uphill and downhill.	3	3	1	3	3	1	3	3	2	3	2	2	1	30
10	4,169	0.79	Gold Drive/Barry Street/Leon Street between Vandergrift Boulevard and North River Road	Melba Bishop Recreation Center, Del Rio Elementary, residential, commercial		3	2	2	3	1	1	2	3	2	2	1	2	1	25
11	3,936	0.75	Oleander Drive/Gardenia Street/Adams Street between College Boulevard and Frazee Road	Cesar Chavez Middle School, Mance Buchanon Park, San Luis Rey River Trail, residential		3	3	2	3	2	2	2	3	2	1	2	2	1	28
12	9,728	1.84	Jeffries Ranch Road/Wagon Wheel Drive/Spur Avenue/Buckboard Drive/Del Mar Road between SR-76 and Melrose Drive	Mission Meadows Elementary, residential		2	2	1	3	1	1	1	3	2	1	2	2	1	22
13	14,313	2.71	Silver Bluff Drive/Masters Drive/Corona Drive/Alamosa Park Drive/Rio Plata Drive/Robinwood Drive/Muirwood Drive/Summerhill Drive/Sagewood Drive between College Boulevard and Mesa Drive	Alamosa Park Elementary, Roosevelt Middle School, Alamosa Park, residential		3	2	1	3	2	1	2	3	2	1	1	2	1	24
14	7,009	1.33	Temple Heights Drive between Pine Ridge Road and North Avenue	Sprinter line, Temple Heights Elementary, residential		3	3	2	3	2	1	2	3	2	3	2	2	1	29
15	1,389	0.26	Avenida Empresa between College Boulevard and Avenida De La Plata	Empresa Elementary, residential		2	3	3	3	1	1	1	2	2	1	1	2	1	23
16	7,205	1.36	Thunder Road/Lewis Road/Cedar Road between College Boulevard and Vista Way	John Landes Recreation Center, Childrens Hospital, residential	Thunder Road is a heavily travelled road parallel to College Blvd access primarily residential and some commerical offices. Lots of stop signs along this stretch. Some stop signs can be placed on the incoming streets to allow bicycles a continuous route along Thunder Road.	3	2	2	3	2	1	2	3	2	3	3	2	1	29
17	12,301	2.33	Cameo Drive/Brandeis Drive/Kelton Drive/Marvin Street/Sherbourne Road/Thunder Road between Rancho Del Oro and College Boulevard	McAuliffe Elementary, Sherbourne Park	Brandeis Drive is a steep climb from Cameo Drive	2	2	2	3	2	1	2	3	2	1	1	2	1	24
18	4,049	0.77	Plaza Drive and Thunder Road between College Boulevard and Lake Boulevard	City of Vista, Tri-City Crossroads, College Plaza		3	3	3	3	2	1	2	2	3	3	3	2	1	31
19	2,957	0.56	Shadowridge Drive between Cannon Road and City of Vista	City of Vista, residential		1	3	2	3	2	1	2	3	1	1	1	2	1	23
20	4,304	0.82	Via Puerta Del Sol between North River Road and Bonsall	Rural residential		1	2	3	3	2	3	1	1	1	1	1	2	1	22

Recommended Class 3 Bike Routes (continued)

Segment Numbers	Length (ft)	Length (miles)	Class 3 Bike Routes	Destinations	Notes	Adequate access to activity centers and transit sites	Gap closures and route connectivity	Continuous Right-of-way	Roadways to accommodate bikeways	Regional Significance	Aesthetic attributes	Volume of existing or potential bicycle traffic	Provides access to major bicycle traffic generators	Remedies or improves specific obstacles	Improves locations where bicycle crashes have occurred	Improves routes with high vehicular traffic volumes	Route or project has full or partial funding, or is likely to be funded	Route or project is contained in a specific plan	Total Score
21	2,012	0.38	Stewart St between California Street and Cassidy Street	Residential		1	2	2	3	1	1	2	2	1	1	2	2	1	21
22	4,800	0.91	Maxson Street/Grace Street and Greenbrier Drive between Country Club Lane and Oceanside Boulevard	Senior Citizens Center, Victory Christian School and a Park and Ride		3	2	1	3	2	1	2	3	1	1	1	2	1	23
23	4,191	0.79	Mission Gate Drive between Via Rancho Road and Mission Avenue	Residential		1	3	2	3	2	2	2	3	1	1	2	2	1	25
24	11,883	2.25	Darwin Drive and Peacock Boulevard between Oceanside Boulevard and North Santa Fe Avenue. Sagewood Drive	Residential		1	2	2	3	2	1	2	3	1	1	2	2	1	23
25	5,753	1.09	Barnard Drive around Mira Costa College	Mira Costa College		3	3	3	3	1	1	3	3	1	1	2	2	1	27
26	2,892	0.55	Waring Road between College Boulevard and Thunder Road	Residential		3	3	3	3	1	1	2	3	3	3	2	2	1	30
27	1,493	0.28	Mira Monte Drive between Lake Boulevard and city limit	Residential		1	2	2	3	1	1	2	2	1	1	1	2	1	20
28	2,776	0.53	Fireside Street between Los Arbolitos Blvd and Mission Avenue	Residential	Planned Class 2 but roadway configurations and on-street parking won't allow bike lanes	2	3	2	3	1	2	2	2	3	3	2	2	1	28
29	2,580	0.49	Surfrider Way between Pacific Street and Horne Street	Residential, commercial, motels		2	3	3	3	3	3	3	3	1	1	2	2	1	30
30	1,012	0.19	Oceanside Boulevard between Coast Highway and Pacific Street	PCH 101, Alan's Family Bike Shop	Contiues the Class 2 bike lanes to the recommended bike route on Tremont Street	3	3	3	3	1	2	2	2	3	3	3	2	1	31
31	4,076	0.77	Cranberry Street and Guajome Lake Rd	Guajome Park		2	2	2	3	1	1	2	3	1	1	1	2	1	22
32	3,571	0.68	Mission Avenue between I-5 and Pacific Street	Beaches, commercial	Completes a bike facility from I-5 to the beach. Sharrows recommended due to high traffic volumes and on-street parking	2	3	3	3	3	3	3	3	3	1	3	2	1	33
Totals	182,870	34.6																	

NOTICE OF EXEMPTION
City of Oceanside, California

Post Date: 12/17/08
Removal: 1/19/09
(30 days)

1. **APPLICANT:** City of Oceanside
2. **ADDRESS:** Various locations Citywide
3. **PHONE NUMBER:** (760) 435-5088
4. **LEAD AGENCY:** City of Oceanside
5. **PROJECT MGR.:** Steve Tisdale
6. **PROJECT TITLE:** Bicycle Master Plan Update
7. **DESCRIPTION:** The proposed project is an update to the City of Oceanside Bicycle Master Plan. No individual bike path or trail projects are proposed to be constructed concurrent with approval of this document. Subsequent projects will require appropriate review under the California Environmental Quality Act (CEQA).

ADMINISTRATIVE DETERMINATION: Planning Division staff has completed a preliminary review of this project in accordance with the City of Oceanside's Environmental Review Guidelines and the California Environmental Quality Act (CEQA), 1970. Based on that review, the Environmental Coordinator finds that the proposed project constitutes an update to the Bicycle Master Plan. Therefore, the Environmental Coordinator has determined that further environmental evaluation is not required at this time because:

[X] "The activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA" (Section 15061(b)(3)); or,

[ ] The project is statutorily exempt, Section_____, <name> (Sections 15260-15277); or,

[ ] The project is categorically exempt, Class 1, Existing facilities, Section 15301(a).

[ ] The project does not constitute a "project" as defined by CEQA (Section 15378).

Jerry Hittleman, City Planner

Date: December 9, 2008

cc: [x] Project file [x] Counter file [x] Library Posting: [X] County Clerk $50.00 Admin. Fee