City of Encinitas

Bikeway Master Plan

Prepared for:

City of Encinitas
Planning and Building Department

Prepared by:

KTU+A
Landscape Architecture + Planning

January 2005

Acknowledgements

Encinitas City Council

Dan Dalager, Mayor
Christy Guerin, Deputy Mayor
Jim Bond
Maggie Houlihan
Jerome Stocks

City of Encinitas Planning Commission

Gene Chapo, Chair
Lester H. Bagg, Vice Chair
Doug Avis
Tom McCabe
Bill Snow

City of Encinitas Traffic Commission

Hersey Mallory, Chair
Christopher Hall, Vice Chair
Patricia Klaus
Arnold Lewin
Thomas Frank

City of Encinitas Staff

Patrick Murphy, Planning and Building Director
David de Cordova, Principal Planner
J. Alfred Dichoso, Associate Planner and Project Manager
Rob Blough, Traffic Engineer

Consultant: KTU+A Landscape Architecture + Planning

John Holloway, Project Manager
Joseph Punsalan, GIS Analyst

Table of Contents

Chapter 4: Multi-Modal Analysis

Chapter 5: Safety Analysis

Chapter 6: Opportunities and Constraints

Chapter 7: Community Input

Chapter 8: Recommendations

Chapter 9: CIPs and Bikeway Funding

Chapter 10: Design Guidelines

Appendices

Figures

Tables

Executive Summary

Project Scope

This study is a comprehensive update of the 1990 "Master Bikeway Plan and Engineering Feasibility Study for the City of Encinitas." The city's population growth and physical expansion necessitated an update to better address not only local bicycle travel needs, but also to better serve regional long-distance travel need. 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 metropolitan regional bikeway system. The project's scope included documenting and evaluating Encinitas' 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.

This plan incorporated the latest in geographic information systems (GIS) technology to support its planning recommendations. GIS data were used to characterize facility siting factors such as housing, population and employment densities. They were also used to determine route suitability for several proposed segments using a bicycle suitability model modified for Southern California conditions.

Proposed bikeway connections to an extensive planned regional trail system reflected the broad shift in bicycle type since the previous master plan from "road bikes" to "mountain bikes" with off-road capability.

The planners' acquired "on the ground" familiarity of the city and the subsequent thorough analysis resulted in supportable recommendations portrayed in clear text and a graphic format. Each copy of the document included a "pocket map" of the existing and proposed bikeway facilities intended to serve as a stand-alone executive summary that graphically describes factors such as the bikeway types, projected costs and the expected land use changes that initially drove this study.

Compliance with State Law

Pursuant to California law, this plan is to complement the City of Encinitas' General Plan Circulation Element and is already being 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 2004/2005 fiscal year began on July 1, 2004. Cities applying for 2004/2005 BTA funds must have a bikeway master plan adopted July 1, 2000 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, a mail-in survey questionnaire and geographic information systems (GIS) analysis of the field work data. Encinitas' existing bikeway system was analyzed for a number of factors using both traditional field survey and GIS techniques. (See Chapter 1: Introduction.)

Literature Review

Applicable sections of documents related to Encinitas' bikeway system are excerpted in Chapter 2: Background Information. These include the current City of Encinitas General Plan, the 1990 Master Bikeway Plan and Engineering Feasibility Study for the City of Encinitas, as well as neighboring community, regional and state plans and guidelines. (See Chapter 2: Background Information.)

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, 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 Meetings and Survey Questionnaire

Two community meetings were held at City Hall in March and June, 2004 to gather input from local cyclists to take advantage of their familiarity with the existing bikeway system.

A questionnaire was developed to reveal as much as possible about current user numbers, user types, preferred facility types and times of use. The questionnaire was distributed at community meetings. Copies were also placed at area bicycle shops and City facilities such as libraries and community centers.

An entire chapter of this document is devoted to the participating citizens' indispensable contributions, which helped form the foundations for the overall project. (See Chapter 7: Community Input.)

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. Training, 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 9: CIPs and Bikeway Funding.)

Specifically, proposed bikeway facilities will 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. The input of local cyclists was also sought in the planning process, making full use of valuable local knowledge.

Project Goals

The following project goals were developed in close cooperation with City staff. These goals are the fundamental criteria for the City of Encinitas' 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 at right and "Bikeway Facility Types" on following page, and Chapter 1: Introduction.)

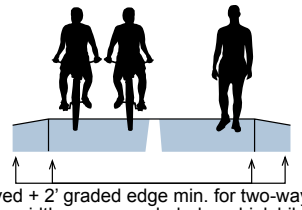
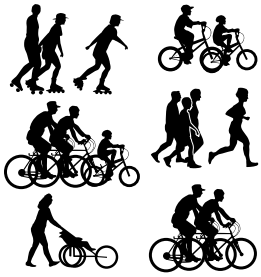
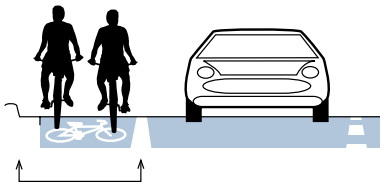
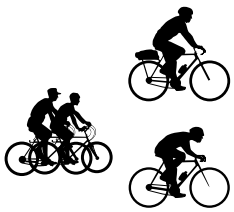
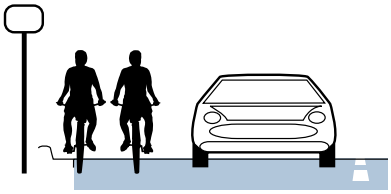
Trip Origin and Destination Analysis
Analysis of specific types of bicycle trip origin and destination points are required by Caltrans for its approval of bikeway master plans. The standard Caltrans list includes residential neighborhoods, schools, shopping centers, public buildings and major employment 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, some unique to Encinitas such as beach

"Class 1 path" along Coast Highway 101

Class 2 lane on K Street


Class 3 route on Coast Highway 101

Bikeway Facility Types

	Typical Sections	Locational Criteria	Typical Users
Class 1 (Bike Path or Bike Trail)	 10' paved + 2' graded edge min. for two-way travel (Greater width recommended where high bike volumes or high levels of mixed use occur - 8' paved min. may be acceptable under limited circumstances) See Section 10-4	Right-of-way separated from motor vehicular traffic. Used where adjacent roadway speeds and ADTs are too high for safe joint use, for connections through open space areas and parks, or where no other facility type is feasible.	 Kids, Family Recreational, Adult Exercise, Skaters, Joggers, Recreational Walkers, Exercise Walkers
Class 2 (Bike Lane or Bikeway)	 5' min. total width where curb occurs, 6' adjacent to parking (Wider bike lane recommended where bike volumes are high - up to 8' maximum) See Section 10-6	Within vehicular right-of-way, but delineated by warning symbols and striping. 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.	 Adult Recreational, Commuters and Serious Cyclists
Class 3 (Bike Route)	 (Wider than standard outside lane recommended) See Section 10-7	Within vehicular right-of-way, but delineated by directional signage only. Used where roadway speeds and ADTs are fairly low, and where route directness and number of users is not likely to be significant. Primarily for route directions on suggested roadways.	 Commuters and Serious Cyclists

access points. Other trip origin and destination points included the city hall, school district offices, hospitals, park and ride lots, sheriff's stations, train stations, transportation centers, beach access points, parks, community or visitors center and libraries. (See Chapter 3: Trip Origin and Destination Points.)

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 4: Multi-Modal Analysis.)

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 literature 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 5: Safety Analysis.)

Crash Data Analysis

The consultant analyzed ten years of data provided by the City, from 1993 to 2003, for reported crashes involving bicycles. These data points were digitized onto a City street map and analyzed for trends in crash types and clusters. The reported crash locations were also compared to posted speed limits and traffic volume to determine if there were any correlations. Overall, the trend had been relatively flat, but there has been a definite tendency to fewer crashes since 1999.

Opportunities and Constraints

Most of the bikeways proposed in this bikeway master plan update have been proposed in other documents, such as in the existing 1990 Bikeway Master Plan and in specific plans. 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 Encinitas are in place. (See Chapter 6: Opportunities and Constraints.)

Coastal Rail Trail

Since it is a portion of a long-range, truly regional bikeway route connecting all the coastal cities of San Diego County from Oceanside to San Diego, it should be attractive to many commuting cyclists as well.

City of Encinitas Recreational Trails Master Plan

Even though bikeway master plans specifically address bicycle facilities on paved roadways, a community's trails are relevant, even if they are unpaved and are not intended to meet Caltrans bikeways standards. This is especially true wherever connections can be made that enhance intra-community connectivity by linking the two systems because the majority of bicycles being purchased today have wide tires and can be safely ridden on firm surfaces such as compacted decomposed granite (DG). See Section 2.5.1.

Compact City Form

Downtown Encinitas contains many of the bicycle trip generators and destination points that will be accessed by the proposed bikeway system and more are located along the coastal strip north and south of downtown. The downtown area's urban form is a small block grid pattern whose characteristics benefit cycling by dispersing motor vehicle traffic loads across a compact urban area. This city core also lies within a coastal plain with minimal grades. Most of the bikeway facilities proposed in this study are not encumbered by steep grades. Especially along the coast, grades are relatively flat.

Current Constraints to Cycling

Steep or Long Grades

Some portions of Encinitas where bikeway facilities already exist or are proposed have significant grades, either particularly long or steep. Hills are a reality of the southern California region and most commuting and "serious" cyclists are probably not deterred by hilly terrain. However, recreational or less experienced cyclists may opt to avoid areas of steep or long grades. (See Figure 6-1: Grades.)

Lack of Connectivity

Most of Encinitas is served by a logical system of arterial roadways befitting the local topography, both in the hilly eastern portion and the flatter western portion of the City. As new development occurs, especially in the eastern area, this arterial pattern is expected to continue. City policy is to include Class 2 bikeway facilities on all major roadways.

The interstate highway and rail line present significant problems in terms of connectivity. The distances between crossing points forces cyclists to plan east/west trips based on their locations. Even then, where underpasses and overpasses do provide access, the passageway is often narrow and cyclists are confronted with motor vehicles making their way to and from high speed vehicular off and on-ramps, often multi-lane. Like other issues, this was originally brought to light in questionnaire respondent comments and reviewed during field work.

High Motor Vehicle Speeds

Many of Encinitas' existing Class 2 bikeway facilities are on arterial roadways with relatively high posted motor vehicle speeds. Experienced cyclists are generally not concerned with adjacent motor vehicle speeds, especially when they can rely on the relative safety of their own Class 2 lane or a wide curb lane. However, less experienced cyclists are more likely to find such conditions uncomfortable and may be less likely to use these high speed roadways.

Lack of Available Rights-of-Way

Most roadways in Encinitas on which Class 2 bicycle facilities are proposed have rights-of-way averaging 60 feet. However, implementation of some proposed routes may be constrained by the lack of available physical space because the roadways on which they are proposed have very limited rights-of-way, as little as 40 feet. Providing bikeways may be difficult or even impossible without land acquisition.

Loss or Degradation of Bikeway Facilities

Class 2 bikeways are inadvertently lost or degraded when lanes are re-striped and effectively lost when bikeways are not carefully resurfaced and re-striped following roadway and utility repairs. The result is rough, piecemeal or even, over time, nonexistent bike lanes.

Recommendations

The recommendations 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 Encinitas has a fairly comprehensive system of Class 2 bikeways along its major roadways in the eastern portion of the City. There is only one existing Class 3 route, Coast Highway 101 north of Encinitas Boulevard. The facilities shown in "Proposed Bikeway System" on page EX-9 represent all three types of proposed bikeways and are delineated by proposed CIP segment numbers. The following text sections describe these bikeway components in more detail.

Class 1 Facilities (CIP Segment 1 only)

CIP Segment 1 - Coastal Rail Trail (CIP Segment 1): Completion of the Class 1 portions of the Coastal Rail Trail along the entire length of the City of Encinitas between the Cities of Carlsbad and Solana Beach would be a boon to local and regional cyclists. The facility will be a paved, multi-use, regional route connecting the coastal cities of San Diego County within the rights-of-way of the existing rail line and within roadways where the rail line access does not exist, such as over lagoons.

Class 2 Facilities (CIP Segments 2-21)

CIP Segment 2 - Coast Highway 101 between K Street and Cardiff State Beach: This segment upgrades the southernmost section of Coast Highway 101, which is made up of an unorganized arrangement of official and "unofficial" bikeway facilities. This is the only bikeway connection between Encinitas and Solana Beach.

CIP Segment 3 - Coast Highway 101 between D Street and La Costa Avenue: This segment upgrades the northern section of Coast Highway 101 from a Class 3 route to a Class 2 lane. This is a very heavily used bicycling route, for commuting, recreation and training. This Class 2 installation is also called for in the North 101 Corridor Specific Plan.

CIP Segment 4 - Leucadia Boulevard between Coast Highway 101 and Urania Avenue: This segment upgrades a currently undesignated route to a Class 2 lane. This is a fairly heavily used route over Interstate 5 between eastern Encinitas and Carlsbad and coastal Encinitas. It is also intended to improve access to a proposed Urania Avenue Class 3 route to serve a "Safe Routes to School" function for Capri Elementary School.

CIP Segment 5 - Santa Fe Drive between El Camino Real and San Elijo Avenue: This segment is an upgrade of an east-west roadway connecting east central Encinitas under Interstate 5 with downtown coastal Encinitas. A high school lies near the center of this segment and it also serves a hospital and retail center just west of Interstate 5.

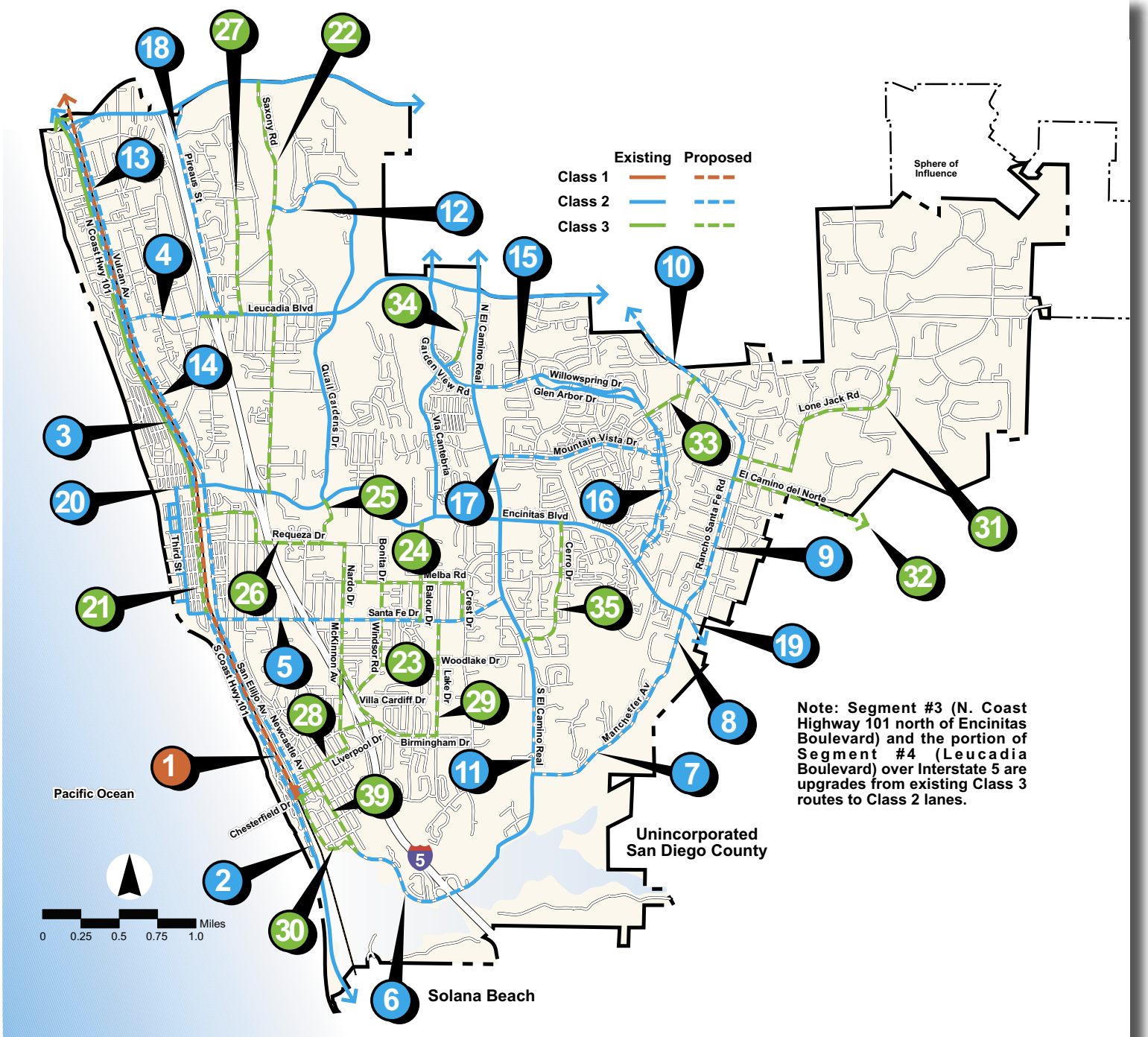
CIP Segment 6 - Manchester Avenue between San Elijo Avenue and Interstate 5: This is one of three segments of Manchester Avenue, but the only one west of Interstate 5. This is a fairly well used route connecting southeastern and coastal sections of Encinitas under Interstate 5. It would also provide a Class 2 access between the coastal areas and Mira Costa College, which lies on the only section of Manchester Avenue that currently has Class 2 facilities. This is a scenic route.

CIP Segment 7 - Manchester Avenue between El Camino Real and Trabert Ranch Road: This segment is the second of three on Manchester Avenue and a continuation of an existing Class 2 segment just east of Interstate 5. It will likely require right-of-way acquisition due to limited roadway width and road widening will require significant grading due to local topography. It is part of a popular and scenic cycling route.

CIP Segment 8 - Manchester Avenue between Trabert Ranch Road and Encinitas Boulevard: This segment is the third of three Class 2 segments proposed for Manchester Avenue. It connects to an existing Class 2 lane on Encinitas Boulevard and access to a retail center. It is part of a popular cycling route.

CIP Segment 9 - Rancho Santa Fe Road between Encinitas Boulevard and El Camino del Norte: This segment provides a connection between existing Class 2 lanes on Encinitas Boulevard and a short existing Class 2 segment on Rancho Santa Fe Road north of El Camino del Norte. It would be part of an overall route connecting Carlsbad to eastern Encinitas. It is a popular cycling route.

Proposed Bikeway System



CIP Segment 10 - Rancho Santa Fe Road between Calle Santa Catalina and City of Carlsbad boundary: This segment would complete a route connecting Carlsbad and eastern Encinitas with coastal Encinitas. The northern end of this segment comes very close to Leucadia Boulevard (Olivenhain Road in Carlsbad) and would provide another connection to coastal Encinitas from eastern Encinitas and Carlsbad.

CIP Segment 11 - El Camino Real between Manchester Avenue and Tennis Club Drive: This is the sole remaining segment of El Camino Real that does not have Class 2 lanes in place.

CIP Segment 12 - Quail Hollow Drive between Saxony Road and Swallowtail Road: This is a short continuation of Quail Gardens Drive that otherwise has Class 2 lanes in place as part of recent construction.

CIP Segment 13 - Vulcan Avenue/San Elijo Avenue between Santa Fe Drive and Leucadia Boulevard: Vulcan Avenue is a popular north-south route for cyclists who would prefer not ride on busier Coast Highway 101. This segment is the subject of an ongoing bicycle and pedestrian study and noted in the North 101 Corridor and Downtown Encinitas Specific Plans.

CIP Segment 14 - Vulcan Avenue Between Leucadia Boulevard and La Costa Avenue: This is the northern portion of a popular north-south route and included in a specific plan.

CIP Segment 15 - Gardenview Road between El Camino Real and Willowspring Drive/ Glen Arbor Drive: This segment would complete a connection between El Camino Real and the residential areas around Willowspring Drive and Glen Arbor Drive. The latter two streets are one-way couplets.

CIP Segment 16 - Willowspring Drive/Glen Arbor Drive between Encinitas Boulevard and Village Park Way: Class 2 lanes already exist on a significant portion of these two one-way couplet streets. This segment would complete this route and provide a connection between El Camino Real and Encinitas Boulevard through this large residential area.

CIP Segment 17 - Mountain Vista Drive between El Camino Real and Willowspring Drive: This segment would provide a connection between El Camino Real and the WIllowspring Drive/Arbor Drive couplet through a large residential area.

CIP Segment 18 - Piraeus Street between Leucadia Boulevard and La Costa Avenue: This segment would provide another north-south connection between Carlsbad and La Costa Avenue and Leucadia Boulevard. Currently, none exists east of Coast Highway 101.

CIP Segment 19 - Encinitas Boulevard/Rancho Santa Fe Road to eastern city boundary: Along with a small section (CIP Segment 20) at the far west end west of Coast Highway 101, this small segment of Rancho Santa Fe Road would complete the Class 2 lane begun on Encinitas Boulevard. This segment would provide a connection to County facilities east of the City of Encinitas.

CIP Segment 20 - Encinitas Boulevard between Interstate 5 and Third Street: This is a small section of Encinitas Boulevard/B Street west of Coast Highway 101 that would connect with the existing Class 2 lanes on Third Street. This would provide a connection to coastal and downtown Encinitas from east of Interstate 5.

CIP Segment 21 - Saxony Road between La Costa Avenue and Quail Hollow Drive: This section of Saxony Road would connect with the existing La Costa Avenue Class 2 lanes and the proposed Class 2 lanes on Quail Hollow Drive. This would provide a connection between Encinitas Boulevard and La Costa Avenue east of Interstate 5.

Class 3 Facilities (CIP Segments 22-39)

CIP Segment 22 - Coast Highway 101 between K Street and D Street: Coast Highway 101 has limited roadway width, high levels of motor vehicle traffic and angle parking. Class 2 bike lanes are available on nearby Third Street as an alternate parallel route to avoid the problems of riding on Highway 101.

CIP Segment 23 - Windsor Road/Villa Cardiff Drive/Woodlake Drive: Parts of these three streets are proposed as Class 3 routes primarily serving Ada Harris Elementary School as "Safe Routes to School" as well as park access.

CIP Segment 24 - Balour Drive/Bonita Drive/Crest Drive/Melba Road/Nardo Road: Portions of these five streets north of Santa Fe Drive are proposed as Class 3 routes primarily serving San Dieguito Academy, Ocean Knoll Elementary and Oakcrest Junior High Schools as "Safe Routes to School."

CIP Segment 25 - Westlake Street: This route is the southern continuation of the Quail Gardens Drive Class 2 lane across Encinitas Boulevard.

CIP Segment 26 - D Street/Stratford Drive/Requeza Street: This route connects central and downtown coastal Encinitas via a safe crossing of Interstate 5 using the Requeza Street bridge. This route is intended to take advantage of a freeway crossing that is not at an interchange and experiences low motor vehicle traffic volumes.

CIP Segment 27 - Urania Avenue: This is a Class 3 routes primarily serving Capri Elementary School as a safe route to school.

CIP Segment 28 - Chesterfield Drive/Newcastle Avenue/Liverpool Drive/Mackinnon Avenue/Nardo Road: These are an alignment of parts of four streets proposed as a Class 3 route connecting coastal Cardiff and central Encinitas east of Interstate 5, including connection to the future park at the Hall property.

CIP Segment 29 - Birmingham Drive and Lake Drive: These two streets together form a proposed Class 3 route serving Ada Harris Elementary School and Park, Cardiff Sports Park, and a park and ride lot. This route connects coastal Cardiff and central Encinitas east of Interstate 5.

CIP Segment 30 - San Elijo Avenue between Manchester Avenue and Chesterfield Drive: This Class 3 segment is a continuation of Segment 6 (Manchester Avenue) and completes a route connecting Carlsbad and eastern Encinitas with coastal Encinitas. This segment is proposed as a Class 3 primarily due to limited rights-of-way. This is a popular cycling route.

CIP Segment 31 - Lone Jack Road between Rancho Santa Fe Road and Fortuna Ranch Road: This segment would provide a connection between Rancho Santa Fe Road and central Olivenhain immediately to the east that is served by this route only.

CIP Segment 32 - El Camino del Norte between Rancho Santa Fe Road and County of San Diego boundary: This segment would provide a connection to County facilities east of the City of Encinitas. This is one of only two connecting routes with unincorporated County land east of Encinitas.

CIP Segment 33 - Village Park Way/Morning Sun Drive: This Class 3 route primarily serves Diegueno Junior High School, but also provides a neighborhood connection between Encinitas Boulevard and Rancho Santa Fe Road. This route is not contiguous.

CIP Segment 34 - Via Cantebria between Garden View Road and Town Center Drive: This route is a continuation of an existing Class 2 lane that currently ends just north of Garden View Road. It would connect this Class 2 lane with Leo Mullens Sports Park and a retail center.

CIP Segment 35 - Cerro Drive: This route would provide a safer alternative to going through the intersection of Encinitas Boulevard and El Camino Real.

CIP Segment 36 - Requeza Street/East F Street between Stratford Drive and Vulcan Avenue: This route would provide an direct alternate connection between central Encinitas and Vulcan Avenue.

CIP Segment 37 - Second Street between D and K Streets: This route would provide an alternative to riding on Coast Highway 101.

CIP Segment 38 - Saxony Road between Quail Hollow Drive and Encinitas Boulevard: This route would provide a north-south route between La Costa Avenue and Encinitas Boulevard east of Interstate 5.

CIP Segment 39 - Manchester Avenue between San Elijo Avenue and Liverpool Drive and Chesterfield Avenue between Manchester Avenue and Newcastle Avenue: Particularly for less experienced cyclists, this route would provide an alternative connection between Manchester and Chesterfield Avenues that avoids a narrow and fairly steep portion of San Elijo Avenue to the west that is part of Segment 30.

CIPs and Bikeway Funding

The following sections define the recommended bikeway system improvements as CIP projects and provide construction costs. See Figure 9-1: Proposed CIP Project Segments, for a graphic overview of the proposed bikeway segments. For general bikeway component construction costs, see Table 9-1: Typical Unit Construction Costs. For a brief description of each segment, including estimated costs and segment lengths, see Table 9-2a and 9-2b: Capital Improvement Projects. See Chapter 8 for more detailed text descriptions. The remaining sections of this chapter describe the funding sources available for bikeway projects, followed by a summary, Tables 9-3A and B: 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, completion of the Coastal Rail Trail was given first priority, followed by routes that would most benefit bicycle transportation.

Note that the segment numbering sequence lists the sole Class 1 facility (Coastal Rail Trail) first, followed by the proposed Class 2 facilities and the Class 3 facilities last. This represents the recommended prioritization within facility classes only, not an overall prioritization of bikeway facility segments. 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 2 and 3 facilities be regarded as parallel lists and be implemented as appropriate funds become available for each type of facility. (See Table 9-2a and 9-2b: Capital Improvement Projects, for more information.)

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 across flat terrain roadbed will require far less grubbing, grading and structural enhancements than a facility being constructed through an undeveloped area with hilly topography. The cost used in Table 9-2 was $326 per linear foot, or approximately $1,722,507 per mile, due to extensive construction, grading, bridges and environmental review. (Source: City of Encinitas.)

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. The cost used in Table 9-2 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 of $1,500 to $5,000 per mile. The cost used in Table 9-2 was $0.70 per linear foot, or approximately $3,500 per mile.

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 10 contains a comprehensive set of bikeway design guidelines.

The appendices contain the required Caltrans Bicycle Transportation Account (BTA) compliance data, applicable state and federal bikeway planning publications, guidelines for selecting safe routes to school, and the California Vehicle Code sections on roadway bicycle use.

Finally, a 24" x 36" Pocket Map is included with this document that can serve as a "stand-alone" Executive Summary. It contains a large-scale map of the proposed bikeway system, graphic descriptions of the bikeway types and a CIP list of all proposed bikeway segments with their estimated costs.

1

Introduction

1.1 Project Scope

This study is an update of the 1990 "Master Bikeway Plan and Engineering Feasibility Study for the City of Encinitas." The project scope included documenting and evaluating Encinitas' existing bikeway facility system and its relationship with other systems, such as mass transit, and recommending improvements wherever appropriate. This resulting document should be responsive to any General Plan changes that will affect circulation patterns.

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 2004/2005 fiscal year began on July 1, 2004. Cities applying for 2004/2005 BTA funds must have a bikeway master plan adopted by July 1, 2000. This four year cycle should help to make certain that General Plan changes affecting bicycle transportation will be accommodated in a timely manner.

1.2 Project Study Area

The project study area was the City of Encinitas and its planning sphere of influence over adjacent unincorporated County areas. Adjoining area's bicycle systems were evaluated for opportunities as connections with Encinitas and to extend the regional network via Encinitas' bikeway system. (See Figure 1-1: Project Location and Figure 1-2: Existing Bikeway Facilities.)

1.3 Methodology

The project methodology included a review of applicable documents, field work, a mail-in survey questionnaire and geographic information systems (GIS) analysis of the field work data. Encinitas' existing bikeway system was analyzed for a number of factors using both traditional field survey and GIS techniques.

1.3.1 Literature Review

Applicable sections of documents related to Encinitas' bikeway system are excerpted in Chapter 2: Background Information. These include the current City of Encinitas General Plan, the 1990 Master Bikeway Plan and Engineering Feasibility Study for the City of Encinitas, as well as neighboring community, regional and state plans and guidelines.

Figure 1-1: Project Location

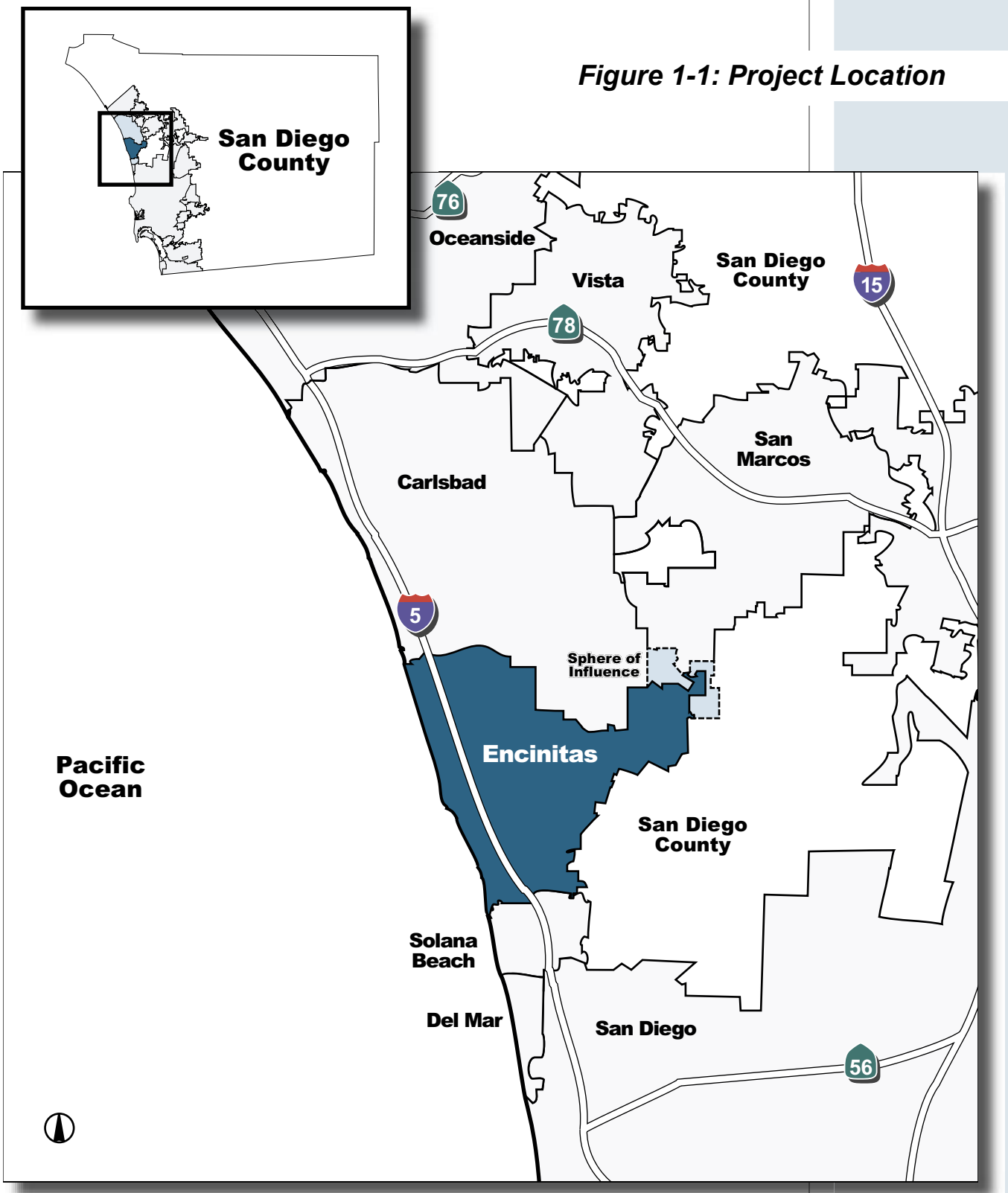


Figure 1-2: Existing Bikeway Facilities

1.3.2 Field Work

During the initial field work, all mapped routes were driven to verify accuracy with respect to existing bikeway mapping data. Consultant also rode many of these routes, 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.

1.3.3 Current Bike Use

During field work, consultant staff saw considerable bicycle use in the City of Encinitas, primarily along the Coast Highway 101 corridor, including Vulcan Avenue. Some were commuting cyclists, but many more were "serious" cyclists on training rides. Recreational cyclists were regularly seen on Coast Highway 101, primarily south of K Street.

It is possible that more use is evident in other sections of Encinitas during the early mornings and late afternoons when commuters and school children would be more likely to be using their bikes for transportation. There is also likely to be a greater weekend distribution of recreational cyclists across the City, but particularly in western Encinitas along the coast where the roadways are flatter.

Overall, there appears to be a higher level of bicycle use in Encinitas than in any other city for which the consultant has conducted bikeway master planning studies.

1.3.4 Community Meetings and Survey Questionnaire

Two community meetings were held at City Hall in March and June, 2004 to gather input from local cyclists to take advantage of their familiarity with the existing bikeway system.

A questionnaire was developed to reveal as much as possible about current user numbers, user types, preferred facility types and times of use. The questionnaire was distributed at community meetings. Copies were also placed at area bicycle shops and City facilities such as libraries and community centers.

An entire chapter of this document is devoted to the participating citizens' indispensable contributions, which helped form the foundations for the overall project. (See Chapter 7: Community Input.)

City of Encinitas

Bikeway Master Plan Update

Community Workshop Notice

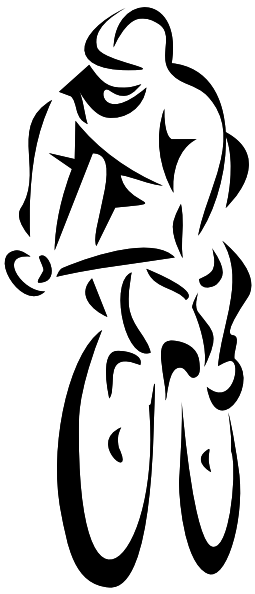
Tuesday, March 30th, 6:00 PM

505 South Vulcan

Civic Center - Poinsettia Room

The City of Encinitas is updating its Bikeway Master Plan and community meetings are an important part of the update process. The City values your opinion and the consultant needs the perspective of local cyclists. We're particularly interested in what you think of existing bike facilities and where new bike facilities might be needed and why.

This workshop will be an open forum where you can talk directly with the consultants, KTU+A, and view their analysis. Verbal and written comments are welcome. A quick overview of the project will be presented first and after that, you can come and go as you please until 7:30 PM. Please attend and help develop a workable bikeway system for the City of Encinitas.



City of Encinitas Contact Person: J. Alfred Dichoso (760) 633-2681

1.3.6 Geographic Information Systems

An industry textbook describes geographic information systems (GIS) as "An organized collection of computer hardware, software, geographic data and personnel designed to efficiently capture, store, update, manipulate, analyze and display all forms of geographically referenced information." While this definition is technically accurate, it may be rather perplexing for the layperson. Basically, a GIS is a computerized map with various types of associated information attached to specific places on the map. Using a computer system configured for the purpose, a user can query the GIS about the place in question and selectively call up its associated information.

A GIS is much more than just a computer system for making maps. It is an analytical tool that allows the user to identify spatial relationships between map features. A GIS does not store a map in the conventional sense, nor does it store a particular image or view of a geographic area. Instead, a GIS stores the data from which a user can draw a desired view to suit a particular purpose. The majority of the maps in this report were generated from a single data base compiled specifically for this project. With a computer system capable of holding and using data describing specific features on a map, a user can overlay a number of related data layers to represent the many interrelated characteristics of the feature in question. The real value of GIS is its ability to overlay information from multiple sources over a map feature, often revealing relationships that would not otherwise have been noticeable. Several data sources were used to contribute to the GIS data base for this project. Land use data were acquired from SANDAG and roads data from the City of Encinitas.

Having a bikeway GIS coverage layer allows the City to take advantage of its GIS capabilities to keep accurate records of existing bikeway conditions, to perform analyses and to develop future projects. Consultant staff coded bikeway data to the most accurate roadway information so the City will have a viable bike facility coverage layer incorporated into its GIS system. In addition, this information can be used to produce a bikeway map for general distribution.

Downtown Encinitas - Highway 101 at D Street

1.4 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. Training, 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.

1.5 Issues

The issues addressed by this master plan were partially defined by public input, including the following:

1.5.1 Bikeway Conceptual Framework

The design of a community-wide bikeway system can be driven by priorities such as cost, safety and efficiency. Making planning decisions based on any one of these concerns necessarily impacts the remaining concerns. For example, it is unlikely that the safest bikeway will also be the least costly, or that the most efficient will be the safest.

1.5.2 Cyclist Types: Commuter, Recreational or "Serious"

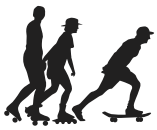
There is no "typical" cyclist. Cyclists vary widely in age, cycling ability, experience, and traffic judgment, and cycle for a variety of different reasons. The planning process must reflect this fact and its design ramifications. (See Figure 1-3: Bikeway User Profiles.)

The team's approach in making planning decisions took this diversity into account. The planning team's cycling background mirrors the full range of cycling experience, including commuting, recreational (off- and on-road), and physical fitness-oriented cycling.

1.5.3 Pathway Crossings and Intersections

The design of intersections, their signage and traffic signals is very important to the proper functioning of an urban bikeway system. A high proportion of crashes involving bicycles occur at intersections, including crossings with pedestrian corridors. The conflicts are not solely with motor vehicles. (See Chapter 5: Safety Analysis.)

Figure 1-3: Bikeway User Profiles

		Typical Ages	Preferred Facility	Typical Usage	Days per Week	Speed Range	Average Distance	Typical Origins and Destinations
Kids		6-16	Sidewalks, trails, quiet streets, flat terrain (Class I)	Early weekday mornings and afternoons, weekends	5-6	4-8 mph	1-2 miles	Residences, schools, parks, open space, retail centers
Family Recreational		6-65+	Quiet streets, scenic trails, flat terrain (Class I)	Weekends, occasional early evenings	1	5-10 mph	2-4 miles	Residences, parks, open space
Adult Exercise		25-65+	Quiet streets, scenic trails, flat terrain (Class I & II)	Weekends, occasional early evenings	1-2	8-15 mph	5-20 miles	Residences, parks, open space
Commuters		18-55	Streets, bike lanes, direct arterial routes (Class II & III)	Early weekday mornings and late afternoons	4-6	10-20 mph	3-20 miles	Residences, employment centers, retail centers
Serious Cyclists		18-55+	Arterials, flat or hilly circuitous routes (Class II & III)	Weekday mornings and late afternoons, weekends	2-5	12-25 mph	20-75 miles	Residences (Rides typically originate or extend outside city)
Skaters Skateboarders		8-45	Quiet streets, paved trails, flat terrain, (Class I)	Weekends, occasional early evenings	1-2	5-15 mph	2-5 miles	Residences, schools, parks
Joggers		18-55	Sidewalks, scenic trails, flat terrain (Class I)	Early weekday mornings and late afternoons, weekends	3-6	5-9 mph	3-5 miles	Residences, parks, open space
Recreational Walkers		16-70+	Sidewalks, Scenic trails, flat terrain (Class I)	Weekday mornings and late afternoons, weekends	2-5	3-5 mph	1-2 miles	Residences, parks, retail centers
Exercise Walkers		16-70+	Sidewalks, scenic trails, flat terrain (Class I)	Weekday mornings and late afternoons, weekends	2-5	4-7 mph	2-4 miles	Residences, parks, open space

The team's approach addressed the fact that conflicts generally occur at intersections or crossings. Existing and potential conflicts were carefully evaluated, whether involving motor vehicles or pedestrians. The planning team identified these conflicts with the help of City Staff, the Sheriff's Department, community meeting participants and questionnaire respondents. The planning team also performed extensive site observation as cyclists. The team then made recommendations to overcome recognized conflicts in a manner consistent with the conceptual framework.

1.5.4 Integration with Other On-going Studies

The planned bikeway system is intended to connect and service major bicycle traffic generators and destinations, some of which are still in the planning stages. These projects will have an impact on bikeway use levels and must be thoroughly addressed.

The team's approach included the identification, with the help of City Staff, of any on-going studies of potential bicycle traffic generators or destinations. These studies were carefully reviewed so that the traffic impacts of the proposed facilities can be taken into account for this master plan. (See Chapter 2: Background Information.)

1.5.5 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 9: CIPs and Bikeway Funding.)

Specifically, proposed bikeway facilities will 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.

1.5.6 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.

1.5.7 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. The input of local cyclists was also sought in the planning process, making full use of valuable local knowledge.

1.6 Project Goals

The following project goals were developed in close cooperation with City staff. These goals are the fundamental criteria for the City of Encinitas' 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 facility 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.

1.7 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 Figure 1-4: Bikeway Facility Types below and accompanying example photos on the following page.)

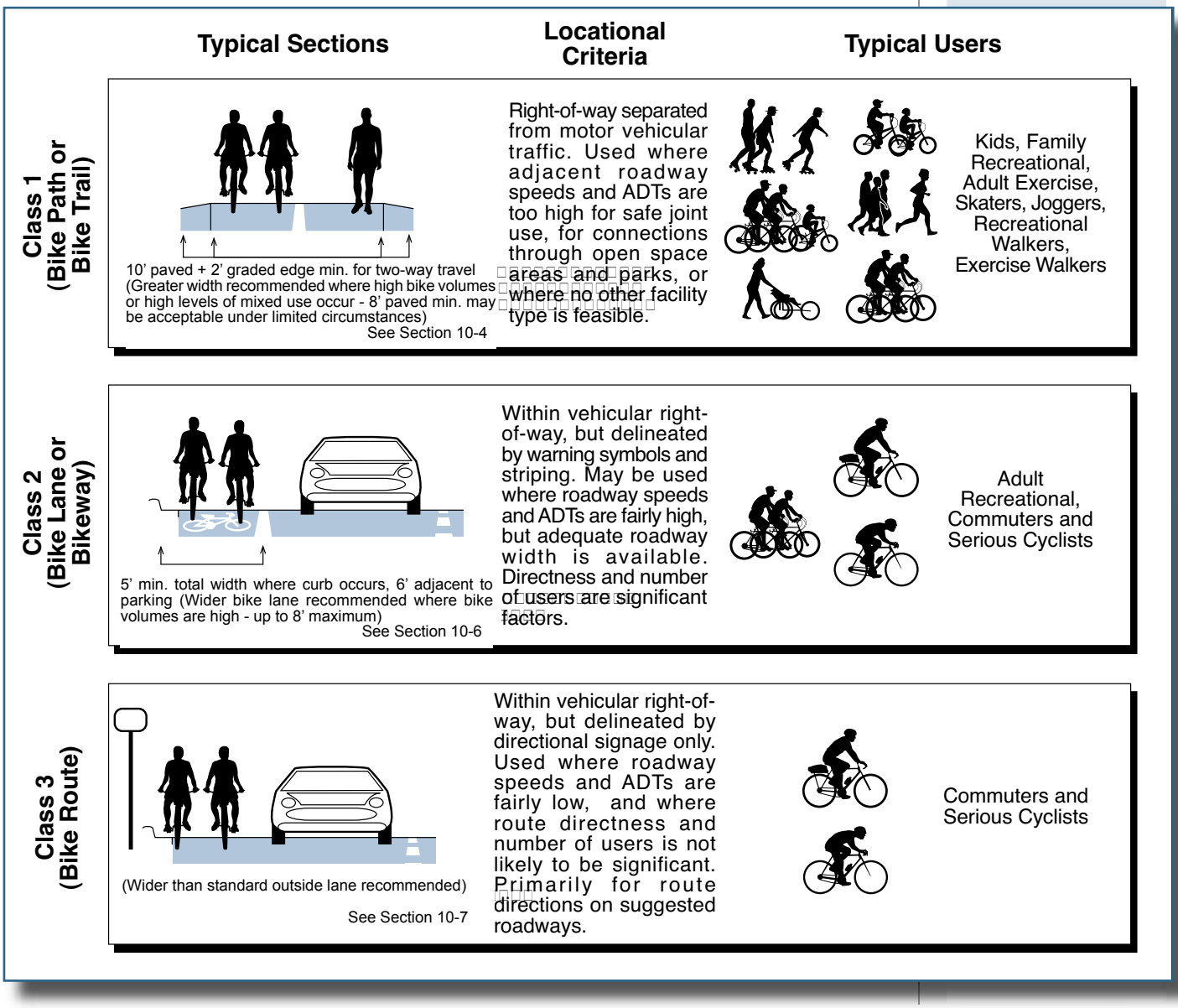
1.7.1 Bikeway Facility Types

Class 1 – Paved "Bike Path" within an exclusive right-of-way, physically separated from vehicular roadways and intended specifically for non-motorized use

Class 2 – Signed and striped "Bike Lane" within a street right-of-way

Class 3 – "Bike Route" within a street right-of-way identified by signage only

Figure 1-4: Bikeway Facility Types



"Class 1 path" along Coast Highway 101

Class 2 lane on K Street

Class 3 route on Coast Highway 101

The photographs at left are examples of bikeway facilities in Encinitas, There are currently no Class 1 facilities in Encinitas. The example at right meets Caltrans standards only in being separated from the adjacent roadway. To fully comply with Caltrans standards for a Class 1 bikeway facility, it would need to be considerably wider and have barriers between it and the roadway, or be further offset from the roadway.

1.7.2 Associated Agencies

California Department of Transportation (Caltrans)

Caltrans is the state's manager of interregional transportation services and is responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state's boundaries, including promoting the use of alternative modes of transportation. Caltrans coordinates and distributes federal bikeway funding in California and reviews all bikeway master plans.

North County Transit District (NCTD)

NCTD buses carry passengers in the north San Diego County region, which includes the area south to and including Del Mar, east to Escondido, north to the Orange County and Riverside County lines, and includes Camp Pendleton. The region is more than 1,000 square miles in area and has a population of approximately 800,000 people. NCTD's bus fleet carries more than 11 million passengers every year.

NCTD has 159 vehicles in its bus fleet. All standard buses are equipped with bike racks. NCTD's bus system has 56 routes. In addition, NCTD runs special express buses for certain sporting and special events in San Diego. (See Chapter 4: Multi-Modal Analysis.)

San Diego Association of Governments (SANDAG)

SANDAG is an association of the 18 cities and county government in the San Diego region. SANDAG directors are mayors, council members, and a county supervisor representing each of the area's 19 local governments. This public agency serves as the region's primary planning and research organization developing strategic plans, obtaining and allocating resources, and providing information on a broad range of topics pertinent to the San Diego region's quality of life. SANDAG administers the $3.3 billion TransNet program, the region's ½-cent sales tax dedicated to regional transportation projects. All San Diego County's 18 cities and county communities benefit from the TransNet program which has helped fund a variety of highway, transit, local streets and roads, and bicycle projects throughout the region. One million dollars per year are set aside for bicycle projects.

California Coastal Commission (CCC)

Pursuant to the California Coastal Act of 1976, the California Coastal Commission, an independent, quasi-judicial state agency, carries out the plans and regulations of the land and water use in the coastal zone. Implementation of Coastal Act policies is accomplished primarily through partnership with each coastal city and their individual adopted Local Coastal Programs, including Encinitas.

The City of Encinitas Local Coastal Program (LCP) is composed of a Land Use Plan and an Implementation Plan. The Land Use Plan includes issues and policies related to the requirements of the Coastal Act. Because the majority of the City lies within the boundaries of the Coastal Zone, the Land Use Plan has been included within the City's General Plan, creating a combined document. The LCP text is backshaded in the General Plan. The LCP Implementation Plan consists of portions of the Encinitas Municipal Code and also includes the Downtown Encinitas Specific Plan, the Encinitas Ranch Specific Plan and the North 101 Corridor Specific Plan.

2

Background Information

This chapter is a compilation of applicable excerpts of reviewed documents pertaining to this bikeway master plan. Documents include the City of Encinitas General Plan, as well as regional and state bikeway references.

2.1 City of Encinitas General Plan • 1989

Issues and Opportunities

Railroad Right-of-Way
The limited number of railroad crossings acts as a deterrent to east-west pedestrian and vehicular movement, but is also a potentially valuable area for the establishment of a riding/walking/cycling path for north-south movement near the coast. Efforts are underway to establish this north-south alignment as the Coastal Rail Trail. Additionally, pedestrian "undercrossings" are seriously being considered at Santa Fe and Montgomery Avenues in Cardiff-by-the-Sea, and near Paul Ecke Central Elementary School in Leucadia.

Circulation Element

Introduction to the Circulation Element
A sound, safe and sensible circulation system that promotes the efficient movement of people and goods in around the City is the main goals of this Element. The Circulation Element is also concerned with establishing policies and programs which will ensure that all components of the system will meet the future transportation needs of the City of Encinitas.

Items of particular concern to the City of Encinitas include:

• Providing bicycle, pedestrian, equestrian and handicapped facilities.

The Circulation Element addresses the circulation improvements needed to relieve congestion, to provide mass transit services, and to lessen long-term air quality impacts related to transportation.

Circulation Element Goals and Policies
The following goals and policies included in this Element address a wide range of issues concerning circulation in and through the City. More efficient movement of traffic

on existing roadways, the establishment of standards for future roads, provision of other forms of transit, preservation of scenic highways, and improved coastal access are the major areas of concern of the following goals and policies.

Safe, Convenient, and Efficient Transportation System
The following goal and supporting policies emphasize the need to maintain a transportation system that is capable of handling the existing and projected traffic loads in the City. To achieve this end, a number of policies have been adopted that call for more efficient use of existing roadways by employing measures that improve the movement of traffic.

Goal 1: Encinitas should have a transportation system that is safe, convenient and efficient, and sensitive to and compatible with surrounding community character. (Coastal Act/30252)

Policy 1.1: Ensure that the arterial circulation system provides adequate connections across the freeway for convenient circulation and rapid emergency access.

Policy 1.4: Require, where feasible, interconnecting off-street pedestrian and vehicular circulation between adjacent commercial and office land uses. This policy should be required along major transportation corridors to minimize traffic conflicts associated with pedestrian and vehicular movement to and from these properties. (Coastal Act/30252)

Policy 1.9: Minimize private driveway access onto major and collector roads.

Policy 1.10: Encourage the design of roads and traffic controls to optimize safe traffic flow by minimizing turning, curb parking, uncontrolled access, and frequent stops.

Policy 1.15: The City will actually support an integrated transportation program that encourages and provides for mass transit, bicycle transportation, pedestrians, equestrians, and car-pooling. (Coastal Act/30252)

Policy 1.17: Standards shall be established and implemented to provide for adequate levels of street lighting, based on criteria of safety and related to volumes of vehicular, pedestrian and bicycle activity and potential points of conflict.

Policy 1.19: The City will provide for adequate levels of maintenance of all improved components of the circulation system, such as roadways, sidewalks, bicycle facilities, roadway drainage systems, pedestrian trails, recreational trails, bicycle trails and facilities.

Roadway Function and Standards
Different types of roadways have distinctly different functions and these differences need to be recognized in planning for new roadways and improvements to existing ones. The following policies provide the framework for roadway standards described in the Circulation Plan included in this Element.

Goal 2: The City will make every effort to develop a varied transportation system that is capable of serving both the existing population and future residents while preserving community values and character. (Coastal Act/30252/30253)

Policy 2.8: Where necessary, require acquisition of right-of-way as a condition of approval of all final subdivision maps. Encourage landscaping of rights-of-way if not being used for public roads, hiking/riding trails or beach access trails.

Policy 2.20: When major roads must pass through neighborhoods, large right-of-way widths should be acquired to allow for landscaping, trails, etc., to offset and minimize disruption to the community.

Alternate Modes of Transit
The private automobile will continue to be the dominant form of transportation in the Planning Area in coming years. A primary focus of the following policies is to encourage people to utilize other forms of transportation and to accommodate those households that rely on public transit.

Goal 3: The City of Encinitas will promote the use of other modes of transport to reduce the dependence on the personal automobile. (Coastal Act/30252)

Policy 3.4: Cooperate with San Diego County, SANDAG, and other jurisdictions to help plan and implement a regional multi-modal transportation system that is accessible to residents in the City (Coastal Act/30252). This policy is mentioned in the context of SANDAG's forthcoming Regional Transportation Plan (RTP) and Encinitas' contribution to SANDAG's Bicycle and Pedestrian Working Group that assists in the development of the bicycle facilities portion of the RTP and recommends projects for funding under the TransNet local transportation sales tax program and other state and federal funding programs.

Policy 3.11: The City will strive to implement a safe, direct, and convenient circulation system for commuting and recreational bicycle traffic. The City will support the development of additional bicycle facilities in the Coastal Zone, including the following:

• All Circulation Element roads will include provisions for bicycle lanes unless precluded by design and safety considerations in which cases, alternative routes shall be provided to form a continuous network.

• The provision of secure bicycle storage facilities at all beaches designated for high and moderate levels of use; and

• The installation of bicycle and surfboard racks on all buses serving the Coastal Zone. (Coastal Act/30252)

Scenic Highways
The preservation and maintenance of scenic highways is emphasized in the following policies as well as policies included in the Resource Management Element. In addition, future road improvements should include design features that enhance the communities through which they pass.

Goal 4: The City should make every effort to develop a circulation system that highlights the environmental and scenic amenities of the area. (Coastal Act/30251)

Policy 4.3: Separate pedestrian, bicycle and vehicular traffic by encouraging adequate space for walking and biking by striping roadways, excepting freeways. (Coastal Act/30252)

Policy 4.4: The City has adopted a Citywide Recreation Trails Master Plan to establish a separate system of hiking trails, bicycle paths and equestrian trails from which motorized vehicles shall be banned. The general location and type of each trail is shown on the Recreational Trails Master Plan Map (Recreation Element, Figure 3). Any proposed modifications or additions to the Recreational Trails Master Plan or Recreational Trails Master Plan Map that may directly affect coastal zone resources shall require an LCP amendment.

Policy 4.5: Design and construct attractive bike paths and pedestrian ways along existing freeway overpasses and underpasses. Discourage separate pedestrian overpasses. (Coastal Act/30252)

Policy 4.14: Where feasible, minimize the dependence on private motor vehicles. (Coastal Act/30252)

Leucadia Boulevard East of I-5
The objectives in the design and improvement of the Leucadia Boulevard link are to provide a truly scenic roadway; to fit and reflect the community character; to mitigate all possible negative effects on surrounding neighborhoods from noise, traffic, light and visual blight by providing substantial design and landscaping amenities; and to create a visual asset to the community.

Goal 5: Leucadia Boulevard between I-5 and Olivenhain Road is planned as a Major Arterial-Augmented. Prior to any improvements of any portion of this link above the capacity (at LOS "D") of a two-lane local roadway, all of the following policies shall be satisfied:

Policy 5.3: Full design and improvement plans for the length of Leucadia Boulevard between I-5 and Olivenhain Road shall be a scenic highway, completed and adopted by the City, subject to the following:

A. Design will include full landscape/streetscape design, bicycle and pedestrian facilities, recreational trails where appropriate, and intersection improvements including left and right turning movements. Where facilities cannot be accommodated within the right-or-way, additional easements/right-of-way may be required.

Circulation System Plan
The development of a comprehensive network of bikeways is proposed in this plan. This system will serve a dual purpose in that it's function is to provide residents a safe and efficient alternative to the private automobile for travel within the City as well as providing for recreation.

The bikeway system will consist of three types of facilities which are shown in cross sections included in Figure 6 and their locations are indicated in Figure 7. The three types of roadways include:

• Bike Path (Class I): This is a special type of facility that is designed for exclusive use by bicyclists. A bike path may be located adjacent to a roadway though it is physically separated from vehicular traffic by a barrier, grade separation, or open space. Cross flows by vehicles and pedestrians are allowed but minimized.

• Bike Lane (Class II): A bike lane consists of a paved area for preferential use of bicycles and is located between the travel lane closest to the curb and the curb. Pavement markings and signage indicate the presence of a bike lane on the roadway.

• Shared Route (Class III): This type of bicycle facility refers to a conventional street where bike routes are indicated by sign only. There are no special pavement walkways and bicycle traffic shares the roadway with motorized traffic.

In addition to the bikeway system, a planned pedestrian circulation system consisting of connecting sidewalks along circulation system streets and a planned Citywide system of recreational trails, will be linked together. The recreational trail system may also accommodate bicycles and equestrians. The installation of significant lengths of sidewalk along Circulation Element roads, as well as the improvement of substantial reaches of trail is planned. This system will promote pedestrian safety throughout the City by providing greater separation from vehicular traffic.

Recreation Element

Preservation of Open Space Resources
The following goal and supporting policies are directly linked to corresponding policies in the Land Use, Resource Management, and Public Safety Elements. The preservation of culturally and naturally significant lands is identified as being a major priority of the City and

this objective is underscored once again in the policies below. Many of the open space areas lie within flood plains, have steep topography or are otherwise constrained and provide the City with a unique opportunity to develop a system of trails, bikeways, and establish new parks for both passive and active recreation.

San Dieguito Riders Trails Plan: The San Dieguito Riders, an organization of local residents interested in equestrian activities, prepared a plan for a comprehensive system of trails that may be used by equestrians, hikers, and bicyclists. The plan identifies measures that can be utilized for the acquisition and/or use of rights-of-way as well as standards for the development of these trails.

Goal 2: The City will make every effort to preserve open space areas that represent a significant environmental resource in the community. (Coastal Act/30240)

Policy 2.2: Provide and maintain an inter-linking network of trails for horseback riding, hiking, and bicycling; and minimize the cost of the trail system by encouraging the use of drainage channels, flood plains, existing trails, public land, excess street rights-of-way, and major utility rights-of way. (Coastal Act/30212.5/30252)

Policy 2.3: Encourage the preservation and protection of areas for the recreational activities characteristic of Encinitas such as horseback riding, surfing, skin diving, bicycling, walking, and jogging. (Coastal Act/30212.5/30252)

Coastal Resources
The beaches have been and will continue to be a major recreational resource in the City. A number of policies include d in the Resource Management Element are concerned with the preservation and maintenance of beaches and the coastline so that future generations may also enjoy beach recreation. The following policies indicate ways access to and from the beaches can be expanded and establish standards concerning the intensity of use for individual beaches under the City's jurisdiction.

Goal 5: The City will continue to provide or coordinate with the State to provide for coastal/shoreline recreation areas, with effective access, including signing; and will designate various beach areas for high, medium and low intensity levels of use based upon the characteristics of the beach resource and support facilities, and character of adjacent neighborhood. (Coastal Act/30211/30212/30212.5/30214)

Policy 5.5: The City will adopt beach recreation facility standards, and will encourage the State to apply similar standards to its beaches, regarding the existence of bikeway facilities.

2.1.1 City of Encinitas Local Coastal Program

The City of Encinitas incorporated on October 1, 1986. Approximately two-thirds of the City is comprised within the defined Coastal Zone. In the Coastal Zone, the City has authority to issue Coastal Development Permits consistent with the State's Coastal Act. However, in the Coastal Appeal Zone, located in a few areas of the Coastal Zone, the Coastal Commission retains authority to appeal project decisions made by the City. Portions of the bikeway system are located within the Coastal Appeal Zone.

Local Coastal Programs are the basic planning tools used by local governments to guide development in the coastal zone, in partnership with the Coastal Commission. The City of Encinitas LCP contains the ground rules for future development and protection of coastal resources in Encinitas. The LCPs specify appropriate location, type, and scale of new or changed uses of land and water.

If the proposed project (which may include a bike facility) is located outside of the Coastal Appeal Zone, the City's decision to either approve or deny approval for a project is final and is not an appealable action by the Coastal Commission. On the other hand, if the proposed

project (which may include a bike facility) is located in the Coastal Appeal Zone, the City's decision would be appealable to the Coastal Commission consistent with the provisions of the California Coastal Commission Code of Regulations.

2.1.2 General Plan and Local Coastal Program Consistency

The Circulation Element proposes the adoption of a bikeway facility system to provide residents a safe and efficient alternative to the private automobile for travel within the city. The backshaded portions of the Circulation Element are part of the city's Local Coastal Program (LCP) Land Use Plan (LUP). The LUP consists of the "relevant portions of a local government's general plan...which are sufficiently detailed to indicate the kinds, location, and intensity of land uses, development policies, and, where necessary, a listing of implementing actions." (LU-2a). The Bikeway Master Plan (BMP) is one of those implementation actions.

The recommended bicycle facilities system closely follows the generalized system map shown as Figure 7 of the Circulation Element of the General Plan, and promotes Circulation Element Policies 1.15, 3.11, 4.3, and 4.5. Therefore, the BMP is consistent with the City's General Plan and Local Coastal Program LUP. The BMP is also consistent with the adopted Downtown Encinitas Specific Plan, the North 101 Corridor Specific Plan, and the Encinitas Ranch Specific Plan.

2.2 North 101 Corridor Specific Plan • 1997

4.7 Streetscape Concepts

4.7.1 Introduction

The purpose of this section is to provide recommendations for the streetscape design in the North 101 Corridor Specific Plan area. The information provided in this section identifies and coordinates the streetscape design elements of paving (sidewalks and crosswalks), street trees, street furniture, lighting, median treatments, special intersection treatments, signs, and a linear park adjacent to the railroad tracks.

These recommendations will be used by the City in establishing capital improvement projects and revising streetscape standards for the area, and as a guide for informing private developers about some of their "off-site" improvement responsibilities.

All of the streetscape and right-of-way modifications identified in this section will occur within the public right-of-way and will be primarily initiated through the City's Capital Improvement Program process. However, when opportunities arise where private developments are occurring, developers may be required to install these "off-site" improvements as part of their conditions of approval.

4.7.4 Streetscape Design Concepts

The overall general streetscape recommendations for the North 101 Corridor area shall include:

C. Seating Nodes - create seating nodes at Leucadia Roadside Park and along the linear park that include benches and bike racks. Avoid seating that is open and parallel to the line of sidewalk to avoid skateboard abuse.

5.1 Introduction

The Circulation Plan provides directives intended to promote the efficient and safe movement of people and goods within the North 101 Corridor Specific Plan Area. In addition, it establishes policies and programs which will ensure that all components of the transportation system meet the future transportation needs of the City.

• Improvements to the bikeway system/network are identified in order to address deficiencies located throughout the specific plan area.

5.4 Bicycle Facilities
The recommended bikeway system within the plan area consists of a combination of a Class 1 path and Class 2 bike lanes. The predominantly used bike route within the plan area is the North 101 Corridor.

Recommendations:
• Provide a multi-modal recreational path within the railroad right-of-way east of North Highway 101 (See Section 4.7 Streetscape Concepts). This facility is will be designed as a Class 1 bicycle path. This bike path will replace the existing inadequately designed Class 1 facility generally located along North Highway 101 and El Portal Street.

• Provide a Class 2 bike lane along the northbound and southbound lanes of North Highway 101 (See Section 4.7 Streetscape Concepts). A bike lane will be provided along the southbound travel lanes and parallel parking will be permitted on the west side of Highway 101. A bike lane will also be provided along the northbound travel lanes and no curbside on-street parking will be permitted along the east side of North Highway 101. Note that the parking alcoves along the east side of Highway 101, which are included in the streetscape concept, will be allowed and shall be designed to accommodate the Class 1 bike path within the railroad right-of-way and the Class 2 bike lane along North Highway 101.

• Provide a Class 2 bike lane along the northbound and southbound travel lanes of Vulcan Avenue. On-street parking will be permitted on the east side of North Vulcan Avenue (See Section 4.7 Streetscape Concepts).

The recommended bikeway system within the plan area is consistent with facilities outlined in the Circulation Element of the City of Encinitas General Plan, and the Master Bikeway Plan and Engineering Feasibility Study for the City of Encinitas.

9.0 General Plan and Local Coastal Program Compliance

9.3 Circulation
Goal 1: Encinitas should have a transportation system that is safe, convenient and efficient and sensitive to and compatible with surrounding community character. (Coastal Act/30252)

Policy 1.15: The City will actively support an integrated transportation program that encourages and provides for mass transit, bicycle transportation, pedestrians, equestrians and car-pooling. (Coastal Act/30252)

Policy 1.19: The City will provide for adequate levels of maintenance of all improved components of the circulation system, such as roadways, sidewalks, bicycle facilities, roadway drainage systems, pedestrian, recreation trails, bicycle trails and facilities.

Goal 2: The City will make every effort to develop a varied transportation system that is capable of serving both the existing population and future residents while preserving community values and character. (Coastal Act/30252/30253)

Specific Plan Compliance: Streetscape and street improvements outlined in Section 4.7 and in Chapter 5.0, respectively, will reduce congestion, provide increased on-street parking, improve bicycle facilities and create a safer pedestrian environment.

Goal 3: The City of Encinitas will promote the use of other modes of transport to reduce the dependence on the personal automobile. (Coastal Act/30252)

Policy 3.4: Cooperate with San Diego County, SANDAG and other jurisdictions to help plan and implement a regional multi-modal transportation system that is accessible to residents of the City. (Coastal Act/30252)

Policy 3.6: The City should provide and encourage efficient links between possible rail transit service and other transportation modes, including rerouting of bus service to interface with transit stops.

Policy 3.11: The City will strive to implement a safe, direct and convenient circulation system for commuting and recreational bicycle traffic. The City will support the development of additional bicycle facilities in the Coastal Zone, including the following:

• All Circulation Element roads will include provisions for bicycle lanes unless precluded by design and safety considerations in which cases, alternative routes shall be provided to form a continuous network.

• The provision of secure bicycle storage facilities at all beaches designated for high and moderate levels of use; and

• The installation of bicycle and surfboard racks on all buses serving the Coastal Zone. (Coastal Act/30252)

Specific Plan Compliance: Streetscape and street improvements outlined in Section 4.7 and in Chapter 5.0, respectively, will improve bicycle facilities and create a safer pedestrian environment.

Goal 4: The City should make every effort to develop a circulation system that highlights the environmental and scenic amenities of the area. (Coastal Act/30252)

Policy 4.3: Separate pedestrian, bicycle and vehicular traffic by encouraging adequate space for walking and biking by striping roadways, excepting freeways. (Coastal Act/30252)

Policy 4.4: Where possible, establish a separate system of hiking trails, bicycle paths and equestrian trails from which motorized vehicles shall be banned.

Policy 4.14: Where feasible, minimize the dependence on private motor vehicles. (Coastal Act/30252)

Specific Plan Compliance: As mentioned above, a linear park with a multi-modal recreational path extending from La Costa Avenue to Encinitas Boulevard is proposed within the railroad right-of-way.

Streetscape and street improvements outlined in Section 4.7 and in Chapter 5.0, respectively, will reduce congestion, provide increased on-street parking, improve bicycle facilities and create a safer pedestrian environment.

The proposed mixed use development in the specific plan area will provide more opportunities for live/work situations to occur, as well as residential uses which are closer to the commercial and office professional uses. This will help reduce dependence on the private motor vehicle.

9.6 Recreation
Goal 1: The maintenance of the open space resources in the planning area will continue to be emphasized. (Coastal Act/30240)

Policy 1.16: Future trails in addition to those planned for in this element may be added to the existing systems to enhance the recreational opportunities of the City.

Specific Plan Compliance: The proposed linear park within the railroad right-of-way will provide an opportunity to provide needed open space and some active and passive recreational activity such as jogging, bicycling and walking.

Goal 2: The City will make every effort to preserve open space areas that represent a significant environmental resource in the community. (Coastal Act/30240)

Policy 2.2: Provide and maintain an inter-linking network of trails for horseback riding, hiking and bicycling and minimize the cost of the trail system by encouraging the use of drainage channels, flood plains, existing trails, public lands, excess street rights-of-way and major utility rights-of-way. (Coastal Act/30212.5/30252)

Policy 2.3: Encourage the preservation and protection of areas for the recreational activities characteristic of Encinitas such as horseback riding, surfing, skin-diving, bicycling, walking and jogging. (Coastal Act/30212.5/30252)

Specific Plan Compliance: The proposed linear park within the railroad right-of-way will provide an opportunity to provide needed open space and some active and passive recreational activity such as jogging, bicycling and walking. The multi-modal recreational path within the linear park will provide linkage to a regional trail system both to the north and to the south of Encinitas as well as provide linkage to other recreational destinations within the surrounding area such as beacon access points and Moonlight State Beach and Park.

2.3 Encinitas Ranch Specific Plan • 1998

2.0 Community Participation

2.2 Community Issues

2.2.2 Circulation
• Expand the City's existing network of bicycle trails and lanes and implement the City's Circulation Plan for bicycle facilities.

2.2.5 Community Facilities and Services
• Expand the city and regional bicycle and pedestrian trail systems.

2.3 Community Goals and Objectives

2.3.2 Circulation
Goal 7: Construct and maintain an adequate community circulation network that is compatible with the regional transportation system.

Policy 7.2: Accommodate alternative modes of transportation through the incorporation of bicycle, equestrian and pedestrian trails and walkways into the project.

Goal 10: Develop a system of bikeways and accompanying bicycle storage areas within the project, tying into the regional bicycle network.

Policy 10.1: Accommodate the needs of bicyclists by developing a plan for safe bicycle facilities including on-street painted bike lanes and off-street bike paths.

Policy 10.2: Encourage businesses and public agencies to provide bicycle storage areas for their employees and customers.

Goal 12: Provide trail systems which will encourage and provide for the on-site use of alternate modes of transportation (e.g., bicycles, pedestrian, equestrian).

Policy 12.2: Provide recreational trail connections to the City's and County's regional trail network within the project area.

Goal 17: Minimize land use conflicts with existing nearby residential development; design sufficient buffers.

Policy 17.3: Linkages should be created from existing roads including cul-de-sac roads that end at the project perimeter, as a means of linking nearby residential development with development occurring within the project.

2.3.4 Community Facilities and Services
Goal 18: Provide the necessary infrastructure and services suitable to the needs of the project.

Policy 18.1: Require that new developments size their improvements to adequately serve the long-term infrastructure needs of future projects and City residents.

Policy 18.2: Require that the project contribute its fair-share of funds and/or improvements to meet minimum levels of service for public infrastructure and services as established by the City.

3.0 Specific Land Use Plan

3.3 Planning Areas)

3.3.1 Green Valley Planning Area
Mixed-Use Zone
Residential densities up to 25 dwelling units per acre are permitted for free-standing residential structures in order to minimize reliance on the automobile since residents will be able to walk or bike to a variety of other uses….

The commercial/office development in a mixed-use concept is intended to provide retail and office uses which serve area residents, while maintaining compatibility with a residential environment. The free-standing residential development shall not exceed an overall density of 25 dwelling units per acre. Up to 40 percent of the building footprint for all free-standing residential buildings may exceed two stories in height, although no free-standing residential structure shall exceed three stories in height. The two-story buildings should be concentrated along the greenbelt/recreation area that abuts El Camino Real and adjacent to natural open space areas. Three-story buildings should be concentrated internal to individual parcels and along project area roadways. In no case shall buildings exceed three (3) stories in height.

C. General Planning Standards – Green Valley

The following recreation trail standards shall apply:

b. Recreation trails in natural open space areas shall be sited to avoid, to the maximum extent feasible, adverse impacts to existing native plant materials and wildlife. The City shall not authorize the use of trails in natural open space areas (subject to the open space zone) by horses and non-motorized bicycles unless such use is first reviewed and approved by the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

c. A meandering recreation trail will continue parallel to Leucadia Boulevard within the planned Landscape Development Zone. The trail shall be a minimum of eight (8) feet in width to allow simultaneous use by both bicycles and pedestrians.

3.3.5 Sidonia East Planning Area

General Planning Standards – Sidonia East
5. A pedestrian and bicycle accessway shall be created between Sidonia Street and Quail Gardens Drive, south of Leucadia Boulevard, at the location depicted in Figure 13. This accessway shall be located within an open space/greenbelt area which will provide a view

corridor to the golf course and may include limited park or recreation facilities which encourage pedestrian use. No automobile or motorized vehicle access or parking shall be permitted at this location.

3.3.8 Quail Gardens East Planning Area

3.0 Circulation Plans

4.1.1 Leucadia Boulevard Improvements
On-street eight (8) foot wide lanes in both directions will be provided along the full length of Leucadia Boulevard within Encinitas Ranch and will function as dual purpose breakdown and bicycle lanes.

4.3 Trails System
In addition to a comprehensive network of vehicular roads, the Encinitas Ranch project will also provide a network of recreation trails for pedestrians, bicycles and horses. These trails allow the public to move freely within the Encinitas Ranch property and allow access to both the natural open space and recreational amenities provided. The system identifies specific trails for pedestrian and combination bicycle and pedestrian use. Horses and non-motorized bicycles may be permitted anywhere on the trail system subject to approval by the City, taking into consideration trail width, surface, maintenance and natural habitat; provided the City shall assume any additional costs of maintenance associated with the allowance of horses and non-motorized bicycles. In addition, the City shall not authorize the use of trails in natural open space areas (subject to the Open Space Zone) by horses and non-motorized bicycles unless such use is first reviewed and approved by the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

An off-street recreation trail shall be located on the west side of Quail Gardens Drive. The trail shall be a minimum of eight (8) foot wide AC (asphalt concrete) surface trail that meanders and provides a linkage to the staging area (parking and trailhead) for the Magdelena Ecke Park.

On-street bicycle lanes will be constructed along Leucadia Boulevard and the extension of Garden View Road.

6.3 Park and Recreation Overlay
6.3.2 Development Standards
D. Bicycle Parking Requirements
1. Bicycle parking shall be stationary storage racks or devices designed to secure the frame and wheel of the bicycle.

2. One (1) space shall be provided for each 33 required automobile spaces, or portion thereof.

6.4 Open Space Zone (“OS” Zone)
6.4.1 Uses Permitted
B. Minor Use Permit
The following uses are permitted provided a Minor Use Permit had been granted pursuant to the Municipal Code.

Bicycle trails and paths for non-motorized equipment and vehicles.

6.4.2 Development Standards
Unless subject to a Park and Recreation overlay, an area designated as Open Space shall be subject to the following development standards:

A. The maximum width of any trail or path located in natural open space areas shall not exceed six (6) feet in width, unless required by the City Engineer or a governmental/quasi-governmental agency for safety or access reasons.

B. Recreation trails in natural open space areas shall be sited to avoid, to the maximum extent feasible, adverse impacts to existing native plant materials and wildlife. The City shall not authorize the use of trails in natural open space areas (subject to the Open Space Zone) by horses and non-motorized bicycles unless such use is first reviewed and approved by the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

C. Vertical grade of trails and paths shall not exceed twenty (20) percent, unless specific exceptions to this standard are approved by the City Engineer.

D. The cross-sectional pitch of any trail shall be one (1) percent minimum to five (5) percent maximum to ensure natural sheet flow to avoid concentration of drainage.

E. Fencing of trails and paths is not desirable and shall not be required unless necessary to limit intrusion into sensitive habitats by humans and domesticated animals, or to separate users of the trails and paths from potentially hazardous conditions such as steep slopes or embankments.

F. Native vegetation shall be planted/maintained adjacent to trails within sensitive habitat areas to discourage uncontrolled access into such areas.

6.8 Commercial Zone ("ER-C" Zone)
6.8.2 Development Standards
F. Off-Street Parking Requirements
8. Bicycle parking shall be provided at one (1) space per fifty required automobile spaces or portion thereof.

7.0 Design Guidelines
7.5.3 General Landscape Guidelines
E. Circulation/Streetscenes
Major Streetscene with Landscape Development Zone (Leucadia Boulevard)
The Leucadia Boulevard streetscape will consist of a Landscape Development Zone (LDZ) which will include a meandering pedestrian/bicycle path. On-street bicycle lanes will be provided on both sides of Leucadia Boulevard. The LDZ along Leucadia Boulevard will vary from thirty (30) feet in width between Sidonia Street, east to the Garden View Road extension, to a thirty-five (35) foot width between the Garden View Road extension and El Camino Real. Paragraph amended 3/18/98 (Reso. 98-17)

8.1 Land Use
Goal 1: Encinitas will strive to be a unique seaside community providing a balance of housing, commercial, light industrial/office development, recreation, agriculture and open space compatible with the predominant residential character of the community.

Project Conformance: In conformance with Land Use Policy 1.7, the Green Valley Regional Commercial Center will be served by El Camino Real and Leucadia Boulevard, two major thoroughfares in the City of Encinitas which will provide convenient access to the Center. The West Saxony mixed-use zone will be easily accessible from Interstate 5, Encinitas Boulevard, and Leucadia Boulevard via Saxony Road. As required by Land Use Policy 1.15, the easy and safe circulation and movement of bicy-clists, pedestrians and the handicapped will be ensured in Encinitas Ranch through the provision of off-street bike paths, pedestrian crosswalks, sidewalks, pedestrian trails, and wheelchair ramps. Paragraph amended 3/18/98 (Reso. 98-17)

Goal 2: The City will make every effort to preserve open space areas that represent a significant environmental resource in the community. (Coastal act/30240)

Policy 2.2: Provide and maintain an inter-linking network of trails for horseback riding, hiking, and bicycling; and minimize the cost of the trail system by encouraging the use of drainage channels, flood plains, existing trails, public lands, excess street right-of-way, and major utility right-of-way. (Coastal Act/30212.5/30252)

Policy 2.3: Encourage the preservation and protection of areas for the recreational activities characteristic of Encinitas such as horseback riding, surfing, skin-diving, bicycling, walking, and jogging. (Coastal Act/30212.5/30252)

Goal 4: The City should make every effort to develop a circulation system that highlights the environmental and scenic amenities of the area. (Coastal Act/30251)

Policy 4.3: Separate pedestrian, bicycle, and vehicular traffic by encouraging adequate space for walking and biking by striping roadways, excepting freeways. (Coastal Act 30252)

8.6 Recreation
Goal 1: The maintenance of the open space resources in the planning area will continue to be emphasized. (Coastal Act/30240)

Project Conformance: The Specific Plan responds to the need for additional recreational facilities within the project area by developing a variety of recreational opportunities for residents of the Specific Plan Area and the City of Encinitas as a whole. An expansive, 18-hole municipal golf course on the mesa will provide golfing opportunities to City residents and attract players from surrounding regions. A public recreation area which includes athletic playing fields is proposed in the eastern section of the Green Valley Planning Area within the 25.6-acre greenbelt/recreation area along El Camino Real. This recreation area will be easily accessible from the adjacent mixed-use and multi-family residential development. A public hiking and biking trail will be incorporated into a linear greenbelt adjacent to the recreation area; the trails in the greenbelt will connect with the project-wide system of trails, on-street bicycle lanes, and sidewalks.

2.4 Downtown Encinitas Specific Plan • 1994

2.2 Issues

Circulation

Pedestrian/Bicycle:
• Bicycle lanes – non-existent or poorly maintained, resulting in interference of traffic flow
• Change existing bikeway location

2.3 Goals and Objectives

Circulation Goals
• Promote a pedestrian oriented circulation system in the specific plan area.

Objective: Provide more hiking/bicycle trails that link major destination points within the specific plan area as well as connect to citywide and regional trail systems.

• Provide for safer pedestrian and bicycle circulation.

Objective: Maintain the existing bikeway on Third Street and establish additional alternate bike routes within the specific plan area.

• Provide bicycle/hiking trail linkages to regional trail systems.

Objective: Coordinate with North County Transit District and other cities in developing a hiking/bicycle trail along the commuter rail corridor connecting Escondido to Oceanside to San Diego.

4.7 Streetscape Concepts

4.7.4 Streetscape Design Concepts
The overall general streetscape guidelines for the downtown Encinitas area shall include:

Theme Colors - select bright or dark blue or green colors for accents such as trash receptacles, tree grates, bike racks, etc.

Seating Nodes - create seating nodes at intersection locations that include benches and bike racks. Avoid seating that is open and parallel to the line of sidewalk to avoid damage by skateboarders.

5.0 Circulation Plan

5.1 Introduction
This Circulation Element provides improvement standards intended to promote the efficient and safe movement of people and goods within the Downtown Encinitas Specific Plan area of the City of Encinitas. In addition, it establishes policies and programs which will ensure that all components of the transportation system meet the future transportation needs for the City.

The Circulation Element addresses several aspects of circulation throughout the Plan Area.

- Streets and highways
- Transit facilities
- Bicycle facilities planning
- Pedestrian circulation

The Circulation Element examines the current condition of the bikeway system/network located throughout the plan area and identifies deficiencies and improvements.

5.2.2 Street Improvements
A. Downtown Area
Street improvements from Vulcan Avenue west, including the commercial core and the Residential West sub-district, should be consistent with the character of the existing residential and commercial neighborhoods. Improvements should provide optimal circulation of traffic, pedestrians, and bicycles. On-street parking should be provided where existing curb-to-curb dimensions allow.

1. Vulcan Avenue
Improvements to Vulcan Avenue between Encinitas Boulevard and “E” Street are indicated in the streetscape section of the Specific Plan (Section 4.7). Improvement standards for the remainder of Vulcan Avenue are described below. These standards describe five distinct “sections” of Vulcan Avenue going southerly from “E” Street. Engineering improvement plans and striping must transition from section to section.

The section of Vulcan Avenue located between “E” Street and McNeill Avenue is contained within an existing 65-foot right-of-way. Concrete curb and gutter and sidewalk are currently installed along the eastern edge, with a 9 foot parkway from back of sidewalk to the east property line. The existing roadway (curb-to-curb) width equals 50 feet. Future improvements

should expand the curb-to-curb width, provide four travel lanes, bike lanes, and concrete curb and gutter along the western edge. The extra roadway width is to be achieved by reconstructing curb and sidewalk on the eastern side further east.

The portion of Vulcan Avenue located between McNeill Avenue and East "F" Street is also currently contained within a 65-foot right-of-way. Ultimate improvements here will transition, from three travel lanes (two northbound) at F Street, to four travel lanes to match the section north of McNeill Avenue. Concrete curbing and bicycle lanes on each side, and sidewalk along the eastern edge will be provided. Excess right-of-way width on the eastern side north of F Street is planned to be vacated, to protect existing private facilities related to the historic "Derby House".

The improvements to the portion of Vulcan Avenue from East F Street southward to East I Street, and from East J Street south, shall be contained within the existing 50-foot right-of-way width. The improvements should include two travel lanes, parallel parking along the eastern edge, bike lanes, concrete curb and gutter on both sides, and concrete sidewalk along the eastern edge. At the northerly portion of this section, improvements will "flare" out to match the section north of East F Street.

The section of Vulcan Avenue from East I Street to East J Street has recently been improved to a 50-foot roadway cross section which includes concrete curb and gutter and sidewalk along the eastern edge. These improvements were installed in conjunction with the development of Mildred MacPherson Neighborhood Park. The ultimate configuration will include two travel lanes, bike lanes, parking along the eastern edge, and concrete curb and gutter on both sides. The space available for curbside parking along the eastern is wide enough to consider diagonal parking, to increase parking availability for the park; however, safety of traffic flow along Vulcan Avenue must be considered before such parking is provided.

2. Third Street
Improvements to Third Street shall be contained within the existing 80-foot right-of-way. The existing curb to curb width equals 51 feet. The existing curb and gutter and concrete sidewalk shall remain in place. The striping improvements should include two travel lanes, bike lanes, and parallel parking (Figure 7-f).

These standards largely keep in place the existing improvements on Third Street. The retention of bicycle lanes from "K" Street to "E" Street, and their extension from "B" Street to "E" Street, will ensure a "safe route to school" and complete this recreation bypass of First Street. The established pattern of sidewalks behind broad parkways is a significant element of neighborhood character; it is interrupted only where Third street crosses Cottonwood Creek (south of "B" Street) to minimize the impact on the Creek. On the east side of Third Street between "J" and "K", if the opportunity arises to relocate sidewalk behind a parkway per these standards, it shall be required.

3. Fourth Street
Improvements to Fourth Street shall be contained within the existing 80-foot right-of-way. The existing roadway width equals 51 feet. The improvements should include two travel lanes, parallel parking, bike lanes, and concrete curb and gutter (Figure 7-g).

Improvements per these standards already exist and shall be retained between "C" and "E" streets. From "H" to "F" Street, past street closings have narrowed the right-of-way intermittently, and sidewalks, when built, have been placed directly behind the curb, with no parkway. Bicycle lanes on Fourth Street, between "F" and "H" streets, may be sacrificed, but future development and redevelopment shall maintain a minimum of 70 feet of right-of-way and provide parkway and sidewalk per these standards.

B. Eastern Residential Area

The street improvement standards established for the Residential East subdistrict are unique among the standards of this specific plan, reflecting the unique identity of this neighborhood. The residential portion of this neighborhood is, in certain aspects of character, a westerly extension of the Encinitas Highlands neighborhood to the east. As such, the intent of these standards is to maintain much the same informal, "semi-rural" character of the internal streets of this neighborhood, characterized by minimal and informal street improvements. Specified streets called out below provide key connections as part of a "safe routes" network, and are designed to formal pedestrian and bicycle facilities. Otherwise, neighborhood street standards are minimized.

1. East "F" Street

East "F" Street provides vehicular and pedestrian access to Vulcan Avenue/downtown via Requeza Street from points east. For this reason, it is important to provide formal pedestrian and bicycle facilities. On-street parking, however, may be eliminated, as a narrower street section will allow driveway parking for adjacent properties to be retained. The improvements shall include two travel lanes, bicycle lanes, concrete rolled curb, and concrete sidewalk, on the north side (Figure 7-p).

5.4 Bicycle Facilities

The development of bikeway systems within the plan area is consistent with facilities outlined in the Circulation Element of the City of Encinitas General Plan, and the Master Bikeway Plan (MBP) and Engineering Feasibility Study for the City of Encinitas, November 1990.

The MBP states that approximately 80 percent of all bicycle trips are for exercise purposes and that most cyclists use a bicycle at least two days per week. A wide variety of types of bicycles are used, including racing types, "mountain" bikes, BMX types and beach cruisers. Problems reported range from glass and debris to poor lane markings and inadequate space. Not unexpectedly, most bicyclists surveyed would prefer separated bicycle paths or lanes, and quiet streets for travel.

The existing bikeway system within and around the plan area consists of a combination of Class I bike paths, Class II bike lanes and Class III shared bike routes. The predominantly used bike route with the plan area is First Street.

In response to the statistical data previously mentioned, the following recommendations are made:

• The existing Class I bike path located on First Street south of "K" Street is to remain.

• Provide a Class III bike route on First Street from "C" Street to "K" Street, on "D" Street eastward to Cornish Drive, on Cornish Drive southward to Requeza Street, and on Second Street from "D" Street south.

• Provide Class II bike lanes along Vulcan Avenue, Encinitas Boulevard/"B" Street, Santa Fe Drive, Third Street, Fourth Street, from "C" Street to "E" Street, "E" Street from Fourth Street to Third Street, and "K" Street from Third Street to First Street.

Each of the above recommendations is consistent with the proposals outlined by the MBP and the policies identified in the Circulation Element of the City of Encinitas General Plan.

6.0 Public Facilities/Services and Infrastructure

6.1 Summary

Perhaps the greatest challenge for public services and facilities is providing funding for needed improvements. Beyond the capital facilities noted above, substantial capital costs will be involved in needed street, alley, pedestrian sidewalk/path, bicycle facilities, and streetscape improvements. The specific plan provides preliminary cost estimates for all capital improvements and surveys all potential funding sources to enable subsequent detailed capital facility programming to choose and carry out the best options, as discussed in Section 11.1.

10.3 Circulation
Goal 1: Encinitas should have a transportation system that is safe, convenient and efficient and sensitive to and compatible with surrounding community character. (Coastal Act/30252)

Policy 1.15: The City will actively support an integrated transportation program that encourages and provides for mass transit, bicycle transportation, pedestrians, equestrians, and car-pooling. (Coastal Act/30252)

Policy 1.17: Standards shall be established and implemented to provide for adequate levels of street lighting, based on criteria of safety and related to volumes of vehicular, pedestrian and bicycle activity and potential points of conflict. Such standards shall be designed to respect different community and neighborhood needs for lighting, different community standards for design and special attention given to preservation of dark sky.

Goal 2: The City will make every effort to develop a varied transportation system that is capable of serving both the existing population and future residents while preserving community values and character. (Coastal Act/30252/30253)

Proposal: Streetscape and street improvements outlined in Section 4.7 and in Chapter 5.0, respectively, will reduce congestion, provide increased on-street parking, improve bicycle facilities, and create a safe pedestrian environment. In addition, specific street standards are proposed for the plan area streets which are more reflective of the neighborhood characteristics.

Goal 3: The City of Encinitas will promote the use of other modes of transport to reduce the dependence on the personal automobile. (Coastal Act/30252)

Policy 3.4: Cooperate with San Diego County, SANDAG and other jurisdictions to help plan and implement a regional multi-modal transportation system that is accessible to residents of the City. (Coastal Act/30252)

Policy 3.6: The City should provide and encourage efficient links between possible rail transit service and other transportation modes, including rerouting of bus service to interface with transit stops.

Policy 3.11: The City will strive to implement a safe, direct and convenient circulation system for commuting and recreational bicycle traffic. The City will support the development of additional bicycle facilities in the Coastal Zone, including the following:

• All Circulation Element roads will include provisions for bicycle lanes unless precluded by design and safety considerations in which cases, alternative routes shall be provided to form a continuous network.

• The provision of secure bicycle storage facilities at all beaches designated for high and moderate levels of use; and

• The installation of bicycle and surfboard racks on all buses serving the Coastal Zone. (Coastal Act/30252)

Proposal: Streetscape and street improvements outlined in Section 4.7 and in Chapter 5.0, respectively, will improve bicycle facilities and create a safer pedestrian environment. A proposed transit center which will feature a commuter rail station and bus interface also is planned for the downtown area, however, this project is not a part of the specific plan process. The specific plan anticipates the transit center and the streetscape concept plan provides coordination between concept plans for the transit center and proposed specific plan area streetscape plans.

Goal 4: The City should make every effort to develop a circulation system that highlights the environmental and scenic amenities of the area. (Coastal Act/30252)

Policy 4.4: Where possible, establish a separate system of hiking trails, bicycle paths and equestrian trails from which motorized vehicles shall be banned.

Policy 4.14: Where feasible, minimize the dependence on private motor vehicles. (Coastal Act/30252)

Proposal: As mention above, if feasible, every effort should be made to develop a multi-purpose trail along the railroad right-of-way.

Streetscape and street improvements outlined in Section 4.7 and in Chapter 5.0, respectively, will reduce congestion, provide increased on-street parking, improve bicycle facilities, and create a safer pedestrian environment. In addition, specific street standards are proposed for plan area streets, which are more reflective of the neighborhood characteristics.

First Street, Encinitas Boulevard, and Vulcan Avenue have been identified as streets within the specific plan area that require the undergrounding of utilities (see Chapter 11.0).

The proposed mixed use development in the specific plan area will provide more opportunities for live/work situations to occur, as well as residential uses which are closer to the commercial and office professional uses. This may help reduce dependence on the private motor vehicle.

11.0 Implementation

11.2 Financing Strategies
Surface Transportation Program (STP) Funds
The passage of the Intermodal Surface Transportation Efficiency Act of 1991 provided $155 billion over six years to strengthen the national transportation system with approximately $3 billion of the funds to be used for “enhancement” projects. Transportation enhancement activities include: pedestrian and bicycle facilities, acquisition of scenic and historic sites, scenic and historic highway programs, landscaping, rehabilitation of historic transportation facilities, preservation of abandoned transportation corridors, archeological planning and research, control and removal of outdoor advertising, and mitigation of water quality impacts from roadway runoff. Funding can be obtained through San Diego Association of Governments (SANDAG) on a regional basis and also directly through the State.

2.5 Recreational Trails Master Plan • 2002

The City’s General Plan was adopted in 1989 and contains goals, policies and programs to guide development. In the Recreation Element of the General Plan a generalized trail system was provided as part of the Recreation Facilities Plan (Figure 4, Recreation Element of the General Plan). The Recreation Facilities Plan identified generalized routes for hiking, bicycling and pedestrian recreation as well as general standards for the trail system. However, the trails were not fully articulated due to the general nature of the document. In August of 1997, the City, recognizing the need to take the planning process one step further, began formulation of a more detailed plan for trails using the General Plan as a starting point.

The following goals and policies set forth by the Circulation and Recreation Elements of the General Plan have been further developed in this Recreational Trails Master Plan:

Circulation Element
Policy 4.4: Where possible, establish a separate system of hiking trails, bicycle paths and equestrian trails from which motorized vehicles shall be banned.

Recreation Element
Policy 1.16: Future trails in addition to those planned for in this element may be added to the existing system to enhance the recreational opportunities of the City.

Policy 2.2: Provide and maintain an inter-linking network of trails for horseback riding, hiking, and bicycling; minimizing the cost of the trail system by encouraging the use of drainage channels, flood plains, existing trails, public lands, excess street rights-of-way, and major utility rights-of-way.

The generalized trails defined in the Recreation Facilities Plan were analyzed as a first step in the planning process, followed by a comprehensive field analysis to identify new trail segments which could fill gaps that existed in the original plan and to expand and enrich the recreational opportunities of the trail system. This analysis also included trails requested for inclusion by members of the community.

The Recreational Trails Master Plan provides a comprehensive long-range planning document that provides flexibility. Trail alignments and standards have been developed based on current information and known future conditions with the idea that as circumstances change, the plan can accommodate changing conditions and still remain effective. For instance, trail alignments on private parcels that have no current development plans have been designated based on existing topography and alignment of proposed streets. When development occurs in these areas, the City will work closely with the developer to adjust the alignment based on the proposed plans in order to maintain community character, meet the needs of the City's recreational users, avoid or minimize environmental impacts, and maintain the viability of the development project.

Unique Opportunity
The City of Encinitas has many unique aspects which enable the development of an exceptional trail system including:

• Over 10 miles of existing City-maintained trails;

• Approximately 5 miles of existing trails in the San Elijo Lagoon managed by the County of San Diego;

• Over 17 miles of easements dedicated for trails that are pending implementation;

• Numerous city parks, schools, beaches, and lagoons which provide natural destination points, staging areas and rest areas;

• Adjacency to a well developed trail system in Rancho Santa Fe, which provides recreational opportunities and linkages to regional connections; and,

• A dedicated, well informed and highly organized group of trail activists who are willing to devote their time and economic resources to preserving and enhancing current trails, and to developing and maintaining new trail opportunities.

2.5.1 Relationship to the Recreational Trails Master Plan

The Recreational Trails Master Plan (RTMP) and the Bikeway Master Plan (BMP) are intended not only to be consistent, but also complementary with each other by reinforcing the goals, policies and intent of the General Plan. Where the BMP provides for an "on-street" transportation system, the RTMP provides for an "off-street" transportation system. Though functionally similar, the difference is that the RTMP relies upon local standards rather than the Streets and Highways Code. Moreover, while the RTMP is recreational in orientation, the BMP's focus is to provide a safe, convenient and efficient transportation system and an alternative to driving a motor vehicle.

2.6 Master Bikeway Plan and Engineering Feasibility Study for the City of Encinitas • 1990

This plan dates to 1990, presumably prior to the availability of GIS or any other digital mapping. There is no known date concerning the City's existing bikeway facilities. Therefore, the existence of such facilities required field verification.

The document maps numerous "recommended bikeways," including eight Class 1 bike path segments, 26 Class 2 bike lane segments and six Class 3 bike route segments.

According to the plan: "The existing bikeway system in Encinitas was inherited from San Diego County when the City was incorporated in 1986. It consists primarily of:

• Striped and posted bike lanes along Encinitas Boulevard and El Camino Real within City boundaries;

• A shoulder bike lane (substandard by today's standards in parts) along La Costa;

• A striped and posted bike lane from Second and J Streets via J, Third, E and Fourth Streets to Moonlight (Beach) State Park;

• A short segment of striped and posted bike lane along Santa Fe Avenue from EL Camino Real to Wotan Drive; and

• A discontinuous combination of bike lanes and roadside bike paths along Old Route 101 (First Street/Pacific Coast Highway) from Solana Beach north to the Carlsbad city limits.

In addition to these designated bikeways, in the General Plan are proposed bikeways (illustrated in Figure 15) along Manchester Avenue/Rancho Santa Fe Road, Olivenhain Road, Vulcan Avenue, Leucadia Boulevard, Santa Fe Avenue, Balour Avenue, Birmingham Drive/Lake Drive, and the Garden View Road/Willowspring Drive/Glen Arbor Drive, Cerro Street, Westlake Street, and Requeza Street/Nardo Road. These proposals will be reviewed for feasibility and appropriate timing."

2.7 Neighborhood Traffic Management Program

This is a draft document recommended for approval to the City Council by the Traffic Commission in April, 2004 and scheduled for review by the Council in late 2004. However, policies noted are consistent with various City planning policies and documents.

Mission Statement: Develop and oversee a program that will encourage vehicles to use Circulation Element streets; reduce impact of vehicular traffic in neighborhoods; and improve pedestrian, bicyclist and equestrian safety within and around the City of Encinitas.

1.0 Introduction

Safe, pleasant residential streets that allow Encinitas residents to walk, bicycle, and socialize have been a City priority for many years.

2.4 Street Types
Streets and sidewalks provide a network of routes that allow access to destinations via foot, bicycle, or motorized vehicles. The Neighborhood Traffic Management Program was developed to address neighborhood streets that primarily serve residential areas.

Collector Streets
Collector streets provide connections between arterial streets and residential streets. Wide collector streets can create a barrier to pedestrian and bicycle movements across a neighborhood.

2.6 Bikeways
Bicyclists' needs and concerns are important and must be considered during the development of neighborhood traffic plans. Two types of bikeway facilities that should be considered when preparing Neighborhood Traffic Management plans are described below.

Bike Paths (Multi-Use Trails)
Paths and trails that are separated from streets can provide a quiet, comfortable bicycling and walking environment. Multi-use trails add value to adjacent properties and can often provide short-cuts that link together areas that are less accessible to motorized vehicles. Trails are problematic when they parallel streets in areas with many driveways and cross streets because there is a potential conflict at each driveway and intersection. For this reason, multi-use trails are best when located in corridors away from streets. On-street bicycle facilities may be more practical when routes are adjacent to a street.

Bike Lanes
Bike lanes consist of two stripes that define the space on the street for riding bicycles. The stripe can narrow the travel lanes and give the overall street a more narrow appearance. They provide many other benefits to bicyclists and pedestrians, but because they do not deflect the vehicle travel path their impact on speeds may not be significant.

Bike lanes designate travel space for bicyclists, which increases rider comfort and the predictability of bicyclist movements. This added travel space also makes it feasible for motorists to encroach into the space designated for bicyclists and travel faster through or around traffic calming treatments. Limiting bike lanes to streets with more than 1,500 vehicles per day prevents this adverse impact in residential areas.

2.8 City of Carlsbad Bikeway Master Plan • 2001

The City of Carlsbad Bikeway Master Plan was completed in 2001 by KTU+A. It lists four Class 2 bike lane facilities connecting the City of Encinitas and the City of Carlsbad. They are Highway 101, La Costa Avenue, El Camino Real and Olivenhain Road/Leucadia Boulevard. One other Class 2 bike lane facility was proposed for Rancho Santa Fe Road.

A proposed Class 1 bike path connection is the planned Coastal Rail Trail.

2.9 City of San Marcos Bikeway Master Plan • 2001

The City of San Marcos is located just outside the northern limits of Encinitas' Sphere of Influence. The city adopted a bikeway master plan in 2001. There are no paved roadway connections between the two cities primarily due to topographic conditions and the area's rural character.

2.10 City of Solana Beach Bikeway Master Plan • 1993

The City of Solana Beach adopted a bikeway master plan in 1993 and an addendum was completed in 1996.

The City of Encinitas shares a significant length of city limit with the City of Solana Beach to the south, but the intervening San Elijo Lagoon limits connections other than the existing Class 2 bike lane facility on Highway 101.

A proposed Class 1 bike path connection is the planned Coastal Rail Trail.

2.11 County of San Diego Bikeway Master Plan • 2004

No bikeway facilities currently exist between the unincorporated areas of the County of San Diego and the City of Encinitas.

Class 2 bike lanes are proposed for a very short segment of Rancho Santa Fe Road from the city limit to La Bajada within the unincorporated County. This segment is coded as “high priority.” The only other proposed segment that connects with the City of Encinitas is a Class 3 bike route on El Camino del Norte from the city limits to Paseo Delicias that becomes Del Dios Highway. This segment is coded as “other priority.”

One other proposed bikeway facility is worth noting because, even though it falls wholly within the County’s unincorporated area, it would pass very close to the City of Encinitas city limits. This is a proposed Class 3 bike route on El Camino Real and La Noria from Via del la Valle to La Bajada. This segment is coded as “other priority.”

2.12 San Diego Association of Governments (SANDAG) San Diego Region Bike Map • 2002

The most comprehensive portrayal of current bicycle facilities within Encinitas is probably the SANDAG San Diego Region Bike Map, dated 2002. However, field verification of the revealed that none of the Class 1 facilities shown on the SANDAG map actually meet Caltrans Class 1 standards. They were generally too narrow and did not provide sufficient horizontal clearance from adjacent roadways or obstacles. (See Chapter 1: Introduction.) The map shows the following facilities:

Trails (Shown as Class 1)
• Segment adjacent to a large portion of Quail Gardens Drive, located north of Encinitas Boulevard and passing northbound through Leucadia Boulevard.

• Segment adjacent to Leucadia Boulevard between Quail Gardens Drive and Garden View Road.

• Segment just north of a short section of Encinitas Boulevard west of Highway 101.

• Several discontinuous segments along Highway 101 between roughly El Portal Street and near the mouth of the San Elijo Lagoon. This segment south of K Street is undergoing evaluation by KTU+A under a City of Encinitas contract to determine how best to accommodate bicycle and pedestrian traffic on this highly popular coastal route.

Class 2 (bike lanes)
• Facility on the entire length of La Costa Avenue within the city limits.

• Facility on the entire length of Leucadia Boulevard within the city limits.

• Facility on the entire length of Encinitas Boulevard within the city limits.

• Facility on the entire length of El Camino Real except for an undesignated segment between Tennis Club Drive and Manchester Avenue.

• Facility on Manchester Avenue between Interstate 5 and El Camino Real.

• Facility segments on Santa Fe Drive, between Vulcan Avenue and Interstate 5 and between Lake Drive and El Camino Real.

• In the downtown area, Facility segments on West K Street connecting with 3rd Street north to Encinitas Boulevard, as well as a loop formed by facilities on E Street, 4th Street and C Street.

• Facility on Via Cantebria from Encinitas Boulevard to Leo Mullens Sports Park.

• Facility on Garden View Road between Leucadia Boulevard and El Camino Real.

Class 3 (bike routes)
• One bike route on Highway 101 from La Costa Avenue to C Street. This segment is questionable because of difficulties in determining intended color coding due to map overprinting at such a small scale. This will be field verified.

Other Suggested Routes
Several segments are coded on the SANDAG map under the category of "Other Suggested Routes." These segments occur primarily on otherwise undesignated segments of El Camino Real, Highway 101, Manchester Avenue and Rancho Santa Fe Road.

2.13 San Diego County Bicycle Use and Attitude Survey • 1994

3,800 telephone interviews were conducted in early 1994 and the survey results published in May, 1994. Areas of interest were:
• San Diego residents' current bicycle ownership,
• Frequency of bicycle and bicycle safety equipment usage,
• Types of bicycling activities,
• Bicycle organization membership,
• Bicycle accident experience,
• Reasons for not bicycling to work,
• Preferred types of bikeways,
• Attitudes about enforcing traffic laws among bicyclists,
• Awareness of and attitudes about helmet laws,
• Awareness of existing bicycling programs and services,
• Preferred bicycle facility improvements,
• Support of various facility improvement financing tools, and
• Standard demographic profile.

Conclusions concerning specific municipalities are limited, but the overall survey findings are informative. For example, the primary reason for not riding a bicycle to work was that the work location was "too far/distance is too great" (81 percent).

Though most respondents were satisfied with bikeway maintenance, the top reason for dissatisfaction was "bikeways are dirty/littered."

The primary complaints about motorists were “motorists need to be more aware,” “motorists do not stay in their portion of road” and “motorists cut cyclists off at intersections.” The primary complaints about cyclists were “bicyclists don’t obey traffic laws” and “bicycles do not stay in their lane.”

Less than six percent of cyclist respondents reported having an injury accident in the past year and more than half of those said no others were involved in the most serious of their reported accidents. When others were involved, the most common other participant was a motor vehicle. The top two accident locations were “street intersection” and “bike lane.”

Of six choices, only two bicycle facility improvements (“build more bike paths” and “build more bike lanes’) were desired by more than half of the respondents. Among those who cycled the least, the most preferred bikeway type by a wide margin was Class 1 bicycle paths. Frequent cyclists also preferred Class 1 facilities, but their preference was not as strong. Many also preferred Class 2 lanes.

Encinitas respondents reported one of the highest rates of bus bike rack use and the highest interest in building more bicycle paths. Encinitas motorists were the most like likely to state that “bicyclists do not stay in their lane,” yet they also most strongly disagreed that “most bike/car accidents are the fault of the bicyclist.”

These survey results are now ten years old and should be regarded with that in mind.

2.14 CEQA/Negative Declaration

As required by the California Environmental Quality Act (CEQA), the City of Encinitas completed an Environmental Initial Assessment (EIA) to determine whether the Bikeway Master Plan would have a significant effect on the environment. It was determined from the EIA that the project would not have a significant effect on the environment and a Negative Declaration was prepared.

The Negative Declaration was circulated for public review period from October 7, 2004 through October 28, 2004. The Negative Declaration found that although the project could have significant effects on the environment related to geological problems, water, biological resources, cultural resources and mandatory findings of significance, there would not be a significant effect in this case because of the impact controls consistent with the City’s adopted development regulations and processes incorporated into the project.

The Negative Declaration was adopted by the City Council with the adoption of the Bikeway Master Plan. The Negative Declaration is on file with the City of Encinitas Planning and Building Department.

3

Trip Origin and Destination Points

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, some unique to Encinitas such as beach access points. Other trip origin and destination points included the city hall, school district offices, hospitals, park and ride lots, sheriff's stations, train stations, transportation centers, beach access points, parks, community or visitors center and libraries. (See Figure 3-9: Trip Origin and Destination Points.)

3.1 Trip Origins

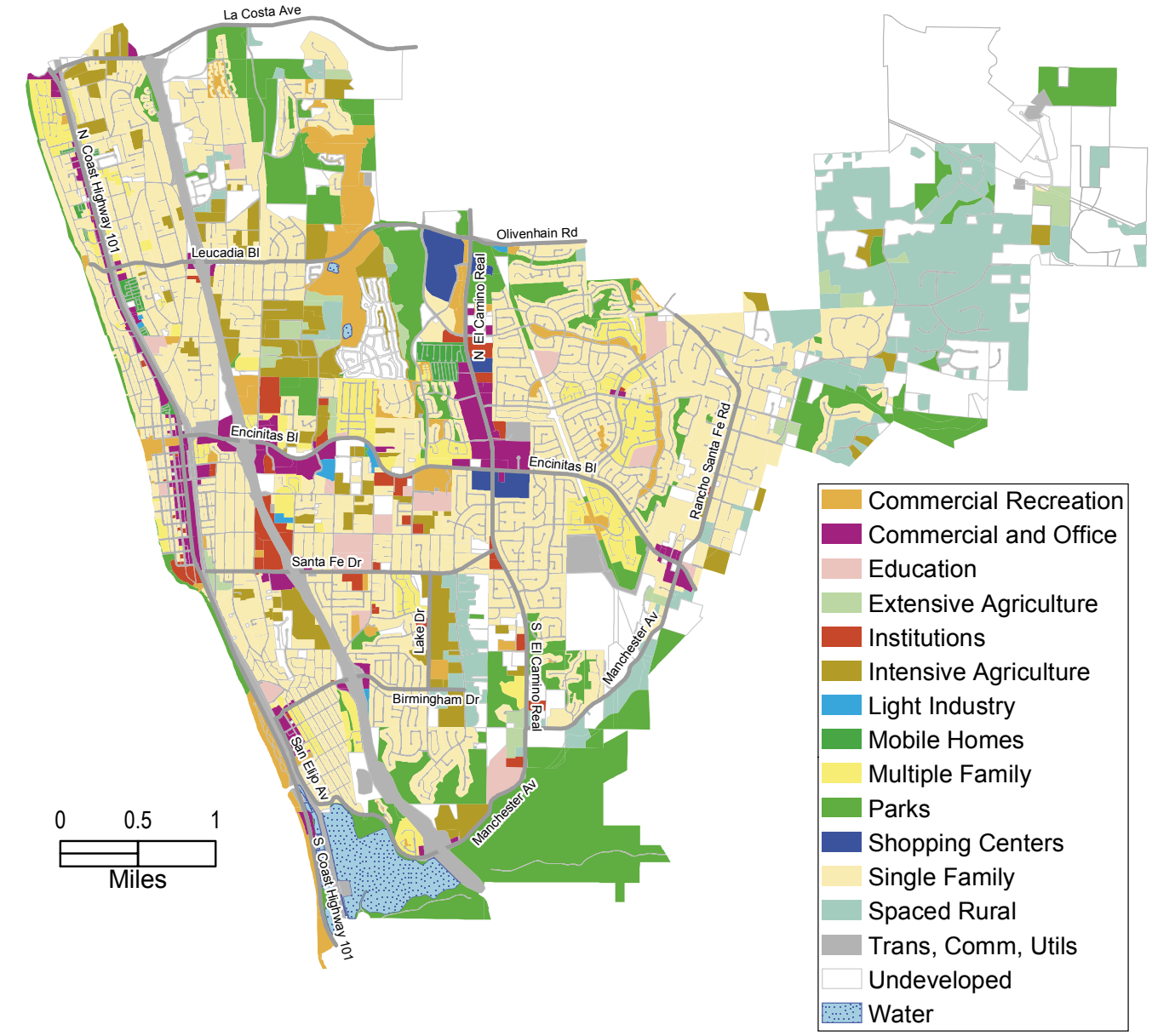
In the context of a bikeway master plan analysis, "trip origins" are defined as those areas or specific locations from which the majority of bicycle usage is likely to come. Determining where these trip origins are now or will be in the future is important in guiding the design and implementation of a cost-effective bikeway facility system that will maintain its usefulness over time. This includes tracking projected changes in land use, population and housing density, but defining the trip origins for a particular city is usually not so straightforward.

Extracting useful information from some of the data described in the following sections sometimes required evaluating data from other sources and synthesizing the results. Other sources of information were reviewed based on well known principles employed in most bikeway master plan projects. For instance, residential areas are, in general, trip origin points. In all cases, the primary information sought was how and where changes are projected to occur in Encinitas in the near future.

In terms of bikeway facility planning, significant concentrations of housing or employment can better support the costs of bicycle facilities because potential users are clustered. Higher housing or employment densities tend to be the most cost-effective situations for bicycle facilities because they provide the most potential users for a given area.

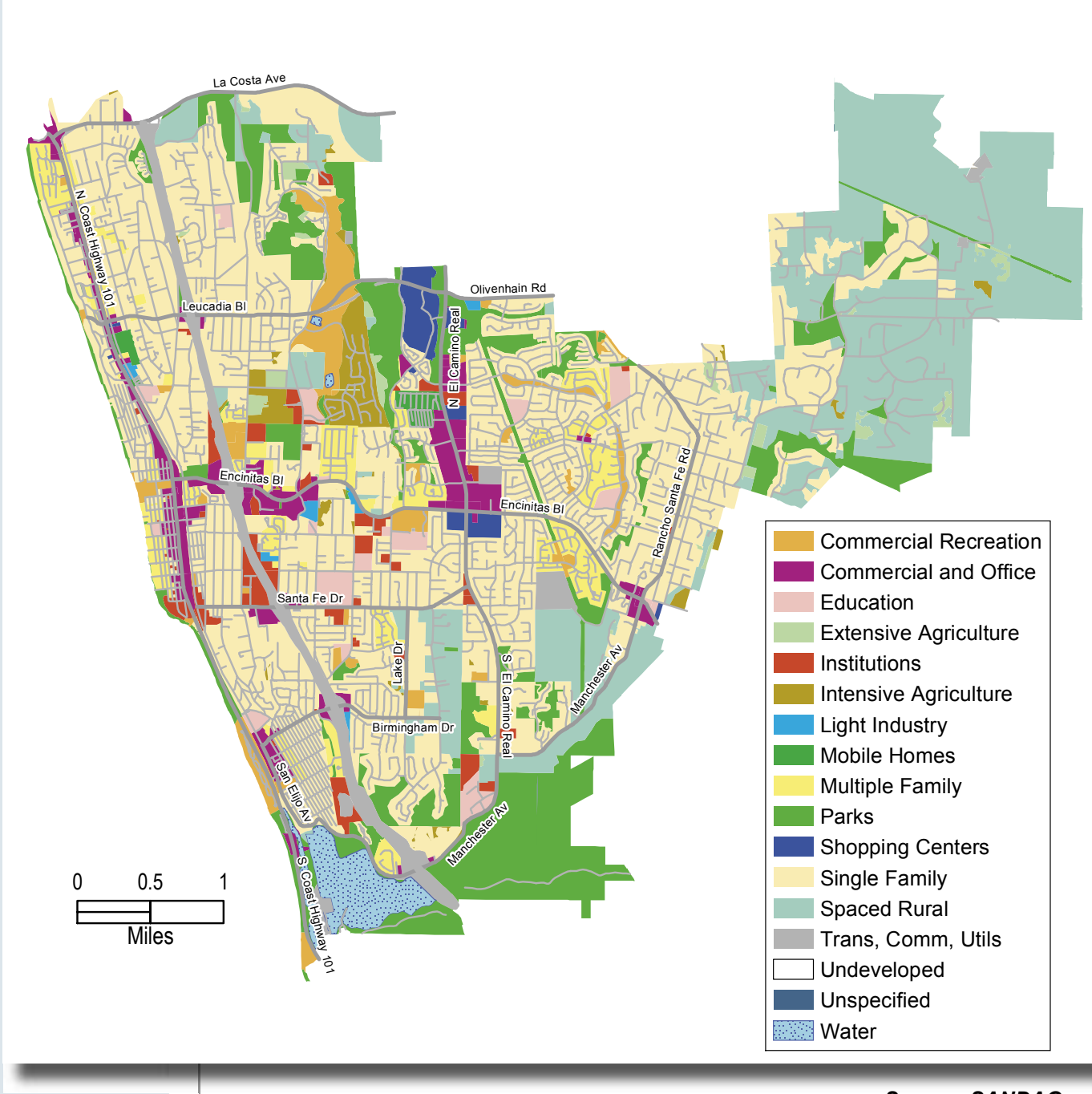
Most of the population statistics used to perform this trip origin analysis were derived from regional demographic data obtained from the U.S. Census Bureau. SANDAG provided much of the land use data needed to produce the maps for this chapter, including the most recent 2030 projections. Data developed from remotely sensed imagery and aerial photography was also used in the analysis. These data sources were used primarily

Figure 3-1: 2002 Land Use



Source: SANDAG

Figure 3-2: 2030 Land Use



Source: SANDAG

for defining and evaluating existing and proposed housing and employment densities and trends, land use trend analysis, and, from these, determining potential trip origins.

3.1.1 Existing Land Use

Existing land use patterns in Encinitas are defined, for the most part, by a fairly conventional urban street pattern of primarily low and moderate density residential development interspersed with pockets of many other land uses such as public services and industrial. The concentrations of commercial, office and moderate density residential land use occur primarily along the major thoroughfares, such El Camino Real, Encinitas Boulevard and Coast Highway 101. (See Figure 3-1: 2002 Land Use.)

3.1.2 Future Land Use

Comparison of the 2002 and projected 2030 land uses reveals only moderate changes. One noticeable change in the year 2030 data is the fate of land currently designated as agriculture and vacant/undeveloped. These two land uses will have been almost completely replaced, primarily by single family and spaced rural residential. This is a trend common to cities throughout coastal southern California. (See Figure 3-2: 2030 Land Use.)

The land use changes noted above also indicate a trend toward more concentrated development, in general, and more housing, in particular, in the eastern portion of the City. This will tend to create new demands for bicycle facilities where less concentrated land uses had existed before. Overall, housing and employment will continue to be dispersed across Encinitas as they are now, retaining commercial concentrations along major thoroughfares, but land use changes are not expected to be significant, other than some moderate density residential area expansion along major thoroughfares.

3.1.3 Existing Residential Areas

Residential land uses are by far the most common origin points for bicycle trips within a community, followed by bicycle trips originating in the residential areas of adjacent communities. Analyzing census housing density data is the primary method to determine what areas of a city will be most likely to generate bicycle trips. Logically, the higher the housing density, the more bicycle trips will be generated.

The bicycling trips originating in residential areas typically terminate at schools and employment centers, retail and entertainment centers, parks and open space, as well as at other residential areas. For this reason, the sizes, densities and locations of residential developments and their relationships to other land uses such as schools, employment centers and parks and open space are crucially important to bikeway facility planning.

Typical residential area along Third Street

Most bicycle trips are likely to be for transportation (commuting to work or school), recreation and exercise purposes. These categories were very evenly distributed in questionnaire results. All use categories are likely to occur throughout the City, but recreational riding may occur more in the coastal portion of Encinitas, Riding for exercise is also likely to occur along the coastal strip, but it can occur throughout the City wherever streets are wider and have fewer cross streets and curb cuts. Commuter riding may occur anywhere, but commuters are more likely to be seen on the more direct routes utilizing major streets and arterials.

3.1.3.1 Existing Population and Housing Density

Based on the proposed land use, the City of Encinitas will be built out within two decades. Population density and housing density are not precisely the same characteristic, but they generally correlate with each other. Both the highest population and housing densities occur in “downtown” Encinitas, near the city “center” in the west central portion of the City and in

Encinitas City Hall

Downtown Encinitas (Coast Hwy 101 at D Street)

Cardiff Post Office

several other distinct areas such as Cardiff and a large area just east of North El Camino Real just south of Olivenhain Road. (See Figure 3-3: 2002 Population Density and Figure 3-5: 2002 Housing Density.)

3.1.3.2 Future Population and Housing Density

Population and housing densities in Encinitas exhibit the expected trend of moderate increases in the year 2030 data compared to 2002. The areas of highest density display a trend to outward expansion while remaining essentially contiguous, with the largest change occurring in the central portion of the city area directly abutting North El Camino Real between Leucadia Boulevard and Santa Fe Road. This will become a substantial area of high density residential development. (See Figure 3-4: 2030 Population Density and Figure 3-6: 2030 Housing Density.)

3.1.4 Trip Origin Summary

Based on the foregoing analysis of housing density, population density and land use, most future bicycle activity is likely to originate from within the residential areas. These areas are large enough in terms of population density and physical size to generate some bicycle traffic that originates and terminates within themselves, as well as supplying users for the city-wide bicycle system. Questionnaire results do not indicate that substantial numbers of commuting cyclists currently come from neighboring communities, though recreational and training riding often originates from outside the city, especially on Coast Highway 101.

Minor increases in employment densities are anticipated, especially along the North El Camino Real corridor. The number of commuting cyclists from neighboring communities, particularly Carlsbad, can also be expected to grow somewhat as well. The demand for bicycle facilities can be expected to grow with increases in employment density, especially for amenities favored by commuters such as secure bicycle parking, bike lockers and showers at their destination points.

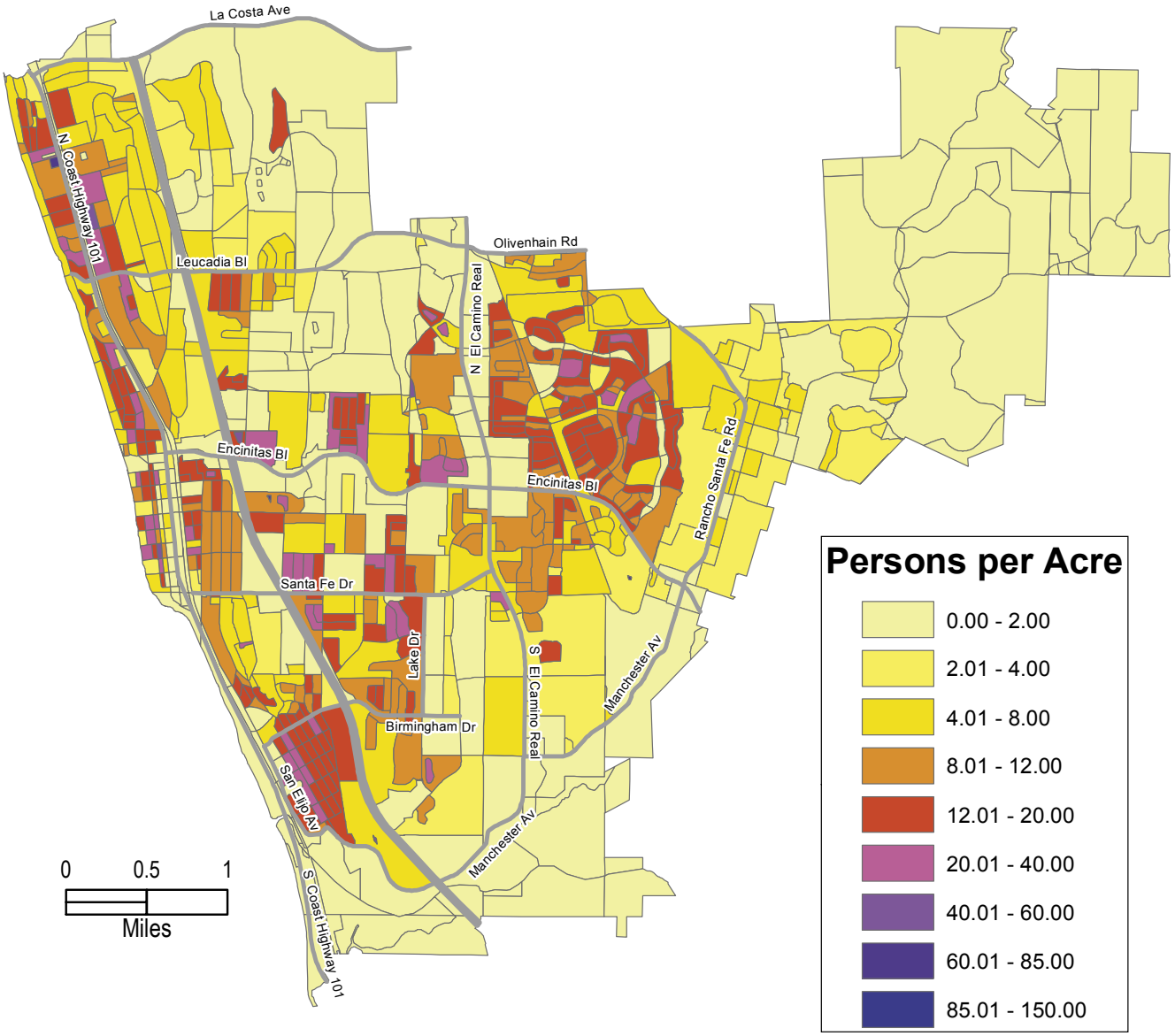
3.2 Destinations

Trip destination points in terms of bikeway facility planning are generally referred to as a community's "activity centers." In the context of a bicycle master plan analysis, the term "activity" specifically refers to bicycling usage generated as a result of the particular trip destination. A list of a community's activity centers can include its schools, parks, open spaces, athletic facilities, libraries, community centers, retail complexes and employment centers. The types and locations of these activity centers within a community reflect the amount and types of bicycle usage they can be expected to generate. This is especially true in terms of their proximity to residential areas.

3.2.1 Existing Activity Centers

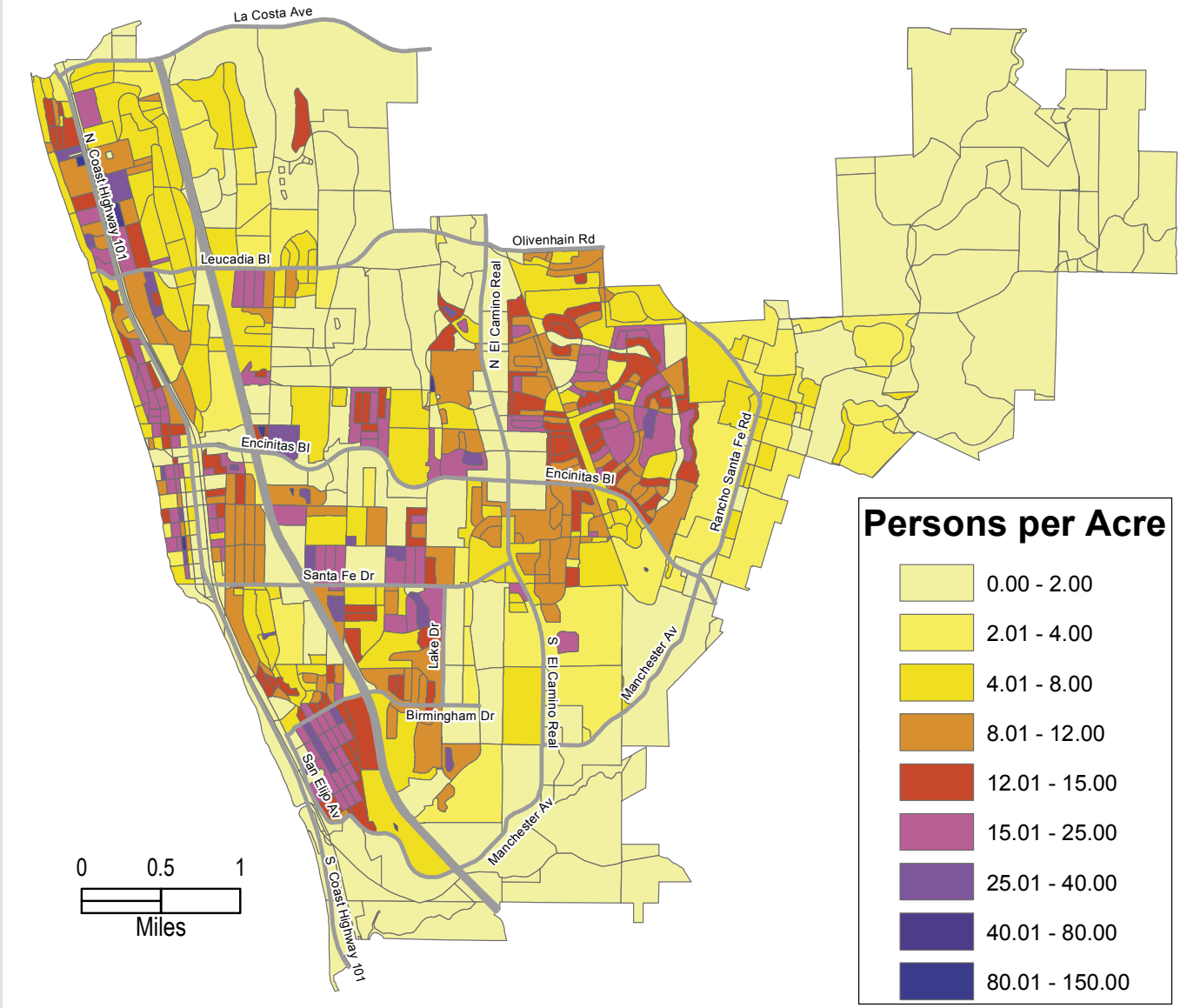
The SANDAG data defines activity centers as a community's major employers, office buildings, industrial sites, government sites, retail centers, hospitals, major attractions, colleges,

Figure 3-3: 2002 Population Density



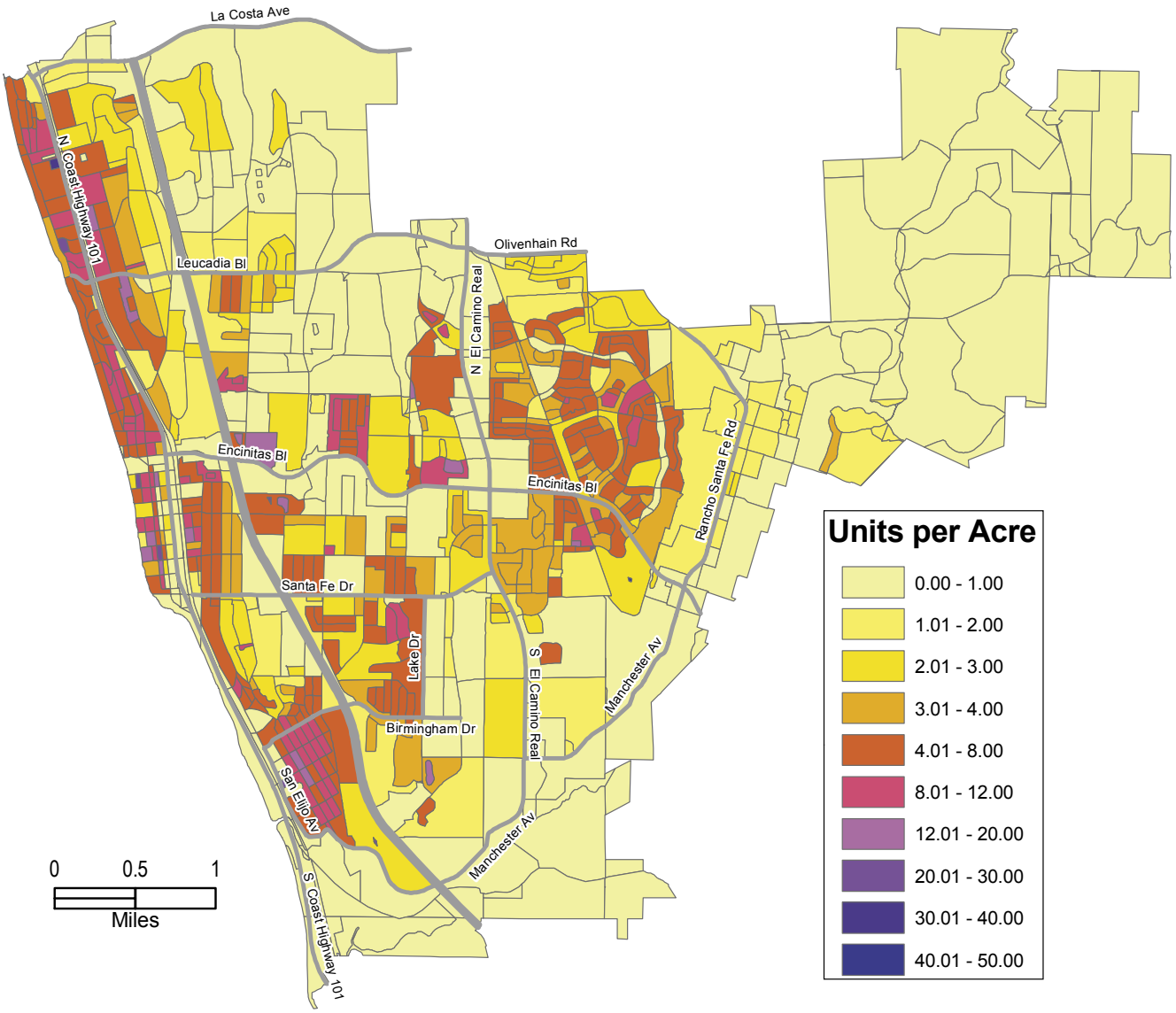
Source: SANDAG

Figure 3-4: 2030 Population Density



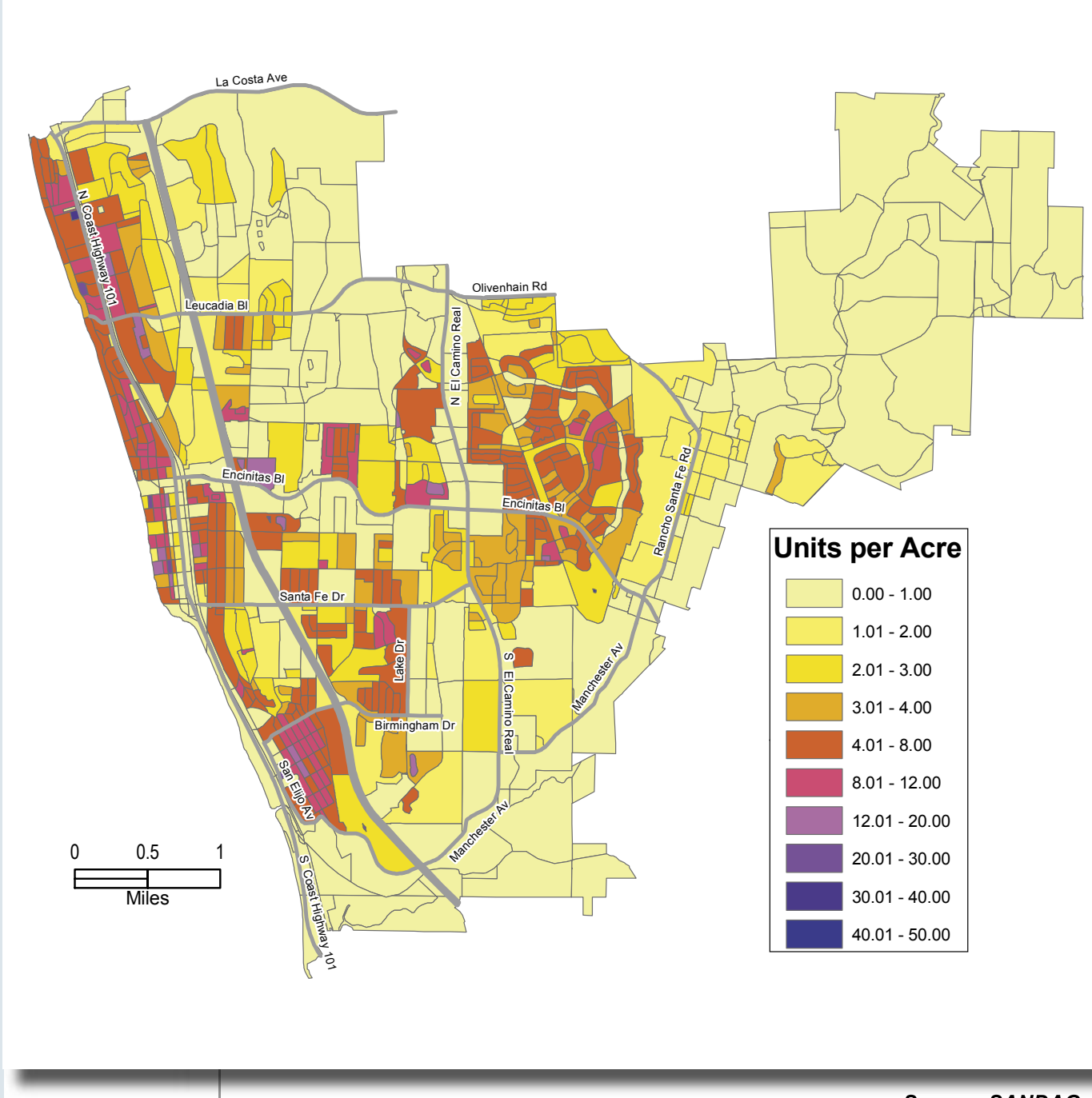
Source: SANDAG

Figure 3-5: 2002 Housing Density



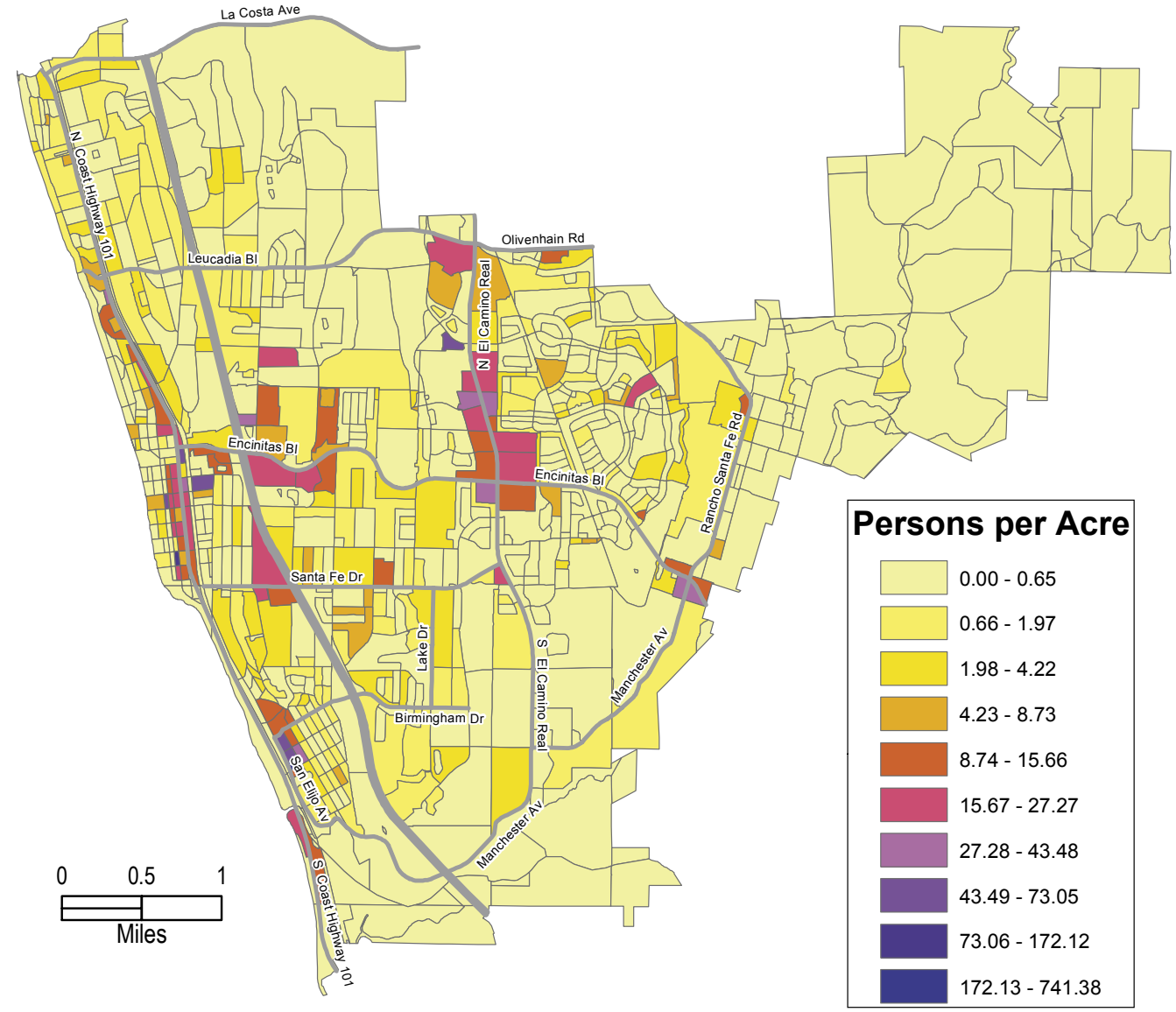
Source: SANDAG

Figure 3-6: 2030 Housing Density



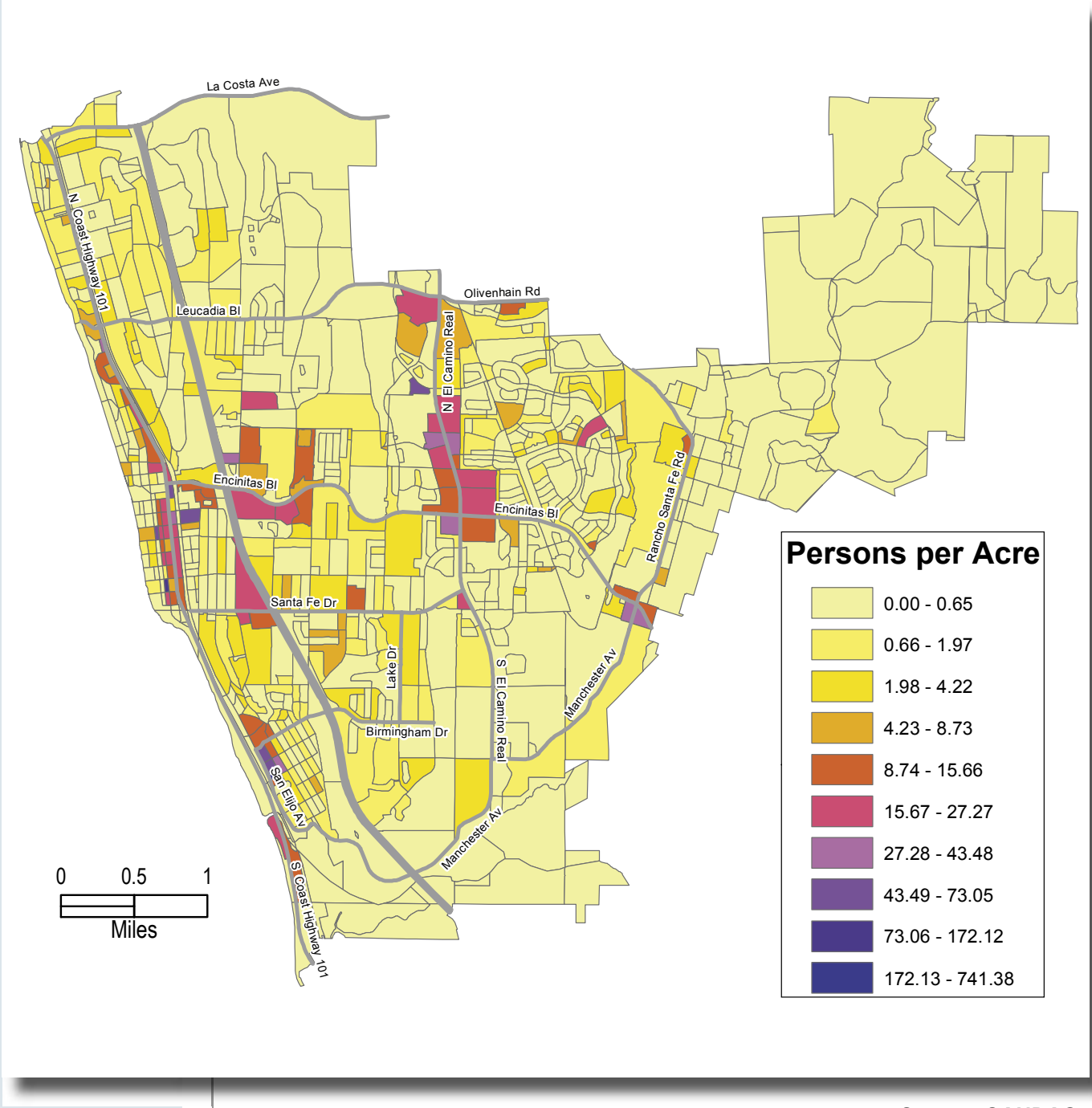
Source: SANDAG

Figure 3-7: 2002 Employment Density



Source: SANDAG

Figure 3-8: 2030 Employment Density



Source: SANDAG

universities, schools or parks and open space. The commercial and retail activity centers can also be regarded as employment centers because, in addition to the customers that constitute the typical activity center users, they also represent significant numbers of employees. Encinitas' major retail centers are represented in SANDAG's data within the highest employment density category. The civic activity centers include Encinitas' parks and schools, which are discussed in a following section.

Reviewing a map of existing employment density (See Figure 3-7) confirms that there is cluster of employers, office buildings and industrial sites in the area immediately around the main thoroughfares running through downtown Encinitas. Employment density is just as high in other areas of Encinitas, particularly North El Camino Real. These other areas have larger office buildings and major retail employers. Employment density is an indicator of bikeway facility demand in general, but more specifically, it is an indicator for shopping trips to areas with numerous businesses versus commuting trips to areas with major employers.

Overall, activity centers tend to be well served by bicycle facilities. Particularly east of Interstate 5, they lie well within an acceptable distance from their nearest adjacent bicycle facilities. This is due somewhat to the local topography that drove the pattern of development and roadways, primarily placing major roads and activity centers in valleys and secondarily on ridge lines. West of Interstate 5, the development pattern is a more traditional street grid on less hilly terrain that naturally provides multiple routes to any particular destination. The exception is the southern coastal area of Cardiff, which actually has the steepest roadway grades in the city.

Ocean Knoll Elementary School

Mira Costa Community College

Glen Park - Parks and playgrounds are destination points, especially for children and families

County of San Diego Library - Cardiff-by-the-Sea Branch Library

Figure 3-9: Trip Origin and Destination Points

These activity centers were plotted and evaluated to determine whether they fell on or near an existing or proposed bikeway. In some cases, proposed bikeways were extended or altered to provide a connection to a bicycle trip origin or destination point to make the system as functional and attractive to current and potential cyclists as possible.

3.2.2 Parks/Schools/Civic Centers

Considering the parks and schools independently of the other activity centers is intended to emphasize the more local, neighborhood and recreational functions of these centers. Like most communities, Encinitas' parks and athletic facilities are often associated with school sites. These centers are used by a much higher percentage of children than the other types of activity centers, which is an important factor in community-wide bikeway facility design. The location of schools, in particular, is a major factor in identifying safe bicycle routes because bicycling has traditionally been an important transportation mode for elementary and middle school age children. (See Figure 3-9: Trip Origin and Destination Points)

Analysis of the locations of Encinitas' schools indicates they are all adjacent to residential areas with quiet streets. However, Encinitas' schools are no different than any other city's schools in that many are close to at least one major street. Fortunately, the schools and the residential neighborhoods they serve tend to fall on the same side of the major streets. Therefore, the schools' primary bicycling access is likely to be from the surrounding residential streets that allow children access to their schools without having to ride on the busier streets and minimizes their having to cross them.

3.2.3 Employment Centers

Employment centers are concentrated along the major thoroughfares in central Encinitas where concentrations of commercial and office space occur. The coastal areas of Encinitas also have some employment centers, but smaller in scale. The 2030 proposed land use indicates a moderate increase in commercial development characterized by increases in employment density, but not in overall area. (See Figure 3-7: 2002 Employment Density and Figure 3-8: 2030 Employment Density.)

Swami's and D Street Viewpoint Day Use Park - Coastal destinations include parks and beach access points like these

Coast Highway 101 - A destination point for many cyclists

3.2.4 Trip Destination Summary

Schools and parks are the most common bicycling destinations, followed by commercial, retail and employment centers. This is likely to hold true in Encinitas as well. The schools will draw users from the immediate residential area of up to approximately a mile, which is the typical maximum distance that most children can be expected to want to ride. The major commercial centers such as downtown Encinitas and the areas along the major thoroughfares can also be expected to be popular destinations, and will typically draw users from farther away than the schools.

There are always special destinations that are characteristic of a particular community. In Encinitas these special destinations include the coastal portions of Encinitas where cycling is easier, making them desirable destinations for visitors as well as residents. Typically, the coastal strip has higher levels of bicycle use than any other part of the city, for recreational cycling. Because of its attractiveness for cycling of all types, the coastal portion of Encinitas should be considered a destination in itself. In addition, Coast Highway 101 is a well known route for competitive athletic training, especially for cyclists and triathletes, and could be considered a destination in itself.

There were few community workshop or questionnaire comments regarding specific trip origin and destination points. One comment reiterated field observations that Encinitas Ranch Town Center is a major destination for kids and teens, but has no convenient bicycle access and no way to safely bike from one store to another. The only other comment requested a connection between Mira Costa College and the Crest Drive area, but the sheer bluffs make this impossible.

4

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.

4.1 Multi-Modal Analysis

Existing transfer points such as commuter rail stations and bus stops were reviewed in relation to bikeway facilities to determine how well transit systems serve the purposes of multi-modal travel.

In general, local bus routes run on major thoroughfares that closely correspond with existing bicycle facilities, allowing cyclists to board at a preferred bus stop after putting their bicycle on the bus rack. The routes appear to serve the areas of highest employment density, which are generally situated along the major arterials. All buses are equipped with two-bike racks, which serve multi-modal travel at the most fundamental level. The existing routes do appear to serve the areas of highest employment density, which are generally situated along the major arterials. (See Figure 4-1: Transit Systems.)

Coaster Commuter Rail

4.2 North County Transit District (NCTD)

NCTD provides public transportation connections within and through Encinitas. The North County Transit District (NCTD) operates commute trains and buses that accommodate bicycles on or in their vehicles with restrictions under their specific descriptions to follow.

4.2.1 Coaster Commuter Rail

NCTD operates the Coaster commuter rail service with one stop in Encinitas, within the coastal strip in the westernmost portion of the City in downtown Encinitas. Coaster rail cars accommodate bicycles, but with a limit of four bicycles per car. Users must enter a train car through doors marked with a bicycle emblem and use one of the spaces provided in the lower level of each train car. The bike's front and back wheels must be secured using available fastening straps. No permit or additional charges are required, and the spaces are available on a first-come, first-serve basis.

Figure 4-1: Transit Systems

4.2.2 NCTD Buses

Besides the coastal strip served by the Coaster, buses provide mass transit services throughout the remainder of the City. All NCTD buses are equipped with bike racks. There is no permit or additional charge required, and they are available on a first-come, first-serve basis. An adult must accompany children 10 and younger and users must be able to load their own bike. However, bicycle loading and unloading is allowed only at designated bus stops with a bike graphic affixed to the bus stop sign.

NCTD Bus at Encinitas Station

4.3 Park and Ride Facilities

There are two park and ride lots in Encinitas, and though not within the city limits, there is also one other park and ride lot immediately north in Carlsbad. (See Figure 2: Transit Systems.) Note that none are equipped with bicycle lockers.

Park and Ride Lot 32

This lot is located just north of Encinitas' in Carlsbad and northeast of the intersection of La Costa Avenue and Interstate 5. According to SANDAG, services include an on-site attendant.

Park and Ride Lot 62

This lot is located in Encinitas just south of Encinitas Boulevard on Calle Magdalena at the San Dieguito United Methodist Church. According to SANDAG, services include bus service, shopping and fuel.

Park and Ride Lot 47

Park and Ride Lot 47

This lot is located in Encinitas at the northeast corner of the intersection of Birmingham Drive and Interstate 5. According to SANDAG, services include an on-site attendant and this is a "Charger's Shuttle" site.

4.4 Transit Centers

Encinitas has one transit center served by seven local bus routes: Encinitas Station in downtown coastal Encinitas. It is also a stop for the Coaster commuter rail. (See Figure 4-1: Transit Systems.)

There were few comments concerning multi-modal connections from either the community workshop respondents or the questionnaire comments. Users appear to be satisfied with the multi-modal linkages available, or simply do not use them and have therefore had no opinion about them.

5

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 literature 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.

Safety is first reviewed in the following sections through applicable literature, examination of user types and capabilities and analysis of bicycle/roadway compatibility. The second half of the chapter then addresses problem areas specific to Encinitas.

Coast Highway 101 - Guardrails and eucalyptus in close proximity to the traveled way

5.1 Literature Review

Several bikeway system design and safety references were reviewed for this portion of the study. A review of the titles and subtitles reveal that cyclists are not the exclusive users of all bicycle facilities, especially Class 1 type paths. These publications included comprehensive literature reviews, technical design criteria and case studies:

• *Bicycle Transportation - A Guide for Cycling Transportation Engineers*, Second Edition, John Forester

• *Guide for the Development of Bicycle Facilities*, American Association of State Highway and Transportation Officials (AASHTO)

• *Bicycle Blueprint - A Plan to Bring Bicycling into the Mainstream in New York City*, Transportation Alternatives

• *The National Bicycling and Walking Study - Transportation Choices for a Changing America*, U.S. Dept. of Transportation, Federal Highway Administration

• *Technical Handbook of Bikeway Design - Planning, Design, Implementation*, Second Edition, Velo Quebec, Ministere des Transports du Quebec

5.2 User Types and Capabilities

Users can be classified using a number of criteria such as their ages, their cycling experience and physical condition, for examples, to come up with a profile of the types of users expected to make use of a particular bikeway system. Such a user classification is very useful for bikeway planning purposes.

5.2.1 User Classification

The *American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities* defines a cyclist classification system to assist in the selection of appropriate facilities as follows:

• Group A - Advanced Bicyclists (Experienced): Group A bicyclists fall into two categories; commuting/utility and sports/touring.

• Group B - Basic Bicyclists (casual, novice, occasional, recreational)

• Group C - Children (preteen)

AASHTO estimates that only about five percent of the cycling population are experienced cyclists. Though there are no data to support this estimate, this is probably accurate enough for general use in the United States. (See Figure 5-1: Bikeway User Profiles.)

Bikeway facility use is not confined to cycling.

AASHTO states that, in most circumstances, Group B and Group C cyclists can be combined. However, Group C cyclists are much more likely to ride almost daily, and especially to ride bicycles to and from schools during mornings and afternoons most of the year. This would also include Group B teens. The majority of Group B adult cyclists are more likely to ride on weekends and some evenings during the summer since they are more likely to be riding for recreation rather than for commuting. More importantly, the groups also tend to ride on different types of streets. Group C cyclists tend to stay in residential areas, while Group B cyclists will tend to ride on busier streets if there is sufficient width and bike lanes. Parents will usually not allow their young children to ride on busy streets, even ones with bike lanes. Group A cyclists are accustomed to riding on busy streets, with or without bike lanes.

Experience level tends to determine whether an adult is a Group A or Group B cyclist. Perhaps one way to distinguish between Group A and Group B cyclists is to observe where they wait for a signal to change at intersections. Experienced, Group A cyclists tend to stay far enough to the left of the curb lane to allow right turning motor vehicles to safely go by on their right. When the light changes, they steer toward the right side of the curb lane across the intersection. This keeps them in direct view of motorists who are also proceeding straight through the intersection and gets them out of these motorists' path as quickly as possible. Since the motorists are starting forward from a standstill, the risk of injury is minimal. Less experienced Group B cyclists tend to hug the curb, even in right turn only lanes, putting them at risk of vehicular traffic turning right across their paths.

Typical bikeway facility system users tend to reflect the AASHTO group categories, though individuals of different groups may choose to ride together, such as when adult parents (Group B) ride with their children (Group C). This combination probably occurs frequently, especially on weekends, but as the AASHTO study author said, these two groups could be combined, making them functionally one group.

Class 1 bikeway facilities will attract users other than cyclists, so studies tend to regard them as multi-use paths that will also be used by skaters, joggers, recreational and exercise walkers. Experience has shown this to be the case, and unless the numbers of users become excessive, this mixed use is acceptable. This mixing of uses tends to occur primarily on paths with relatively benign grades. Experienced cyclists who prefer to travel at higher speeds tend to avoid Class 1 facilities that attract other types of slower users in favor of less traveled, more challenging routes, including those with significant hills, with or without Class 2 or 3 facilities.

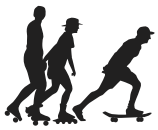
5.2.2 User Capabilities

Typical user capabilities vary considerably depending on age, experience and physical conditioning. Figure 5-1: Bikeway User Profiles, summarizes the average speeds and distances of which specific user types are generally capable. Note that these averages vary widely within the cyclist groups, and within the non-cyclist user types. Skaters' speeds closely approximate cyclist speeds, for instance, while recreational walkers move considerably slower than cyclists. It should be noted that speed and maneuverability are inversely proportional.

Another crucial aspect of user capability is experience, which can also be defined as knowledge of appropriate traffic behavior or roadway aptitude. This factor is not as tangibly measured as physical capabilities, but it is no less important. It can probably be assumed that Group A cyclists are far more knowledgeable about appropriate traffic conduct than other cyclists and are likely to be the most attentive users due to long-term roadway experience. However, bikeway facility design and planning must also take into account the other end of the spectrum, meaning not only the much larger numbers of Group B and Group C cyclists, but also the skaters, joggers and walkers that are likely to use a Class 1 bikeway facility. These users can represent all levels of experience and, therefore, all levels of roadway aptitude.

Vehicle right turning movements can be stressful for even experienced cyclists.

Figure 5-1: Bikeway User Profiles

		Typical Ages	Preferred Facility	Typical Usage	Days per Week	Speed Range	Average Distance	Typical Origins and Destinations
Kids		6-16	Sidewalks, trails, quiet streets, flat terrain (Class I)	Early weekday mornings and afternoons, weekends	5-6	4-8 mph	1-2 miles	Residences, schools, parks, open space, retail centers
Family Recreational		6-65+	Quiet streets, scenic trails, flat terrain (Class I)	Weekends, occasional early evenings	1	5-10 mph	2-4 miles	Residences, parks, open space
Adult Exercise		25-65+	Quiet streets, scenic trails, flat terrain (Class I & II)	Weekends, occasional early evenings	1-2	8-15 mph	5-20 miles	Residences, parks, open space
Commuters		18-55	Streets, bike lanes, direct arterial routes (Class II & III)	Early weekday mornings and late afternoons	4-6	10-20 mph	3-20 miles	Residences, employment centers, retail centers
Serious Cyclists		18-55+	Arterials, flat or hilly circuitous routes (Class II & III)	Weekday mornings and late afternoons, weekends	2-5	12-25 mph	20-75 miles	Residences (Rides typically originate or extend outside city)
Skaters Skateboarders		8-45	Quiet streets, paved trails, flat terrain, (Class I)	Weekends, occasional early evenings	1-2	5-15 mph	2-5 miles	Residences, schools, parks
Joggers		18-55	Sidewalks, scenic trails, flat terrain (Class I)	Early weekday mornings and late afternoons, weekends	3-6	5-9 mph	3-5 miles	Residences, parks, open space
Recreational Walkers		16-70+	Sidewalks, Scenic trails, flat terrain (Class I)	Weekday mornings and late afternoons, weekends	2-5	3-5 mph	1-2 miles	Residences, parks, retail centers
Exercise Walkers		16-70+	Sidewalks, scenic trails, flat terrain (Class I)	Weekday mornings and late afternoons, weekends	2-5	4-7 mph	2-4 miles	Residences, parks, open space

5.3 Bicycle/Roadway Compatibility Analysis

Another aspect of bikeway facility system safety is the compatibility of specific roadway configurations and roadway conditions with bicycling. The existing bikeway system and potential additions were reviewed for compatibility in terms of problems that have typically been encountered in similar situations in other cities and the specific problems encountered during field investigation.

5.3.1 Typical Roadway and Intersection Conflicts

A number of different types of conflicts can occur between motor vehicles and bicycles. Fault often lies with the motorist's failure to see and rightfully yield to the cyclist or because the cyclist does not rightfully yield to the motor vehicle. In either case, the cyclist is bound to suffer the most from the encounter.

The first class of conflicts occurs while motor vehicles or bicycles are turning at intersections. (See Figure 5-2: Controlled Intersection Conflicts.) Many of the scenarios illustrated in the graphic occur where vehicular turning motions catch cyclists unaware because they assume the motorist sees them and expect the driver to yield. The motorists involved in these scenarios often misjudged the cyclists' speed, or simply did not see the oncoming cyclists. Many non-cyling motorists do not realize how fast a bicycle can go, nor that cyclists have equal vehicular rights and responsibilities under California law.

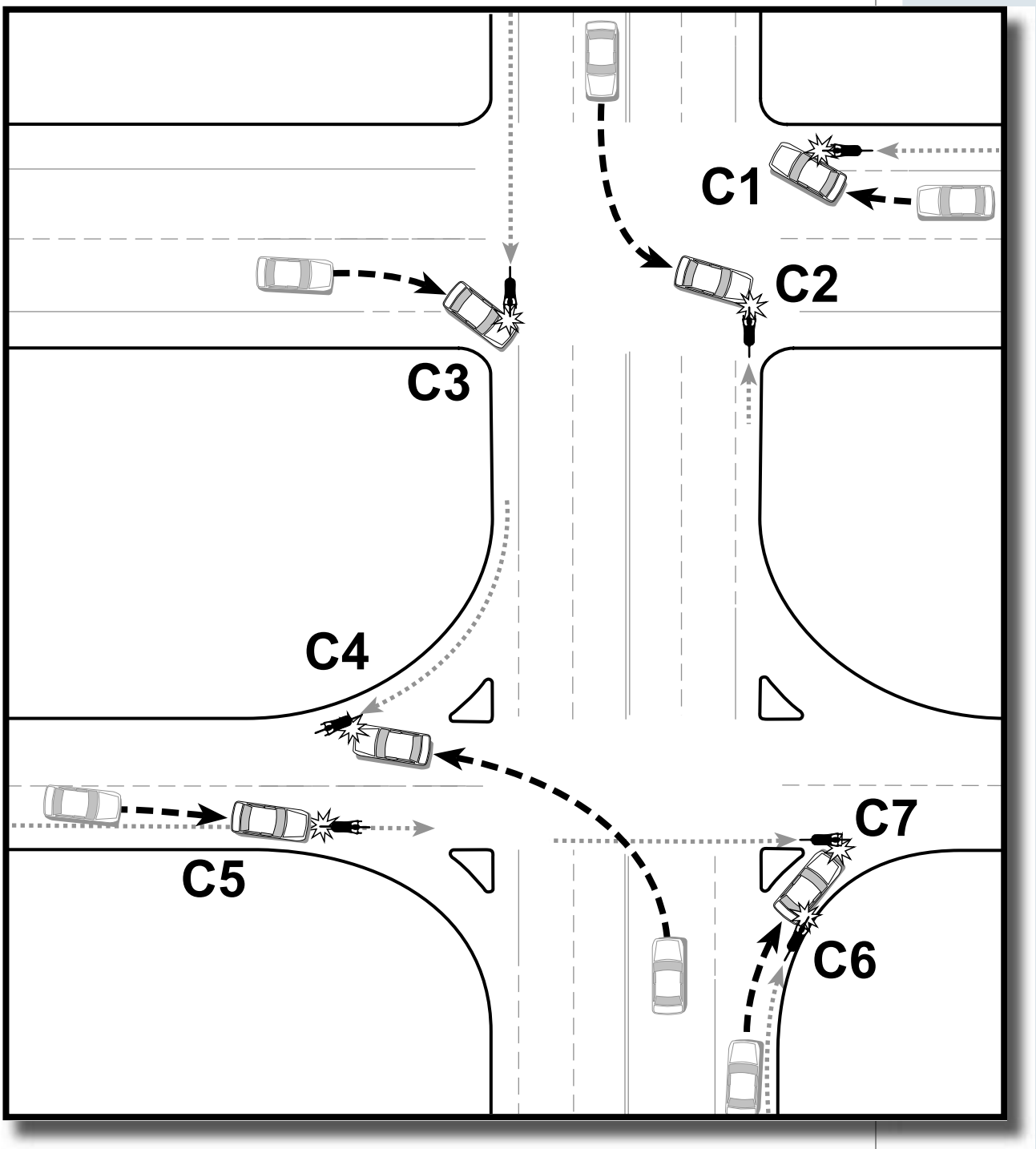
Several of these crash scenarios (C4-C7) occur at high speed, large radius right turn intersections. This configuration is not conducive to safe cycling or walking because it encourages motorists to maintain relatively high speeds entering and exiting the intersection. This also encourages the motorist to pay attention to traffic approaching from the left, ignoring pedestrians or cyclists on the right, which can endanger cyclists either turning or proceeding straight through the intersection. This configuration is unsafe for walkers for the same reasons and because it creates a much wider crossing than a standard intersection. Redesigning the islands to slow motor vehicle traffic or installing stop signs may improve both bicycle and pedestrian safety, though experience has shown that motorists tend to show less regard for regulatory signage at these high speed, large radius turns.

The second major class of conflicts is those that occur where motor vehicles can enter or exit the roadway at other than established intersections, such as at curb cuts or freeway ramps. Once again, many of these can occur when the motorist fails to see and yield to the cyclist. (See Figure 5-3: Uncontrolled Non-intersection Conflicts.) These scenarios are similar to those that can occur at intersections, but those at freeway ramps can be even more dangerous for the cyclist because vehicles may be moving faster than they would at a controlled intersection. Crashes can occur due to the cyclist negligence, but of all six conflicts illustrated in this graphic, only the third one (U3) is most likely to be the fault of the cyclist.

The third class of conflicts occurs along roadway segments away from intersections. Though the majority of crashes occur at intersections and they are generally the most severe, cyclists can and do get hurt on roadway segments away from intersections. (See Figure 5-4: Roadway Segment Conflicts.) Most of Encinitas's arterials are ideal for cyclists in terms of curb lane widths and the limited number of curb cuts. However, there is the possibility of a motor vehicle drifting into the bicycle lane at high speed, though this is extremely rare.

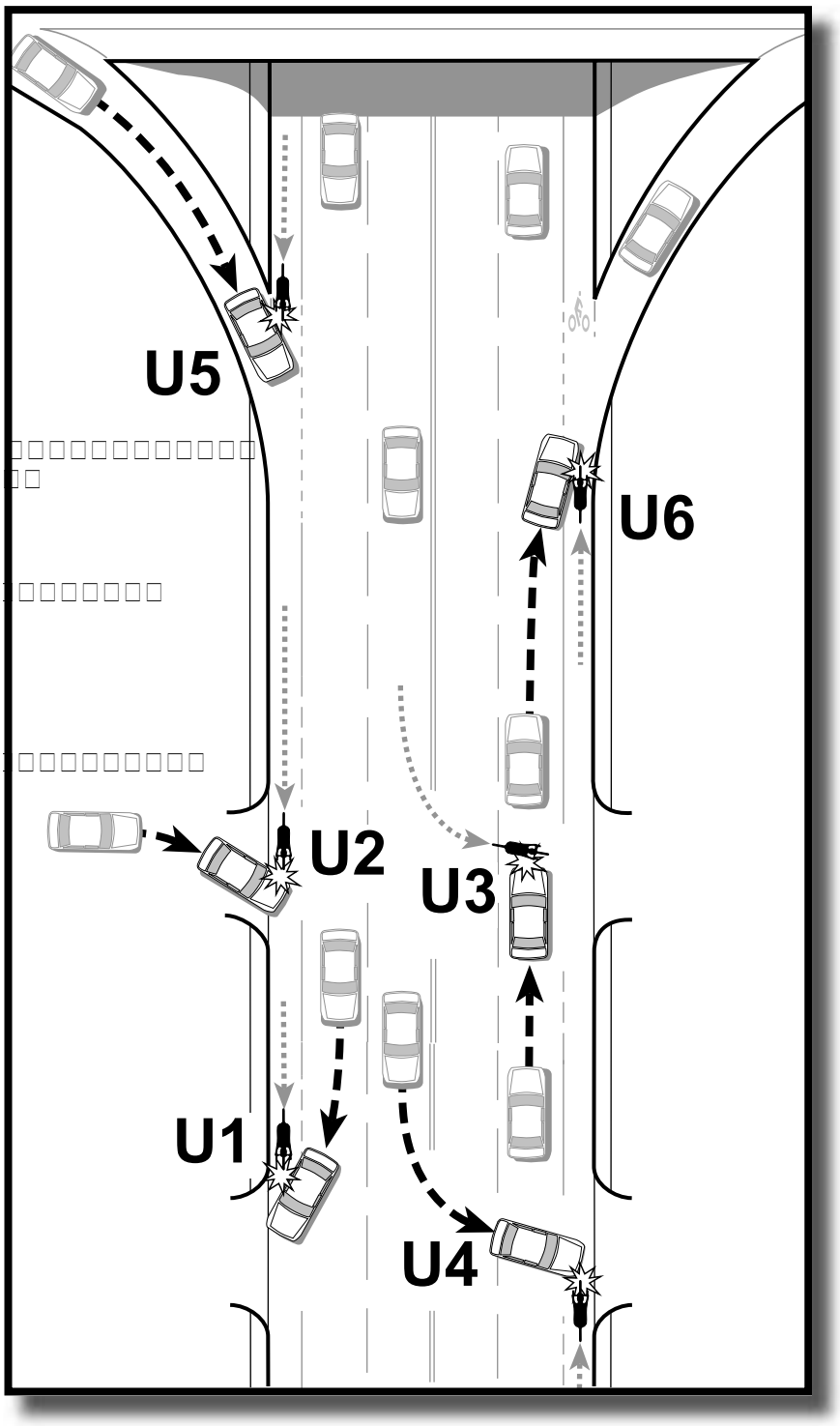
Note that three of these conflicts involve parked vehicles (R1-R3). Vehicular parking along bicycle routes is generally less satisfactory in terms of safety, but some types of parking are more problematic than others. Vehicles illegally parked on the bicycle route itself (R1) or parallel parking with its inherent door opening conflicts (R3) are still probably not as dangerous as angle parking (R2). This is because a motorist leaving an angle parking space may be unable to see the approaching cyclist due to the adjacent vehicles. Conflict R5 (vehicle backing out of driveway) is very similar to R2 when on-street parking is present. Finally, R6 (vehicle overtaking cyclist with inadequate passing width) can occur on bridges where roadways often narrow.

Figure 5-2: Controlled Intersection Conflicts



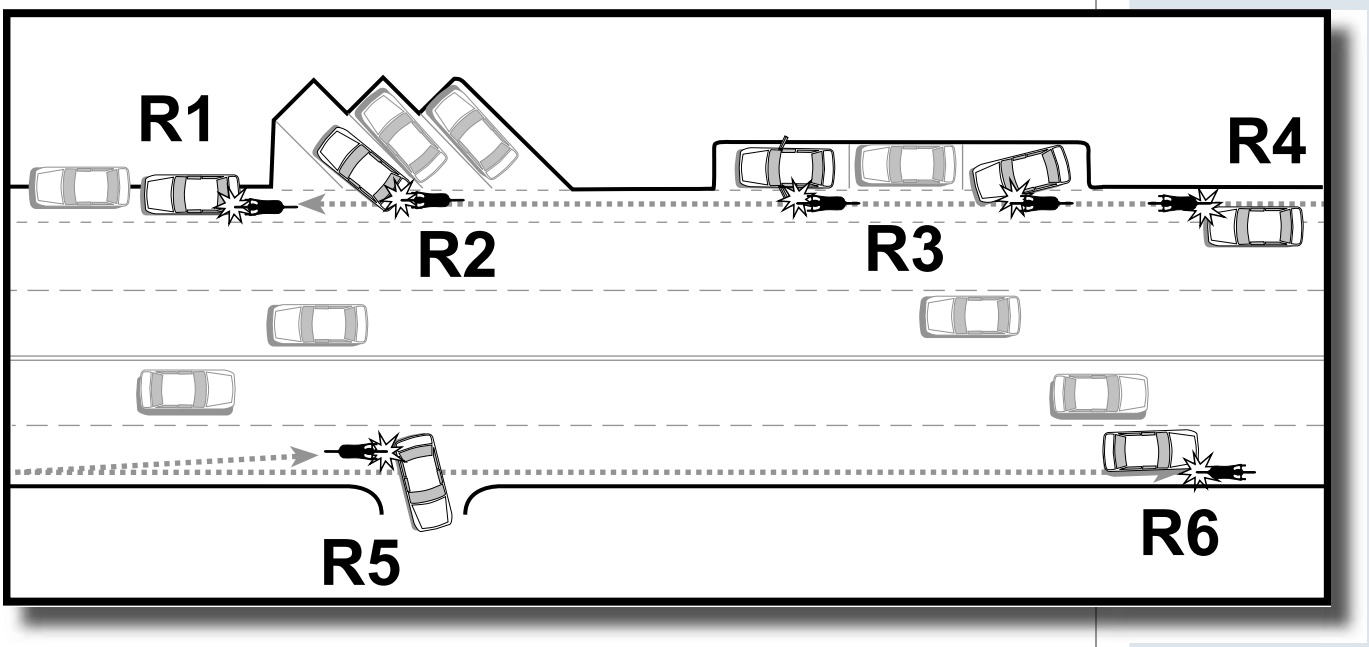
C1 Vehicular right turn across bike lane
C2 Vehicular left turn from oncoming traffic
C3 Vehicular right turn from perpendicular roadway
C4 Vehicular left turn into bicycle exiting a wide radius right turn
C5 Vehicular high speed right turn overtaking straight-through cyclist prior to intersection
C6 Inadequate high speed exit lane passing width
C7 Vehicular high speed right turn into cyclist at intersection

Figure 5-3: Uncontrolled Non-intersection Conflicts



U1 Overtaking vehicle turning right into curb cut
U2 Vehicular right or left turn from curb cut across bike lane
U3 Bicycle left turn to curb cut
U4 Oncoming vehicle left turn to curb cut
U5 High speed vehicular merge lane from off-ramp
U6 High speed vehicular merge to on-ramp

Figure 5-4: Roadway Segment Conflicts



R1 Vehicles parked in bicycle lane
R2 Vehicle backing out of angle parking
R3 Vehicle opening door or pulling out of parallel parking
R4 Overtaking vehicle drifting into cyclist
R5 Vehicle backing out of driveway
R6 Vehicle overtaking cyclist with inadequate passing width

5.4 Crash Data Analysis

There were 687 bicycling deaths and 51,000 bicycling injuries resulting from traffic crashes in the United States in 2000. This is eight percent less than in 1999 and down 32 percent since 1975. While these numbers continue to decrease from year to year, bicyclist fatalities still account for two percent of all traffic fatalities, as well as two percent of all traffic injuries.

To help evaluate bicycling conditions in Encinitas, the consultant analyzed ten years of data provided by the City, from 1993 to 2003, for reported crashes involving bicycles. These data points were digitized onto a City street map and analyzed for trends in crash types and clusters. The reported crash locations were also compared to posted speed limits and traffic volume to determine if there were any correlations. For graphic clarity, locations where multiple crashes had occurred were highlighted with larger dots representing aggregations of crashes. The resulting graphic presents a hierarchy of dot sizes illustrating the specific locations with the highest concentrations of crashes involving bicycles. (See Figure 5-5: Crash Locations.)

Though bicycle crashes have occurred throughout the City over the last ten years, crash concentrations became evident when the locations were plotted and their strong correlation with ADTs also became evident. These locations are primarily Coast Highway 101, Encinitas Boulevard and El Camino Real. Specifically, the highest occurrences of crashes involving bicycles was at or near the intersections of these major roadways.

There was a total of 265 reported crashes involving bicycles, and an average of just over 24 per year over the eleven years. The yearly totals ranged from a high of 29 in 1993 to a low of 14 in 2001. Overall, the trend had been relatively flat, but there has been a definite tendency to fewer crashes since 1999.

5.4.1 Coast Highway 101

Coast Highway 101 had the most crashes involving bicycles, 74 of the 265 reported in the eleven years of data collected, or 28 percent of all reported crashes involving bicycles. Motor vehicle traffic on this roadway ranged from 12,000 to 20,000 ADTs north of Chesterfield Drive to 20,000 to 30,000 to the south. This is known to be a very popular recreational route also used by many serious road cyclists and triathletes for training rides. The 1990 Bikeway Master Plan cited a figure of "...over 2,000 cyclists per day on a typical Saturday."

Crashes were scattered throughout the length of Coast Highway 101 through Encinitas, but there was a notable concentration at the intersection of Encinitas Boulevard and at D Street. There was also a number of crashes in a linear concentration between D Street and Santa Fe Drive. Closer examination of the data reveal that many of the crashes involved motor vehicles making right and left turns, though most were proceeding straight when the crash occurred. Several other crashes occurred when motor vehicles were backing up, passing or traveling the wrong way. A small number of crashes occurred when the motor vehicle was stopped or parked. The most prevalent crash type were those involving motor vehicles making left turns or performing parking maneuvers while bicycles were proceeding straight.

Another "hot spot" is the intersection of Coast Highway 101 and Chesterfield Drive. Many of the crashes at this location involved motor vehicle turning movements while cyclists were proceeding straight. It should be noted there is a large radius right turn northbound off Coast Highway 101 onto eastbound Chesterfield Drive.

Finally, the portion of Coast Highway 101 between Santa Fe Drive and Chesterfield Drive had no reported crashes in the ten year data collection period. This segment has no cross streets south of K Street and fairly wide curb lanes, as well as an unofficial "multi-use path" along the west side. It is likely that the relative lack of motor vehicle turning movements and wide curb lane account for the lack of crashes.

5.4.2 Encinitas Boulevard

Encinitas Boulevard experienced 48 crashes involving bicycles, 18 percent of all crashes involving bicycles in the ten years of data collected. The most common crash type was motor vehicles turning right while the bicycles involved were proceeding straight. The majority of the crashes occurred at or near Coast Highway 101, Interstate 5 and El Camino Real.

5.4.3 El Camino Real

There were 19 crashes involving bicycles in the ten year period on El Camino Real, seven percent of all crashes involving bicycles. A linear series of crashes occurred on North El Camino Real between Gardenview Road and Encinitas Boulevard. ADTs are particularly high here which, at more than 30,000 vehicles per day, ranks among the highest traffic levels in the city (along with a short section of Encinitas Boulevard just east of Interstate 5).

This area is also a commercial retail hub and probably experiences a high degree of motor vehicle lane changes and other movements on and off the roadway. Analysis of specific crashes revealed a pattern similar to other areas noted previously and that many of the crashes involved motor vehicle right and left turns, while most cyclists involved were proceeding straight when the crashes occurred.

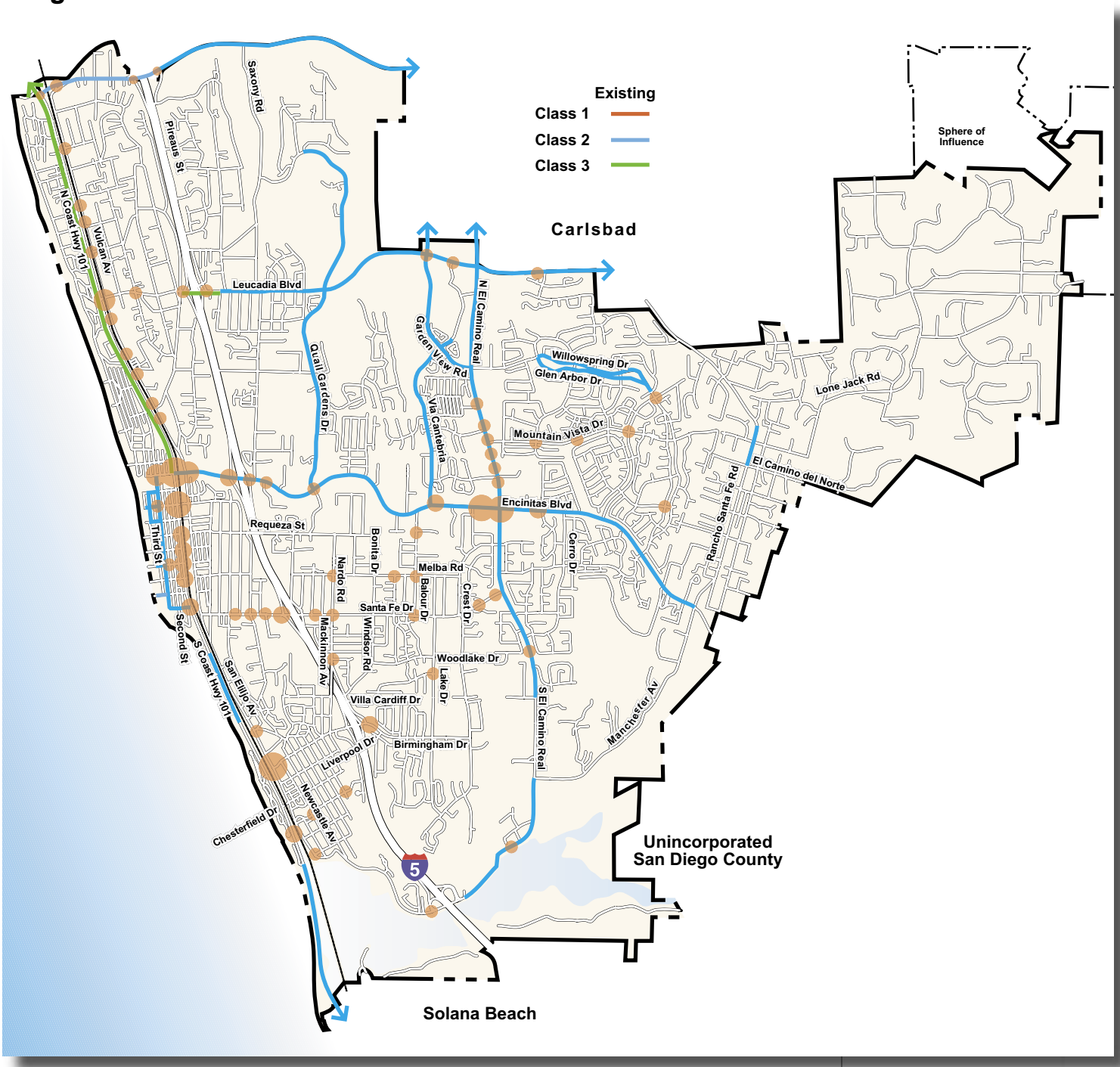
5.4.4 Interstate 5 Crossings

There is a secondary set of crash concentrations involving bicycles at all the Interstate 5 crossings. The number of crashes is low compared to the other concentrations noted above, but they are remarkably consistent. This is likely the result of conflicts with motor vehicle lane changing and turning movements as drivers exit and enter the freeway and cyclists proceed straight, having to cross high-speed on- and off-ramps. Analysis of the data revealed the most common crash type involved motor vehicles turning right while bicycles were proceeding straight, as well as other crashes involving motor vehicles making other turning movements. This includes a series of crashes on Santa Fe Drive near Interstate 5.

5.4.5 Additional Crashes

The remainder of crashes involving bicycles appears to be scattered incidents primarily in the southwest and northeast quadrants of the city. They occur almost exclusively at intersections, but their minimal numbers over ten years do not point to any other trends. Most of these locations experienced one crash in that time, and most involved a turning motion, either by the motorist or the cyclist.

Figure 5-5: Crash Locations



Source: City of Encinitas

5.5 Specific Problem Areas

Like any city, a range of specific issues affect cycling in Encinitas, based on consultant field work and community workshop participant and questionnaire comments. Many of these problems were pavement and roadway maintenance issues. Examples of pavement problems included rough resurfacing, pavement heaved by tree root encroachment, lack of curbing allowing dirt and leaf debris to encroach on the roadway, and worn out and barely visible edge striping.

There were also problems of roadway configuration such as narrow roadways with limited sight lines, vehicular free right turn merge lanes from freeway off-ramps, turn lanes onto freeway on-ramps and multiple curb cuts near busy intersections. A lack of signage was also noted.

The specific problem areas cited in community workshop participant and questionnaire comments included entire roadway segments as well as specific locations, which where often intersections. Several of these locations generated multiple comments. These locations and their perceived problems are discussed in this section. Analysis was based on both community workshop participant and questionnaire comments and consultant field review.

In most cases, these locations currently lack bikeway facilities. Recommendations are discussed in Chapter 8 and include proposed bikeway facility improvements that address these specific areas and make them parts of a comprehensive bikeway system.

5.5.1 Coast Highway 101

The existing bikeway facilities on Coast Highway 101 are discontinuous, including adjacent facilities that are substandard, but currently used as bikeways. This is particularly true of southbound Coast Highway 101 starting several hundred feet south of Swami's Park where an adjacent asphalt path is marked as a bike route. This path is separated from the roadway by a guardrail, but it does not satisfy Caltrans criteria for a Class 1 bikeway. It is also heavily used by pedestrians throughout the week.

Further north is a wide asphalt path on the west side of southbound Coast Highway 101 between K Street and the entrance to Swami's Park. It is separated from the roadway by an asphalt curb, but is also ineligible for Class 1 designation. This segment and its curb were noted in several workshop and questionnaire comments.

The northbound (east) side of North Coast Highway 101 between Encinitas Boulevard and Marcheta Street has a similar, but even narrower path running along it several feet from the roadway. This pathway is only about five feet wide and often has sand spilling across it. It appears to be lightly used.

Coast Highway 101 itself also often has sand and other debris spreading out onto the pavement. There is no curb to retain the dirt, sand and leaves and sweeping appears to be infrequent. The paving edge is uneven and the pavement is rough near the immense eucalyptus trees growing immediately adjacent to the roadway, apparently due to root intrusion under the asphalt.

The section of Coast Highway 101 in downtown coastal Encinitas is not designated as a bikeway since parallel routes were installed on streets immediately to the west, such as a Class 2 facility on Third Street. This section of Coast Highway 101 has been reconfigured in recent years to better accommodate motor vehicle parking and pedestrian access by installing angle parking and traffic calming devices such as raised medians and curb extensions.

Angle parking, in general, is not conducive to cycling and the photographs on this page help to illustrate why. It is difficult for motorists to watch for oncoming traffic over their right shoulder while attempting to back out into the travel lane from an angled parking slot, especially when the neighboring spaces harbor SUVs or other tall vehicles. Also, the angle parking configuration allows and sometimes even forces drivers of wider vehicles to encroach outside the curb lane space as they pass, forcing experienced cyclists to "take the lane" to ensure their visibility and safety.

Coast Highway 101 - Encroaching debris

Coast Highway 101 - Downtown redevelopment included dual lanes and adjacent angled parking

Vulcan Avenue - Uneven pavement edge with minimal shoulder

Vulcan Avenue - Debris encroaching on roadway

Encinitas Boulevard at Saxony Road and Interstate 5

5.5.2 Vulcan Avenue

Sections of Vulcan Avenue have been recently widened, but community workshop and questionnaire comments complained that the asphalt had been sloppily patched, making the surface dangerously uneven. Also, some segments lack curbs which allows debris to encroach on the roadway. One questionnaire comment noted that harassment of cyclists by motorists has increased in this area.

5.5.3 Encinitas Boulevard

Encinitas Boulevard's existing westbound Class 2 lanes end at Saxony Road before reaching Interstate 5 and cyclists are required to cross two motor vehicle right turn lanes at Saxony Road and Interstate 5 to continue straight under Interstate 5 to the beach area. This section of Encinitas Boulevard immediately east of Interstate 5 experiences one of the highest levels of motor vehicle traffic in the City, exceeding 30,000 average daily trips (ADTs). Several workshop and questionnaire comments noted this is a problem intersection.

Manchester Avenue at Interstate 5

5.5.4 Manchester Avenue

Manchester Avenue at Interstate 5 was noted in workshop comments as having short sight distances, poor pavement conditions and a configuration similar to the previous location that forces the cyclist to cross through turning motor vehicle traffic, both entering and exiting Interstate 5 when the cyclist is proceeding westward straight under Interstate 5 toward the coast.

Another section of Manchester Avenue between El Camino Real and Rancho Santa Fe Road was perceived as narrow, especially considering the combination of grades, curve radii and traffic volumes. This route appears to be fairly heavily used by cyclists, especially on weekends, even though it has 12-foot lanes with virtually no shoulders.

Manchester Avenue between El Camino Real and Rancho Santa Fe Road

San Elijo Avenue - Narrow roadway with tight curve radii and limited sight distances

5.5.5 San Elijo Avenue

The section of this roadway west of Manchester Avenue is one of the narrowest in Encinitas. It also has fairly tight curve radii and grades that limit sight lines.

The section of San Elijo Avenue between Kilkenney Drive and Orinda Drive is in especially poor condition with crumbling pavement edges. The damage seems to coincide with areas of on- and off-street parking. Vehicles on the east side parallel park and vehicles on the west side park more haphazardly, either angled or perpendicular to the roadway and this is where the paving is in the worst condition.

San Elijo Avenue - Crumbling pavement edges correspond with off-street and on-street parking

5.5.6 Birmingham Drive at Interstate 5

Workshop comments noted two service stations at this location as well as a street intersection in close proximity to the Interstate 5 on-ramp, a configuration similar to other intersections of Interstate 5. The resulting number of motor vehicle turning movements makes it uncomfortable for cyclists, though the traffic control devices (stop sign eastbound and traffic signal westbound) on Birmingham Drive at either end of the segment crossing Interstate 5 probably help to control motor vehicle traffic speeds.

Birmingham Drive at Interstate 5

5.5.7 Leucadia Boulevard

Leucadia Boulevard west of Interstate 5 has a number of curb cuts that at least one comment noted as dangerous for cyclists. Other comments noted that the crossing over Interstate 5 was dangerous due to the curb cuts, the lack of bikeway facilities such as a striped lane, and the narrowing of the roadway as it proceeded westward from Interstate 5 and transitioned from two lanes each way into one in an area with numerous vehicular turning movements.

Leucadia Boulevard at Interstate 5

6

Opportunities and Constraints

Most of the bikeways proposed in this bikeway master plan update have been proposed in other documents, such as in the existing 1990 Bikeway Master Plan and in specific plans. 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 Encinitas are in place.

6.1 Opportunities

6.1.1 Future Street Additions with Bicycle Facilities

The City of Encinitas' policy of including Class 2 bikeway facilities on arterial streets has created a comprehensive network on such streets in much of the City. When road and bikeway facility development is complete as planned, it will provide a comprehensive network of Class 2 routes throughout the City. Many experienced cyclists prefer on-street facilities and they should find that the finished on-street system will provide ample and adequate routes for cycling.

The coastal area's scenic quality and gentle grades makes it both an attractive destination and route

6.1.2 Coastal Rail Trail

As the sole Class 1 facility proposed within Encinitas, the planned Coastal Rail Trail should provide an attractive alternative to the adjacent roadways for many recreational cyclists. It is anticipated that this will be a highly desirable recreational route because it capitalizes on the flat terrain and scenic character of the coastal zone, as well as much of its route being free of motor vehicle traffic. Since it is a portion of a long-range, truly regional bikeway route connecting all the coastal cities of San Diego County from Oceanside to San Diego, it should be attractive to many commuting cyclists as well. It is likely, however, that "serious" cyclists will continue to use adjacent roadways such as Coast Highway 101 for training and conditioning riding.

Coastal Rail Trail - This planned rail trail route is certain to be a popular bicycle facility

6.1.3 Trail System

The City of Encinitas recently adopted the Recreational Trails Master Plan in 2002. Even though bikeway master plans specifically address bicycle facilities on paved roadways, a community's trails are relevant, even if they are unpaved and are not intended to meet Caltrans bikeways standards. This is especially true wherever connections can be made that enhance intra-community connectivity by linking the two systems because the majority of bicycles being purchased today have wide tires and can be safely ridden on firm surfaces such as compacted decomposed granite (DG). Therefore, these two non-motorized systems can be regarded as complementary extensions of each other.

In many cities, potential connections between the trail system and on-street bikeways by limited by the low number of trails. However, in Encinitas, many proposed trail alignments actually parallel paved roadways, including roadways with bikeways. Connections between the two systems are not lacking. Especially in the eastern half of Encinitas, a cyclist with the proper bike often has the choice of whether to ride on the unpaved trail or the adjacent paved street.

The bikeway system was analyzed in relation to the trail system to ensure that connection opportunities were not being overlooked. For example, if a trail was planned to meet or cross a roadway that did not have a bikeway facility, but was within a reasonable distance of an existing or proposed bikeway facility, the bikeway could be extended to meet the trail, making both non-motorized systems more useful. The trail system will be extensive and connections with the proposed bikeway system should be widely available.

Trail segments along Rancho Santa Fe Road

H Street - Typical residential area near downtown

La Costa Avenue - Limited right-of-way just west of Interstate 5

Rancho Santa Fe Road at El Camino del Norte - Retaining wall to accommodate Class 2 bike lane

6.1.4 Compact City Form

Downtown Encinitas contains many of the bicycle trip generators and destination points that will be accessed by the proposed bikeway system and more are located along the coastal strip north and south of downtown. The downtown area's urban form is a small block grid pattern whose characteristics benefit cycling by dispersing motor vehicle traffic loads across a compact urban area.

This city core also lies within a coastal plain with minimal grades. Most of the bikeway facilities proposed in this study are not encumbered by steep grades. Especially along the coast, grades are relatively flat.

6.2 Constraints

6.2.1 Available Rights-of-Way

Most roadways in Encinitas on which Class 2 bicycle facilities are proposed have rights-of-way averaging 60 feet. However, implementation of some of the proposed routes may be constrained by the lack of available physical space because the roadways on which they are proposed have very limited rights-of-way. Specifically, these are the central portion of Manchester Avenue east of El Camino Real and San Elijo Avenue between Chesterfield Drive and Manchester Avenue with existing rights-of-way of only 40 feet. Especially if motor vehicle lanes are widened or added on these routes, providing bikeways may be difficult or even impossible without land acquisition.

6.2.2 Interstate 5 and Rail Line

An issue common to developing bikeway systems along coastal San Diego County is the obstacles to east-west travel created by Interstate 5 and the rail line. Available crossing points are limited, which forces cyclists to travel out of their desired way to access them.

The existing roadway crossings are all major arterials under and over Interstate 5. Cyclists proceeding straight through are required to cross heavily used motor vehicle turn lanes entering the freeway and then cross motor vehicle traffic exiting the freeway from high speed merge lanes.

Interstate Highway 5 - A significant bikeway constraint for all coastal San Diego County cities

Rail Line - Limited crossing points constrain east-west travel

Encinitas Boulevard - This section just west of El Camino Real is a long, but gradual climb westward

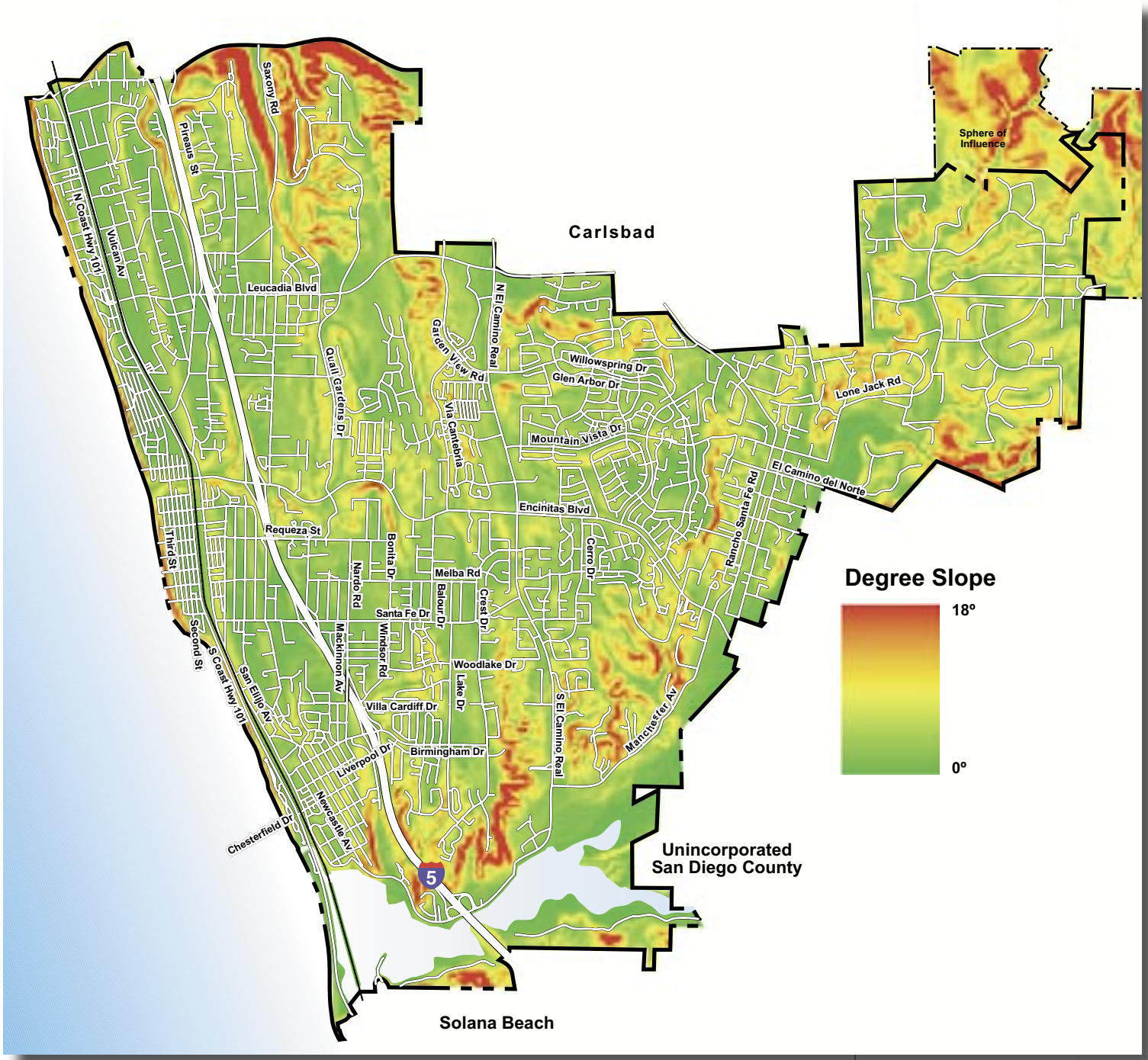
Liverpool Drive - One of the steepest roadways in Encinitas, with grades approaching 20 percent

6.2.3 Steep or Long Grades

Some portions of Encinitas where bikeway facilities already exist or are proposed have significant grades, either particularly long or steep. Hills are a reality of the southern California region and most commuting and "serious" cyclists are probably not deterred by hilly terrain. However, recreational or less experienced cyclists may opt to avoid areas of steep or long grades. (See Figure 6-1: Grades.) An example of a long grade is Encinitas Boulevard west of El Camino Real. Though long, it is fairly gradual and most cyclists probably do not find it objectionable.

Liverpool Drive is an example of a steep route within Cardiff, the steepest developed area of Encinitas. It connects this area to other parts of the city to the east. This route was proposed in the 1990 Bikeway Master Plan and in this study because, due to local topography, there are no alternative routes nearby that would not also be as steep. This route approaches 20 percent in grade, making it likely that only the most fit cyclists will use it.

Figure 6-1: Grades



Encinitas Boulevard - An example of typical arterial traffic volumes

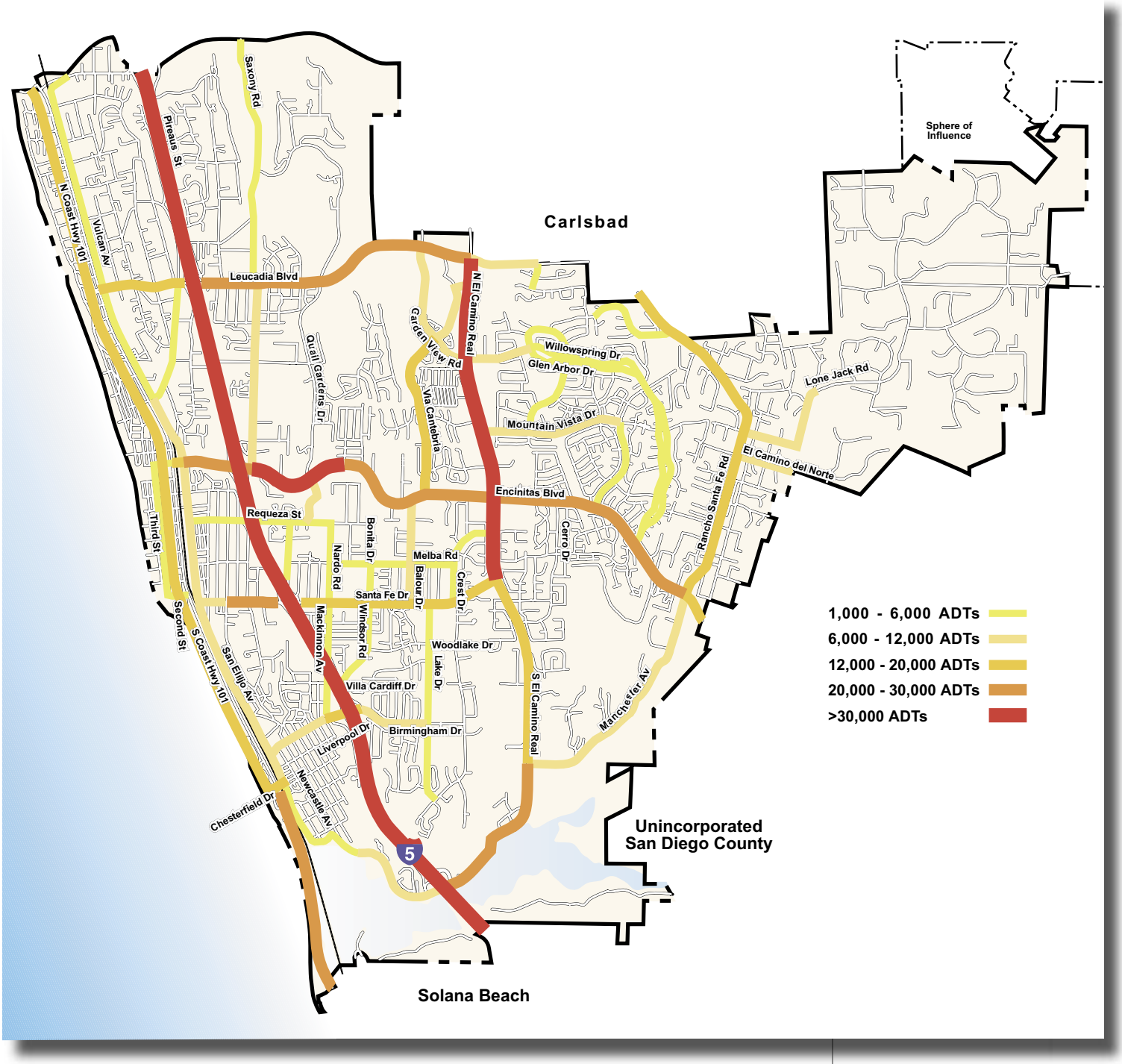
Rancho Santa Fe Road - Typical weekday traffic volume

6.2.4 Traffic Volumes

Average Daily Trips (ADTs) were plotted for the entire city to help determine existing conditions on the major roadways. (See Figure 6-2: Traffic Volumes.) The data were compiled into categories of 1,000 to 6,000 ADTs at the lower end to a high end category of greater than 30,000 ADTs. All roadways shown on the map without a color overlay have less than 1,000 ADTs.

Other than Interstate 5, only two surface street segments in Encinitas have traffic volumes exceeding 30,000 ADTs. They are El Camino Real between Leucadia Boulevard and Santa Fe Road and Encinitas Boulevard between Interstate 5 and Delphinium Street. Both of these roadway segments have lengthy sections of three lanes each way and were designed to support such traffic loads. On the other hand, Rancho Santa Fe Road north of Encinitas Boulevard currently experiences 12,000 to 20,000 ADTs on a relatively narrow roadway with numerous cross streets.

Figure 6-2: Traffic Volumes



Source: SANDAG

6.3 Connectivity Issues

A number of issues and opportunities affect cycling connectivity in Encinitas. The issues are generally physical, primarily topography, and the opportunities can provide ways to circumvent the physical obstacles.

6.3.1 Local Geomorphology

While coastal Encinitas is relatively level, the south coastal area of Cardiff lies on a ridge line facing the ocean. Especially in the east-west direction, some cyclists will find the some of these grades to be insurmountable and many will find them too strenuous for routine use.

6.3.2 Interstate Highway/Coastal Rail Line

Interstate 5 and the coastal rail line running through Encinitas create some connectivity problems. Traversing the typical freeway interchanges when crossing under or over the freeway can be a disagreeable experience as the cyclist is forced to deal with a frequent lack of bikeway facility striping, as well as motor vehicles making lane changes onto multiple on- and off-ramps at speeds considerably higher than a cyclist's normal speed. Similarly, crossing points across the coastal rail line are limited, which forces cyclists to travel out of their desired way to access them.

6.3.3 Discontinuous Bikeways

Community meeting and questionnaire comments pointed out the need to connect or upgrade several well used routes to Class 2 standards to improve connectivity. These included routes connecting to adjacent cities and unincorporated County lands such as Coast Highway 101, Vulcan Avenue, Rancho Santa Fe Road and El Camino del Norte. Other comments requested similar improvements on roadways crossing Interstate 5 since several have bikeway facility gaps coinciding with the freeway right-of-way.

6.4 Safety Issues

The study questionnaire revealed that respondents' primary concerns were about road conditions, motorist behavior and high speed on- and off-ramps and merge lanes. Field experience also indicated that general safety priorities should include Class 2 striping of roadways that cross freeways. Other priorities should include the specific problem areas described in Section 6.1: Problem Areas.

6.4.1 Narrow Roadways

Narrow roadways are not necessarily a safety issue for cyclists, but combining reduced roadway width with high motor vehicle speeds or volumes can make a roadway less desirable as a bikeway facility. This is particularly true of Manchester Avenue east of El Camino Real. In addition, questionnaire respondents mentioned San Elijo Avenue west of Manchester as a particularly uncomfortable location, especially the combination of narrow lanes, grades and tight curves.

6.4.2 High Posted Speed Limits

Like roadway width, high posted speed limits alone may not be a deterrent to designating a bikeway facility on a particular roadway. For example, many of the facilities in the central Encinitas east of Interstate 5 are on roadways with posted speed limits of up to 50 m.p.h. However, many less experienced cyclists will feel uncomfortable using these major roadways, even with striped Class 2 lanes.

7

Community Input

Community input into this master plan process was accomplished through workshops at City Hall in March and June of 2004, as well as Traffic Commission and Planning Commission meetings. At the first meeting, attendees were shown a PowerPoint presentation of the issues analyzed in developing a proposed bikeway system for Encinitas. The number of attendees allowed for an informal format during which attendees could ask questions and make observations. The workshop attendees were then encouraged to mark up large bikeway system maps with written comments. These observations and comments demonstrate the value of community meetings since the comments often verified consultant observations, as well as highlighted additional issues to be analyzed. Local knowledge is invaluable.

7.1 Questionnaire

Attendees were also asked to fill out a questionnaire with information such as where they lived, what types of bikeway facilities they preferred, what types of system improvements would convince them to ride more often, why and when they generally rode and any additional comments about specific issues or general comments about the city's current bikeway system. (See Figure 7-1: Questionnaire.) These comments were compiled in Section 7.2 to follow. The consultant uses similar questionnaires for all bikeway projects to gauge user opinion across the cycling population.

All but two respondents lived in Encinitas. The exceptions lived in San Marcos and Carlsbad. When asked to prioritize bikeway improvements, "provide more Class 2 facilities" ranked the highest, closely followed by "fix problems with existing streets and intersections with bike hazards." These two items were essentially tied. "Provide for a better interconnected system, filling in missing gaps" was next in importance, but also highly ranked, while "provide wider shared lanes on existing roads," provide more Class 1 facilities," and "provide more Class 3 facilities trailed in that order, and well behind the first three priorities.

When asked what types of improvements would convince them to commute by bicycle more often, the top choice selected by seven respondents was "provide trails separated from the road and busy traffic," followed by "increase maintenance along routes removing potholes and debris" selected by six respondents. Tied for third and selected by five respondents were four choices including "emphasize safe routes to schools and local parks," "concentrate on problem intersections and high speed on/off ramps," "improve public education with an emphasis on sharing the road," and "improve intersection bike loop detection systems." Fourth and selected by four respondents was "provide more

Figure 7-1: Questionnaire

City of Encinitas Bikeway Master Plan Update

The City of Encinitas has hired KTU+A to update the bicycle facilities master plan for all public roa
will be used to help gauge bike use patterns in Encinitas, determine where facilities are missing a
You do not have to be a resident to fill out this questionnaire, but you should be a cu

1. What city do you live in? ☐Encinitas ☐Carlsbad ☐Solana Beach ☐San Marcos ☐Oceanside ☐Del Mar ☐San Diego
Write in a city or county area if you are not a resident of a listed city: _____

2. Optional Contact Information:
If you would like to be contacted about future meetings or presentations about this project, please

E-mail Address: _____

Mailing Address: _____

3. Please prioritize the following list of bikeway improvements with "1" being the most important and "6" being the least important.

☐ Provide more Class 1 facilities (trails separated from ☐ Provide wider shared lanes on existing roads (no la
☐ Provide more Class 2 facilities (bike lanes painted o ☐ Fix problems with existing streets & intersections
☐ Provide more Class 3 facilities (no painted lanes, jus ☐ Provide for a better interconnected system, filling e signs)

4. What types of improvements would convince you to utilize your bike for commuting in Encinitas more often?
(If an item is not a priority, leave it blank.)

☐ Provide trails separated from the road and busy traf ☐ Provide more multi-modal connections with other
☐ Emphasize safe routes to schools and to local parks ☐ Insist that large employers provide showers & bik
☐ Provide more Class 2 bike lanes on safe streets ☐ Concentrate on problem intersections & high spee
☐ Mark safe routes on low volume / low speed streets ☐ Improve public education with an emphasis on sh
☐ Increase maintenance along routes removing potho ☐ Improve intersection bike loop detection systems les

5. What type of activities are you most interested in? (Please check all that apply.)

	Cycling for Transportation	Cycling for Exercise or Sport	Cycling for Recreation	Cycling for Social / Family Activity	Running on Multi-use Trails	Walking on Multi-use Trails
	☐	☐	☐	☐	☐	☐

6. How often do you currently take part in these activities? (Put checks only under activities picked off in Question #5)

Daily	☐	☐	☐	☐	☐	☐
2-3 Days per Week	☐	☐	☐	☐	☐	☐
Weekly	☐	☐	☐	☐	☐	☐
2-3 Times per Month	☐	☐	☐	☐	☐	☐
Monthly	☐	☐	☐	☐	☐	☐
A Few Times per Year	☐	☐	☐	☐	☐	☐

7. When do you like to do these activities?

Weekday Mornings	☐	☐	☐	☐	☐	☐
Weekday Day	☐	☐	☐	☐	☐	☐
Weekday Evenings	☐	☐	☐	☐	☐	☐
Weekend Mornings	☐	☐	☐	☐	☐	☐
Weekend Day	☐	☐	☐	☐	☐	☐
Weekend Evenings	☐	☐	☐	☐	☐	☐

8. Please provide comments on specific issues or general comments on what needs to be done in the City of Encinitas to improve bikeway facilities.

_____

_____

_____

_____

_____

_____

How did you hear about this workshop? ☐Flyer ☐Newspaper ☐Internet ☐Word of mouth ☐Other _____

multi-modal connections with other transit facilities." Sixth and selected by two respondents was "insist that large employers provide showers and bike lockers at work." Last and selected by one respondent was "mark safe routes on low volume/low speed streets."

When asked what type of activities they were most interested in, most respondents said that they cycled for exercise or sport, followed by cycled for transportation, recreation, social/family activity, or run or walk on multi-use trails.

When asked how often they currently take part in the activities listed in the previous question, the most common frequency by far was "two or three days a week," which far exceeded any other frequency category.

When asked when they most often did these activities, the most common response was weekday mornings, followed by weekday evenings. This is different from other bikeway master plans completed by the consultant. In other cities, the most commonly listed time is generally weekend mornings. This probably reflects a higher level of cycling activity in Encinitas than in other cities.

7.2 Community Workshop and Questionnaire Comments

All community workshop attendees' comments provided on the comment maps and at the end of their questionnaires were compiled and assembled into categories with minor editing as needed for clarity. Comments were initially categorized as general or location-specific. General comments were further categorized under safety, bikeway standards, signage, education, maintenance, multi-modal and connectivity. Specific location comments were grouped by the location. Note that some comments mentioned a general issue, but about a specific location. These comments were categorized under the location mentioned.

7.2.1 General Comments

Comments concerning issues other than specific locations were categorized as general comments. During analysis, these comments were further categorized as topics became evident.

Safety

Provide safe freeway crossings.

Provide bicycle-activated traffic signal sensors.

The most important issue is safety around schools, parks and the beach.

Bike lanes painted on currently narrow roads would greatly increase safety.

I live in north Leucadia and it is too dangerous to go north or south or west with my family on foot or via bikes.

Bikeway Standards

Encinitas street design manual should make bike lanes standard on arterials.

Many Encinitas bikeway facilities do not meet current standards.

Signage

Use more "Share the Road" signs. However, some drivers interpret these signs to mean that cyclists are supposed to squeeze over to the right and share whatever road space there is, safe or not, at all times. A more useful sign would show a car following behind a cyclist; not side-by-side.

Please install signs while plans for new bike facilities are discussed. We need improvements now – even signs would be a great help.

Larger/more signage alerting motorists.

Education

Driver education is important.

Third priority is instructing the public in bicyclist rights and safety.

Many drivers do not know that cyclists have rights on the road.

Cyclists need to be aware of the "rules of the road" and abide by them.

Maintenance

Sweeping bike lanes is needed.

Clean up the glass shards.

Please keep bike lanes in general in good repair and free of debris.

It would help if the city would mark the "sweet spots" of maximum traffic signal loop detector sensitivity. Even veteran cyclists often have to guess at the best place to stop.

Poor traffic signal loop detector sensitivity: My current pet peeves include Garden View Road at El Camino Real, Garden View Road at Leucadia Boulevard, and the Home Depot/ Encinitas Town Center driveway.

Better maintenance of bike lanes – removal of debris.

Connectivity

Develop a system connecting Encinitas and surrounding cities for commuters.

Connectivity is important.

Connect existing bike lanes.

Connectivity of bike trails and lanes is key to encouraging biking for transportation as well as community education and signage regarding biker right-of-way and sharing the road (for motorists AND bikers).

Multi-Modal Transit Connections

Increase the number of Coaster trains on weekends.

Other

Prioritize bike paths as a cost-effective, energy-efficient alternative to cars so people can ride/walk versus using cars and polluting.

Separate bikeways from motor vehicle traffic as much as possible.

Recreation should be secondary priority.

Include cyclists on the traffic commission.

The Traffic Commission would be more effective if it included geographically at-large representatives of bicycling and pedestrian interests and if it were empowered to act as a within-the-system advocate for citizens who raise traffic safety and access issues.

During a lane closure (due to construction) keep a bike lane open.

As a “serious” transportation and recreation bicyclist, I favor wide curb lanes for prime arterials and other fast, heavily-traveled streets. Where on-street parking is permitted, I dislike bike lanes positioned to imply that we should ride in the “door zone,” instead of at least a meter to the left of the parked cars. This is a genuine public education issue, as the CHP/AAA-sponsored defeat of AB1408, which would have defined the door zone, so dramatically illustrates.

7.2.2 Specific Roadway Locations

Highway 101

Highway 101 needs continuous Class 2 lanes, particularly downtown. Most cyclists are on this route.

Northbound Highway 101 has major root and debris problems.

Prioritize Highway 101 for transportation and sports use.

Highway 101 near Swami’s is incorrectly marked as a bike lane. The separating barrier is made of asphalt and has caused several accidents.

We need to eliminate the asphalt berm on Highway 101.

Highway 101 between Encinitas Boulevard and Marcheta Street is incorrectly marked as a bike lane. This “lane” does not meet recognized standards.

Require contractors to sweep the shoulders of northbound Highway 101 (east side) from Leucadia Boulevard to La Costa Boulevard.

Reduce the number of parking spots on Highway 101.

Coast Highway and Vulcan need dedicated barrier-protected, wide, multi-use bike and walking paths so people can connect to Carlsbad and to the beach without having to drive.

We need (a) bridge over the railroad tracks and Coast Highway at Grandview.

Vulcan Avenue

Roadway width was added along the southern half, but it is not usable due to sloppy uneven asphalt patches. Harassment of cyclists has increased greatly along this stretch of road.

We need wider smoother bike lanes on Vulcan.

Vulcan Avenue definitely needs Class 2 lanes.

I am very impressed that the city spent the money to remove the berm and to rebuild it two feet farther west, thereby restoring some of the shoulder, but it would have been far better to do it right the first time.

Now, if we can only get the debris and sand removed...

Encinitas Boulevard
Encinitas Boulevard bike lane between Vulcan Avenue and Interstate 5 is only four feet wide, including gutter.

We need a bike lane at Encinitas Boulevard and Interstate 5.

Bike lane disappears between Saxony and Interstate 5, forcing us to cross two lanes of traffic to get to the beach.

Manchester Avenue
Manchester Avenue between El Camino Real and Encinitas Boulevard is dangerous due to blind curves and poor road conditions.

Fast traffic entering the Interstate 5 on-ramp makes this a dangerous location. Cyclists have to cross two lanes of traffic to get to the coast.

Rancho Santa Fe Road
Rancho Santa Fe Road needs Class 2 lanes.

El Camino Real
A secondary priority is improving safety on El Camino Real from Leucadia to Encinitas Boulevard with signage.

Westlake Street
The Westlake Street bike lane north of Requeza Street is in poor condition.

San Elijo Avenue
This route is narrow and in bad condition. It needs striping and signs.

Birmingham Drive at Interstate 5
This is a dangerous intersection with two gas stations.

Village Park Way
Provide a Class 2 or 3 bike facility between Rancho Santa Fe Road and Encinitas Boulevard.

Lake Drive
Lake Drive is wide enough for a Class 2 lane, but it has a lot of speeding traffic.

Union Street
Connect Union Street over Interstate 5.

Provide a tunnel under the rail line at Union Street.

Leucadia Boulevard
Westbound curb cuts just west of Interstate 5 make riding dangerous.

El Camino del Norte
Continue the bike lane into San Marcos.

This is a highly used bicycle route. Perhaps Class 2 would be appropriate.

7.2.3 Other Specific Locations

Rail Line

Make this the top (bikeway) priority.

Tunnel under the tracks near Ecke Elementary School to connect to Highway 101.

We need bridge over the railroad tracks and Coast Highway at Grandview

Encinitas Ranch Town Center

This is a major destination for kids and teens, but there is no easy access and no way to safely bike from one store to another.

Mira Costa College

Is there a way to connect Mira Costa College to the Crest Drive area?

Escondido Creek

Create separate bike trail/horse trail through Escondido Creek from Coast Highway 101 at San Elijo Lagoon to Lone Jack Road/Wildflower. Would be a flat east-west connection, no traffic, no lights, would be an incentive to use bikes to go to work or beach on weekends. Trail would eventually be connected to Elfin Forest trail system.

8

Recommendations

Based on the previous chapters of this master plan, this chapter describes bikeway system improvements recommended for the City of Encinitas. The following recommendations are intended to take build on the opportunities presented by existing and programmed roadways and bicycle facilities to resolve cyclists' concerns for safety and connectivity.

Encinitas currently has no Class 1 facilities, but the planned Coastal Rail Trail is considered the primary priority of this bikeway master plan. The segment numbers used in the text descriptions of the proposed bikeways in the following sections are also used in the following chapter (See Chapter 9: CIPs and Bikeway Funding).

The City of Encinitas has a fairly comprehensive system of Class 2 bikeways along its major roadways in the eastern portion of the City. There is only one existing Class 3 route, Coast Highway 101 north of Encinitas Boulevard.

Like most cities, there are gaps in the bikeway system. Potentially important ones include Manchester Avenue between El Camino Real and San Elijo Avenue, Santa Fe Drive between El Camino Real and San Elijo Avenue, Coast Highway 101 along its entire length and Leucadia Boulevard between Interstate 5 and Coast Highway 101. Proposed facilities are intended to address these connectivity gaps. (See Figure 8-1: Existing and Proposed Bikeway Facilities.)

Timely completion of the bikeway system will only be possible through a partnership involving commuting and recreational cyclists, property owners, developers and the City.

8.1 Facility Priority Criteria and Implementation

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. However, the following prioritization criteria can be used to help identify which routes are likely to provide the most benefit to the City bikeway system:

Mobility and Access (total of 20 points)

1. Volume of existing or potential bicycle traffic: 0 – 10 points
2. Provides access to major bicycle traffic generators: 0 – 5 points
3. Closes gap in significant route: 0 – 5 points

Safety (total of 15 points)

4. Remedies or improves specific obstacles: 0 – 5 points
5. Improves locations where bicycle crashes have occurred: 0 – 5 points
6. Improves routes with high vehicular traffic volumes: 0 – 5 points

Ability to Implement (total of 10 points)

7. Route or project has full or partial funding, or is likely to be funded: 0 – 5 points
8. Route or project is contained in a specific plan: 0 – 5 points

The maximum possible score is 45 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.

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, the lower cost project can be placed ahead of the higher cost project.

8.2 Proposed Bikeway Facilities

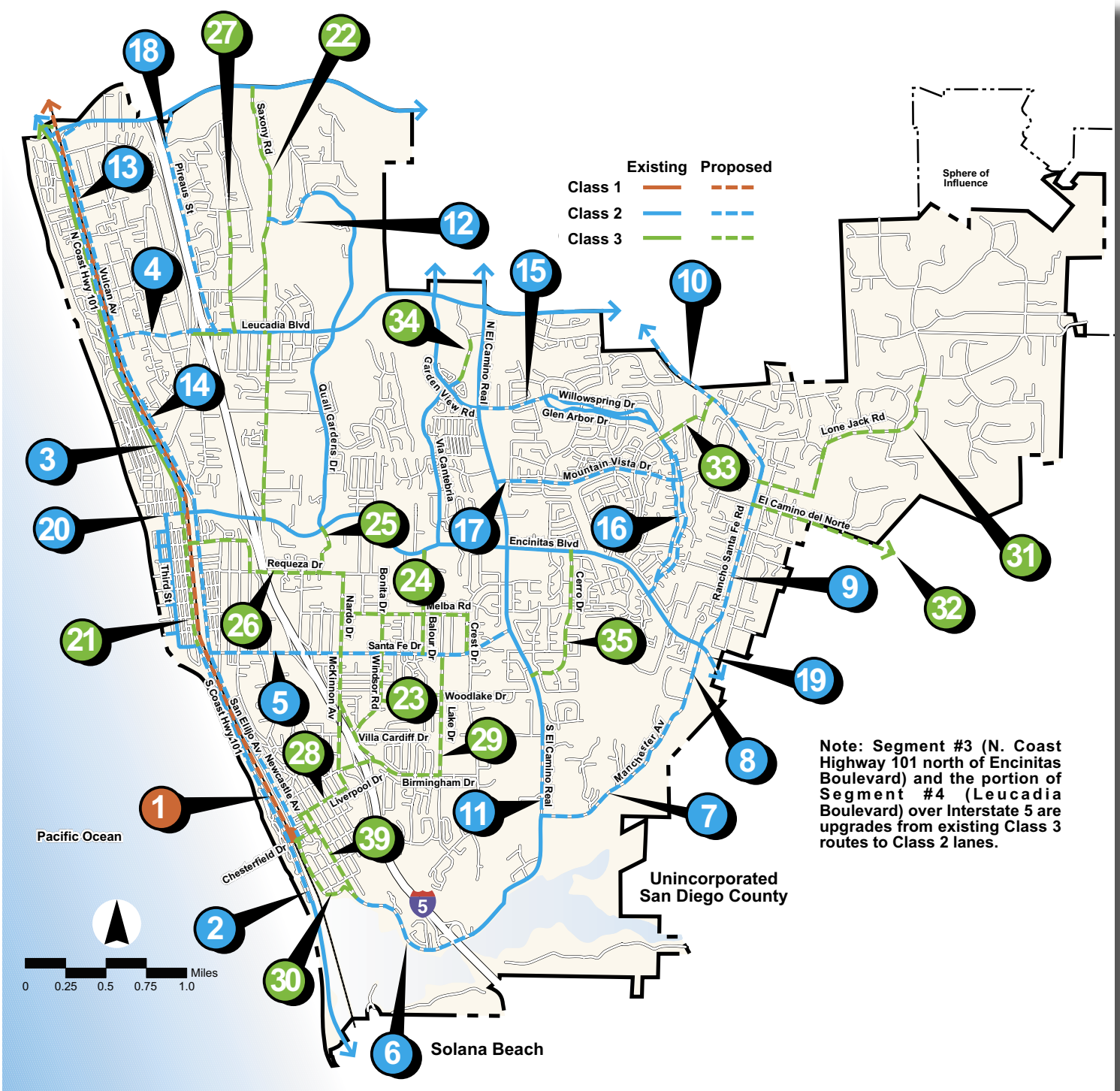
The existing bikeway system mapping was derived from SANDAG's regional bikeway GIS data, the 1990 City of Encinitas Bikeway Master Plan and Engineering Feasibility Study, review of specific plans, community input and extensive field analysis. (See Figure 9-1: Proposed Bikeway System.) The proposed facilities shown in Figure 8-1 represent all three types of proposed bikeways. The following text sections describe the proposed bikeways in more detail.

8.2.1 Class 1 Facilities (CIP Segment 1 only)

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. Total proposed Class 1 mileage in the update is 3.74 miles.

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.

Figure 8-1: Existing and Proposed Bikeway Facilities



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 m.p.h. Speed limits may also be implemented and are generally 15 m.p.h.

The opportunity exists for the installation of a Class 1 facility that would not only provide the relaxed recreational atmosphere associated with an off-street facility, but could also improve commuter connections. The Class 1 route proposed in Figure 8-1 would be designed for multipurpose use. The paths should be wide enough (10 feet minimum) to accommodate multiple user types and should include an unpaved side path (2 to 4 feet) for users who prefer a softer trail. (See Figure 8-1: Existing and Proposed Bikeway Facilities.)

Segment 1 - Coastal Rail Trail
Completion of the Class 1 portions of the Coastal Rail Trail along the entire length of the City of Encinitas between the Cities of Carlsbad and Solana Beach would be a boon to local and regional cyclists. The facility will be a paved, multi-use, regional route connecting the coastal cities of San Diego County within the rights-of-way of the existing rail line and within roadways where the rail line access does not exist, such as over lagoons.

8.2.2 Class 2 Facilities (CIP Segments 2-21)

Class 2 bikeways (often called bike lanes) are one-way facilities within roadways 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 eastern portion of the City of Encinitas east of Interstate 5. 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. Total proposed Class 2 mileage in this update is 21.04 miles.

Segment 2 - Coast Highway 101 between K Street and Cardiff State Beach
This segment upgrades the southernmost section of Coast Highway 101, which is made up of an unorganized arrangement of official and “unofficial” bikeway facilities. This is the only bikeway connection between Encinitas and Solana Beach.

Segment 3 - Coast Highway 101 between D Street and La Costa Avenue
This segment upgrades the northern section of Coast Highway 101 from a Class 3 route to a Class 2 lane. This is a very heavily used bicycling route, for commuting, recreation and training. This Class 2 installation is also called for in the North 101 Corridor Specific Plan.

Segment 4 - Leucadia Boulevard between Coast Highway 101 and Urania Avenue
This segment upgrades a currently undesignated route to a Class 2 lane. This is a fairly heavily used route over Interstate 5 between eastern Encinitas and Carlsbad and coastal Encinitas. It is also intended to improve access to a proposed Urania Avenue Class 3 route to serve a “Safe Routes to School” function for Capri Elementary School.

Segment 5 - Santa Fe Drive between El Camino Real and San Elijo Avenue
This segment is an upgrade of an east-west roadway connecting east central Encinitas under Interstate 5 with downtown coastal Encinitas. A high school lies near the center of this segment and it also serves a hospital and retail center just west of Interstate 5.

Segment 6 - Manchester Avenue between Sam Elijo Avenue and Interstate 5
This is one of three segments of Manchester Avenue, but the only one west of Interstate 5. This is a fairly well used route connecting southeastern and coastal sections of Encinitas under Interstate 5. It would also provide a Class 2 access between the coastal areas and Mira Costa College, which lies on the only section of Manchester Avenue that currently has Class 2 facilities. This is a scenic route.

Segment 7 - Manchester Avenue between El Camino Real and Trabert Ranch Road
This segment is the second of three on Manchester Avenue and a continuation of an existing Class 2 segment just east of Class 2. It will likely require right-of-way acquisition due to limited roadway width and road widening will require significant grading due to local topography. It is part of a popular and scenic cycling route.

Segment 8 - Manchester Avenue between Trabert Ranch Road and Encinitas Boulevard
This segment is the third of three Class 2 segments proposed for Manchester Avenue. It connects to an existing Class 2 lane on Encinitas Boulevard and access to a retail center. It is part of a popular cycling route.

Segment 9 - Rancho Santa Fe Road between Encinitas Boulevard and El Camino del Norte
This segment provides a connection between existing Class 2 lanes on Encinitas Boulevard and a short existing Class 2 segment on Rancho Santa Fe Road north of El Camino del Norte. It would be part of an overall route connecting Carlsbad to eastern Encinitas. It is a popular cycling route.

Segment 10 - Rancho Santa Fe Road between Calle Santa Catalina and City of Carlsbad boundary
This segment would complete a route connecting Carlsbad and eastern Encinitas with coastal Encinitas. The northern end of this segment comes very close to Leucadia Boulevard (Olivenhain Road in Carlsbad) and would provide another connection to coastal Encinitas from eastern Encinitas and Carlsbad.

Segment 11 - El Camino Real between Manchester Avenue and Tennis Club Drive
This is the sole remaining segment of El Camino Real that does not have Class 2 lanes in place.

Segment 12 - Quail Hollow Drive between Saxony Road and Swallowtail Road
This is a short continuation of Quail Gardens Drive that otherwise has Class 2 lanes in place as part of recent construction.

Segment 13 - Vulcan Avenue/San Elijo Avenue between Chesterfield Drive and Leucadia Boulevard
Vulcan Avenue is a popular north-south route for cyclists who would prefer not ride on busier Coast Highway 101. This segment is the subject of an ongoing bicycle and pedestrian study and noted in the North 101 Corridor and Downtown Encinitas Specific Plans.

Segment 14 - Vulcan Avenue Between Leucadia Boulevard and La Costa Avenue
This is the northern portion of a popular north-south route and included in a specific plan.

Segment 15 - Gardenview Road between El Camino Real and Willowspring Drive/Glen Arbor Drive
This segment would complete a connection between El Camino Real and the residential areas around Willowspring Drive and Glen Arbor Drive. The latter two streets are one-way couplets.

Segment 16 - Willowspring Drive/Glen Arbor Drive between Encinitas Boulevard and Village Park Way
Class 2 lanes already exist on a significant portion of these two one-way couplet streets. This segment would complete this route and provide a connection between El Camino Real and Encinitas Boulevard through this large residential area.

Segment 17 - Mountain Vista Drive between El Camino Real and Willowspring Drive
This segment would provide a connection between El Camino Real and the Willowspring Drive/Arbor Drive couplet through a large residential area.

Segment 18 - Piraeus Street between Leucadia Boulevard and La Costa Avenue
This segment would provide another north-south connection between Carlsbad and La Costa Avenue and Leucadia Boulevard. Currently, none exists east of Coast Highway 101.

Segment 19 - Encinitas Boulevard/Rancho Santa Fe Road to San Diego County
Along with a small section (CIP Segment 20) at the far west end west of Coast Highway 101, this segment would complete the Class 2 lane on Encinitas Boulevard and continuing on Rancho Santa Fe Road east of Encinitas Boulevard. This segment would provide a connection to County facilities east of the City of Encinitas.

Segment 20 - Encinitas Boulevard/B Street between Interstate 5 and Third Street
This is a small section of Encinitas Boulevard west of Coast Highway 101 that would connect with the existing Class 2 lanes on Third Street. This would provide a connection to coastal and downtown Encinitas from east of Interstate 5.

Segment 21 - Saxony Road between La Costa Avenue and Quail Gardens Drive
This section of Saxony Road would connect with existing and proposed Class 2 lanes on Quail Gardens Drive. This would provide a connection between Encinitas Boulevard and La Costa Avenue east of Interstate 5.

8.2.3 Class 3 Facilities (CIP Segments 22-39)

Class 3 routes are within the vehicular right-of-way, but delineated by directional signage only. 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. Several Class 3 routes are proposed in this update, totally 16.61 miles.

Segment 22 - Coast Highway 101 between K Street and D Street
Coast Highway 101 has limited roadway width, high levels of motor vehicle traffic and angle parking. Class 2 bike lanes are available on nearby Third Street as an alternate parallel route to avoid the problems of riding on Highway 101.

Segment 23 - Windsor Road/Villa Cardiff Drive/Woodlake Drive
Parts of these three streets are proposed as Class 3 routes primarily serving Ada Harris Elementary School as “Safe Routes to School” as well as park access.

Segment 24 - Balour Drive/Bonita Drive/Crest Drive/Melba Road/Nardo Road
Portions of these five streets north of Santa Fe Drive are proposed as Class 3 routes primarily serving San Dieguito Academy, Ocean Knoll Elementary and Oakcrest Junior High Schools as “Safe Routes to School.”

Segment 25 - Westlake Street
This route is the southern continuation of the Quail Gardens Drive Class 2 lane across Encinitas Boulevard.

Segment 26 - D Street/Stratford Drive/Requeza Street
This route connects central and downtown coastal Encinitas via a safe crossing of Interstate 5 using the Requeza Street bridge. This route is intended to take advantage of a freeway crossing that is not at an interchange and experiences low motor vehicle traffic volumes.

Segment 27 - Urania Avenue
This is a Class 3 route serving Capri Elementary School as a safe route to school.

Segment 28 - Chesterfield Drive/Newcastle Avenue/Liverpool Drive/Mackinnon Avenue
These are an alignment of parts of four streets proposed as a Class 3 route connecting coastal Cardiff and central Encinitas east of Interstate 5, including connection to the future park at the Hall property.

Segment 29 - Birmingham Drive and Lake Drive
These two streets together form a proposed Class 3 route serving Ada Harris Elementary School and Park, Cardiff Sports Park, and a park and ride lot. This route connects coastal Cardiff and central Encinitas east of Interstate 5.

Segment 30 - San Elijo Avenue between Manchester Avenue and Chesterfield Drive
This Class 3 segment is a continuation of Segment 6 (Manchester Avenue) and completes a route connecting Carlsbad and eastern Encinitas with coastal Encinitas. This segment is proposed as a Class 3 primarily due to limited rights-of-way. This is a popular cycling route.

Segment 31 - Lone Jack Road between Rancho Santa Fe Road and Fortuna Ranch Road
This segment would provide a connection between Rancho Santa Fe Road and central Olivenhain immediately to the east that is served by this route only.

Segment 32 - El Camino del Norte between Rancho Santa Fe Road and County of San Diego boundary
This segment would provide a connection to County facilities east of the City of Encinitas. This is one of only two connecting routes with unincorporated County land east of Encinitas.

Segment 33 - Village Park Way/Morning Sun Drive
This Class 3 route primarily serves Diegueno Junior High School, but also provides a neighborhood connection between Encinitas Boulevard and Rancho Santa Fe Road. This route is not contiguous. A short section does not yet exist between Morning Sun Drive and Village Park Way.

Segment 34 - Via Cantebria between Garden View Road and Town Center Drive
This route is a continuation of an existing Class 2 lane that currently ends just north of Garden View Road. It would connect this Class 2 lane with Leo Mullens Sports Park and a retail center.

Segment 35 - Cerro Drive
This route would provide a safer alternative to going through the intersection of Encinitas Boulevard and El Camino Real.

Segment 36 - Requeza Street/East F Street between Stratford Drive and Vulcan Avenue
This route would provide an direct alternate connection between and central Encinitas and Vulcan Avenue.

Segment 37 - Second Street between D and K Streets
This route would provide an alternative to riding through downtown Encinitas on Coast Highway 101.

Segment 38 - Saxony Road between Quail Hollow Drive and Encinitas Boulevard
This route would provide a north-south route between La Costa Avenue and Encinitas Boulevard east of Interstate 5.

CIP Segment 39 – Manchester Avenue between San Elijo Avenue and Liverpool Drive and Chesterfield Avenue between Manchester Avenue and Newcastle Avenue
Particularly for less experienced cyclists, this route would provide an alternative connection between Manchester and Chesterfield Avenues that avoids a narrow and fairly steep portion of San Elijo Avenue to the west that is part of Segment 30.

8.3 Other Facility Improvement Recommendations

Many of the current constraints to cycling are physical, but there are other issues that may make some cyclists ride less and others not at all. Implementation of the specific bikeway facility segment recommendations listed above is intended to provide a comprehensive bikeway system that serves the entire City. However, there are other broader issues that affect bikeway system development and connectivity in Encinitas that need to be addressed. The following sections describe recommendations that should be implemented in conjunction with associated bikeway segments.

8.3.1 Freeway and Rail Line Crossings

Most of Encinitas is served by a logical system of arterial roadways befitting the local topography, both in the hilly eastern portion and the flatter western portion of the City. As new development occurs, especially in the eastern area, this arterial pattern is expected to continue. City policy is to include Class 2 bikeway facilities on all major roadways. Experienced and commuter cyclists will welcome these routes.

However, like many cities, the interstate highways present significant problems in terms of connectivity. The distances between crossing points forces cyclists to plan east/west trips based on their locations. Even then, where underpasses and overpasses do provide access, the roadway is often narrow and cyclists using it are confronted with motor vehicles making their way to and from high speed vehicular off and on-ramps, often multi-lane. Not all of Encinitas' interstate crossings have bikeway facilities. Like other issues, this was originally brought to light in questionnaire respondent comments and reviewed during field work.

Caltrans District 11 (San Diego) no longer allows high-speed free right turns at interchanges. The Caltrans Highway Design Manual also generally discourages such turns because their primary purpose, high motor vehicle capacity, is usually defeated by additional controls required to enhance safety such as yield signs, stop signs or signal controls.

"**Share the Road**" signs are strongly recommended at freeway interchanges with or without bicycle facilities to warn motorists that they should expect to encounter cyclists. (See Section 10.2.12.)

Any proposed free right turns should be redesigned as 90 degree turns.

Interstate 5

There are eight Interstate 5 crossings within Encinitas at intervals of roughly half a mile. Six are typical interchange under- or overcrossings, some with dual on- and off-ramps:

- La Costa Avenue (within City of Carlsbad): Existing Class 2 overcrossing
- Leucadia Boulevard: Proposed Class 2 overcrossing
- Encinitas Boulevard: Existing Class 2 undercrossing
- Santa Fe Drive: Proposed Class 2 undercrossing
- Birmingham Drive: Proposed overcrossing
- Manchester Avenue: Proposed Class 2 undercrossing

At the interstate freeway crossings, marked bicycle lanes should be carved out of the left side of any wide right-turn-only lanes leading to freeway on-ramps. This will calm right-turning

traffic, improve pedestrian and cyclist safety, and will notify motorists that bicyclists positioning themselves between the through and the right-turn-only lanes (instead of between the right-turn-only lane and the curb) are riding legally, safely, and properly, and should be anticipated and accommodated. This new section of bike lane should align with any existing lanes crossing the freeway on the far side of the intersection. In general, at augmented intersections, the rightmost through lane should be wide and the right-turn-only lane should be as narrow as possible. (A good recent example is the eastbound Leucadia Boulevard on-ramp to southbound Interstate 5.)

There are two freeway crossings of Interstate 5 without on- or off-ramps:

- Requeza Street: Proposed Class 3 overcrossing
- Mackinnon Street: Proposed Class 3 overcrossing

Freeway crossings without on- and off-ramps are undoubtedly preferred crossing locations for all cyclists, experienced or not. They provide safer crossings than typical interchanges because there are far fewer motor vehicle turning movements and far less vehicle traffic overall than at typical interchanges. However, though they provide an opportunity to avoid typical interchange traffic conditions, they can take cyclists well away from their intended route of travel. They often fall far enough apart that they are not always convenient to cyclists.

Rail Line

There are five relatively widely spaced rail line crossings with spans of more than a mile between some of them:

- La Costa Avenue (within City of Carlsbad): Existing Class 2 overcrossing
- Leucadia Boulevard: Proposed Class 2 at-grade crossing
- D Street: Proposed Class 3 at-grade crossing
- Chesterfield Drive: Proposed Class 3 at-grade crossing
- Encinitas Boulevard: Existing Class 2 undercrossing

Undercrossings are seriously being considered at Santa Fe and Montgomery Avenues in Cardiff-by-the-Sea, and near Paul Ecke Central Elementary School in Leucadia. (Source: City of Encinitas) Questionnaire and community meeting comments suggested two crossings. One is already under consideration that would connect Paul Ecke Central Elementary School with Coast Highway 101. The second suggestion was an overcrossing of the rail line and highway to connect north coastal Encinitas and Vulcan Avenue.

8.3.2 Intermodal Facilities

TEA-21 encouraged states and metropolitan areas to develop innovative transportation plans and programs that better integrate public transit, bicycle facilities, and other modes of travel into the existing transportation system. The goal of this multimodal planning is to provide travelers with a real choice of travel options. Increased investment in transit and bicycle facilities can also help meet goals for cleaner, healthier air; less congested roadways and more livable communities.

Used individually, bicycling and transit provide low-cost mobility and place fewer demands on local roads and highways to carry everyday trips. Used in combination, bicycles and public transportation provide enhanced access to work, shopping and services. For this bikeway master plan, intermodal facilities included bus stops, commuter rail stations, transit centers and park and ride lots. All buses and trains currently provide bicycle service. However, use appears to be minimal.

The existing intermodal facility system currently provides a reasonable level of connection between cycling and mass transit. Any new facilities should continue to provide the capability to take bicycles on board vehicles, either using exterior racks or inside the vehicles, and to continue to provide cyclists the choice to store them at transit centers, such as in lockers. Improvements to the system may encourage more people to use their bicycles and the mass transit system for commuting purposes. These improvements can include the following:

- Increased availability of bicycle racks and lockers;
- Upgrading condition bicycle facilities connecting to stations;
- Information kiosks, trailblazer signs or additional directional information;
- More linkages between stations and surrounding neighborhoods;
- Improve aesthetics along bicycle routes;
- Traffic calming improvements along connecting routes;
- Adequate lighting in and around stations; and
- Monitoring traffic conditions such as traffic volumes and speed, lane widths, surface conditions, parking, bridges, traffic mix, and related considerations on connecting routes and around the station.

Even seemingly small bikeway system enhancements may encourage more people to use their bicycles and connect with transit. Improvements to access routes can include additional bikeway facilities and connections, intersection improvements such as bicycle loop detectors, bicycle parking facilities such racks and lockers and even traffic calming in the station areas. For example, the City of Encinitas has recently taken such a step by removing the high speed turn lane from northbound Vulcan Avenue to eastbound Encinitas Boulevard and reconfiguring it as a conventional intersection.

In addition to installing additional bicycle lockers, the commuter rail station could provide a facility housing other services such as showers and clothes lockers, bicycle repair services and secure, weather-proof bicycle storage for commuting cyclists. Though a fairly new idea for this country, bicycle parking structures are common in large European and Japanese cities where as many as tens of thousands of bikes are parked in double tiers to maximize space, Similar “bikestations” are found at transit centers in some larger American cities, especially those served by commuter rail. Economy of scale keeps costs down since these bike stations require attendants. (For more information, see http://www.bikestation.org/.)

The threshold for whether this is feasible for any governmental entity like a transit board is when the demand for bike lockers at a commuter rail station, for example, outpaces available space. Once a threshold is reached in locker space, use of a bikestation building may make sense because it would free up space by eliminating the need for lockers. However, there would be an ongoing cost for an on-site attendant, while lockers can be accessed at any time by users directly.

If demand supported a bikestation, the obvious location would be the downtown transit center, if government sponsored, or in downtown itself, if privately sponsored. There are examples of private development finding a solution to downtown parking problems by providing bicycle parking facilities. If there is a parking problem downtown, the business improvement district could consider a similar scheme. Since the transit station is also in downtown, there may be a nexus of opportunity between the private and public sectors.

The lack of secure bicycle parking at the park and ride lots may be preventing some commuters from using their bikes to connect with other carpoolers. These park and ride facilities need to be accessible to cyclists and should be equipped with bicycle lockers. A pilot program could be initiated, with adequate publicity, to determine whether there is demand for bicycle parking at the park and ride lots that is not currently being met.

8.3.3 Bridges

Some questionnaire respondents noted narrow bridges as a problem in Encinitas. A general improvement to the Class 2 facilities is the provision of more roadway width on freeway bridges and underpasses. It is common to find that the bikeway facility ends prior to the roadway segment crossing a bridge or underpass and sometimes to have the curb pinch inward, eliminating the previously available space for cyclists. In addition, some bridges have high curbs that could potentially catch a cyclist's pedals, especially if the cyclist was attempting to stay far to the right to avoid the motor vehicles on a narrow bridge.

In general, there are a number of solutions short of the ideal, which would be to actually widen the bridges or underpasses. In some cases, the lanes could be re-striped, the sidewalk width decreased or a lane of traffic eliminated. In other situations where the motor vehicle volumes and turning movements are particularly heavy enough to create difficult cycling situations, alternative routes can be provided. In most cases in Encinitas, there are alternate interstate crossing points within half a mile.

8.3.4 High Motor Vehicle Speeds and Volumes

Many of Encinitas' existing Class 2 bikeway facilities are on arterial roadways with relatively high posted motor vehicle speeds and high volumes. This is likely to continue as new routes are implemented. Experienced cyclists are generally not concerned with adjacent motor vehicle speeds, especially when they can rely on the relative safety of their own Class 2 lane or a wide curb lane. However, less experienced cyclists are more likely to find such conditions uncomfortable and may be less likely to use these high speed roadways. They may instead ride on adjacent sidewalks, which is contrary to the state vehicle code and discouraged by Caltrans. Alternate routes have been recommended wherever possible, especially where such routes can provide inexperienced cyclists a way to avoid high volume, high speed arterial intersections.

8.3.5 Urban Access Pathways

In some cases, opportunities to increase intermodal transit use may be available simply by providing convenient access between transit centers and bikeways where none yet exists. Where these urban access paths may prove useful, they would require development of multi-use pathways for non-motorized use because they would naturally attract pedestrian use as well. Therefore, multi-use standards should be implemented in the design of these access paths. The Coastal Rail Trail will serve this function by providing a direct access to the commuter rail station from any point along coastal Encinitas.

8.3.6 Connections to Urban Centers

Among the criteria used in the selection of routes for this bikeway master plan was the definition of activity and employment centers, as well as GIS evaluation of population and employment densities. These types of data probably best represent what could be called "urban centers." Using this data, new bikeway routes were evaluated to provide the most direct connections possible between these urban centers, existing transit centers and neighborhoods. In many cases, existing bikeways already ran adjacent to downtown, or an adjacent roadway was determined to be a candidate route. Examples include the Class 3 routes proposed for Requeza Street and Mackinnon Avenue. Both of these routes take advantage of roadway crossings over Interstate 5 unencumbered by freeway on- or off-ramps to connect residential areas east of Interstate 5 with the more urban areas of downtown Encinitas and Cardiff.

8.3.7 School Access Paths/Routes

In most cases, some students at any particular school will get there by bicycle. Many of these children are not experienced, knowledgeable or comfortable with riding on streets in the midst of motor vehicle traffic. For them, alternate routes should be designated to access schools from the surrounding neighborhoods they serve. These routes would utilize lightly traveled streets where riding would be unlikely to pose safety problems for themselves or

other users. These routes should also be designed to cross arterials or other high volume streets, when necessary, at specific points with sufficient sight distances, crosswalks, pedestrian signals and, where appropriate, crossing guards. The students for whom these routes are designated should be encouraged to use them. (See Appendix C: Guidelines for Selecting Safe Routes to School.)

8.3.8 Loss or Degradation of Bikeway Facilities

It should be any city's policy to maintain existing bicycle facilities, both in terms of continuity and pavement quality. However, Class 2 bikeways are inadvertently lost or degraded in two ways. First, they are lost when lanes are re-striped. This usually occurs at intersections when additional motor vehicle turn lanes are added and the additional space is taken partly from the former bike lane. In the second case, bike lanes are degraded and effectively lost when bikeways are not carefully resurfaced and re-striped following roadway and utility repairs. The result is rough, piecemeal or even, over time, nonexistent bike lanes.

In both cases, City planning and traffic engineering officials should make certain that roadway alterations are well thought out and that comprehensive resurfacing requirements are fulfilled and bikeway facilities retained or restored before projects are considered complete and contractors' bonds released.

8.3.9 Temporary Construction Zone Speed Limits

Post and enforce a reduced speed limit when construction activity obliterates a bike lane or narrows a lane otherwise wide enough for safe side-by-side motor vehicle and bicycle sharing, A "Share the Road" sign with a bicycle-and-car graphic is also recommended in such situations. (See Section 10.2.12.)

8.3.10 Traffic Signal Loop Detector Sensitivity

Workshop attendees and questionnaire respondents commented that not all signal loop detectors regularly detected bicycles and that even veteran cyclists often have to guess at the best place to stop to activate the signal. The City should calibrate all traffic signal loop detectors to detect bicycles and mark the "sweet spot" of maximum sensitivity with an easily recognizable symbol.

8.3.11 Topography

Most arterial roadway segments in the eastern part of the City have gentle grades, but areas of relatively steep or long grades exist because they cut across the ridges and dividing canyons. Though a small percentage of cyclists may actually seek out such routes, most would rather avoid them. Little can be done to alleviate this problem except to provide alternative routes to circumvent steep areas wherever possible. Even this may be difficult, since parallel routes may take the cyclist well outside his or her way. Such alternate routes have been recommended wherever possible.

8.4 Related Recommendations

Besides physical improvements, there are a number of measures that can improve conditions in Encinitas. Among them are cyclist and motorist education, enforcement and bikeway maps, which are discussed in the following sections.

8.4.1 Education

The incredibly low percentage of children getting to school by bike may simply be symptomatic of the overall decrease in physical activity, widespread dietary changes and more dispersed land use configurations over the last few decades. Parents also apparently no longer feel safe allowing their school age children to travel to and from school alone. A solution to this problem is beyond the scope of this update, but the situation does not bode well for the percentage of older children and adults who can be expected to use bicycles

in the near future. Perhaps a Safe Routes to School program with parental involvement may help to encourage more bicycle use. (See Appendix C: Guidelines for Selecting Safe Routes to School.)

No matter how good conditions are for bicycling in any community, cyclists and motorists need to know how to safely interact with each other on the roads. Education is the key to making a bikeway system safer.

In general, bicycle education programs either develop awareness and provide information, such as posters, brochures and videos, or they attempt to change behavior and/or develop skills, such as on-bike instruction. Programs can take many forms including hands-on riding instruction for adults and children, curriculum for adults who supervise children (i.e. teachers, day care persons), public awareness programs aimed at the whole community, instruction for motorists, law enforcement and community events.

Many cyclists lack the basic skills or knowledge to safely ride in traffic. Bicycle education programs are designed to increase bicycle safety by improving the ability to ride with traffic and heighten motorist awareness. The difficulties faced in helping people develop this skill and knowledge stems from the wide range of age groups that require this training and the necessity to tailor the programs to each one.

Young children should be taught the basic rules of the road in conjunction with hands-on cycling instruction. Programs directed at children are best handled by the schools or day care centers. Programs aimed at adults typically only reach those that are interested in learning about cycling. Motorist-oriented programs generally reach their intended audience at specific points, such as during driver's training courses, driver's licensing exams and traffic school courses for violators.

Public awareness campaigns are most useful for educating the motorist on how to safely share the road with bicyclists and overall awareness of bicyclists' rights and responsibilities. Media campaigns using bumper stickers and banners can be developed. Community events and family activities can be used to raise awareness of bicycle/motorist safety. Parents who attend bicycle education events with their children may themselves learn something about bicycle/motorist safety.

The City could make use of public service space from newspapers, television, radio, bus advertising, posters and flyers mailed in utility bills. The City should consider including an educational flyer in mailings to residents.

Any public education program should emphasize the following points of "bike etiquette":

- Reckless/negligent uses of all bikeway facilities is prohibited. All users shall ride at a safe, controlled speed and in a responsible manner.
- Control your bicycle. Be alert and attentive.
- Keep to the right.
- Pick up litter, even if it's not yours.
- Respect closures and do not trespass on private property. Obey all directional and instructional signs.
- Helmets are required for minors and are recommended for all users. .
- Cyclists shall yield to pedestrians. Be aware and considerate of cyclists and pedestrians.
- Make your approach known well in advance. A friendly greeting is considerate and works well. A bicycle bell is also effective. Avoid startling others. Respect others by slowing down when passing.

- Anticipate that other cyclists or pedestrians may be around corners or in blind spots. (Source: City of Encinitas)

The Federal Highway Administration's (FHWA) Bicycle Safety Education Resource Center (http://www.bicyclinginfo.org/ee/fhwa.html) is an excellent place to start to develop education programs.

Signage on roadways, such as "Share the Road" signs also serve as an educational tool that alerts motorists to the presence of bicyclists. (See Section 10.2.12.)

8.4.2 Enforcement

Bicycle safety education and promotion programs will hopefully reduce the need for heavy investments in enforcement. Even so, the Sheriffs Department must enforce traffic regulations for both children and adult cyclists, and motorists. When there is conflict, there must also be reliable, consistent enforcement of traffic laws to ensure bad behavior is punished or corrected.

Officers are sometimes hesitant to cite bicycle offenders, especially children. This leaves some cyclists are under the impression that they can do whatever they want while on a bicycle. However, cyclists who are unpredictable by typical driving standards are a hazard. Therefore, enforcement should be viewed as another component of a bicycle education program and as an effective way to reduce the number of bicycle accidents and injuries.

Posted speed limits should be enforced. High motor vehicle speeds make cyclists feel unsafe, discourage people from cycling, and increase the severity of collisions.

Officers and departments need to be convinced that enforcing traffic regulations for bicyclists is a good idea. Officers may also need some education on the laws regarding bicyclists' rights and responsibilities, on how best to approach the bicyclist offender, and on what offenses to earmark for enforcement. Any bicycle enforcement program should start first with a citation alternative program and warnings, and then move to giving citations.

8.4.3 Bikeway Map

There is a regional bikeway facility map available through SANDAG, but workshop participants and questionnaire respondents asked about the availability of a City bikeway system map. The City can accommodate these requests and further encourage bicycle use by providing such a map. This map can be developed from the information provided in this bikeway master plan and updated as new facilities are implemented. This map can be distributed through local bicycle shops, schools, transit centers, and City and other governmental offices. It can also be downloadable from the City web site.

9

CIPs and Bikeway Funding

The following sections define the recommended bikeway system improvements as CIP projects and provide construction costs. See Figure 9-1: Proposed CIP Project Segments, for a graphic overview of the proposed bikeway segments. For general bikeway component construction costs, see Table 9-1: Typical Unit Construction Costs. For a brief description of each segment, including estimated costs and segment lengths, see Table 9-2a and 9-2b: Capital Improvement Projects. See Chapter 8 for more detailed text descriptions. The remaining sections of this chapter describe the funding sources available for bikeway projects, followed by a summary, Tables 9-3A and B: Bikeway Facility Funding Summary.

9.1 Bikeway Development Priorities

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 timeline, since the availability of funds for implementation is variable and tied to the priority of the City's capital projects. (See Section 8.1: Facility Priority Criteria and Implementation.)

Note that the segment numbering sequence lists the sole Class 1 facility (Coastal Rail Trail) first, followed by the proposed Class 2 facilities and the Class 3 facilities last. This represents a rough approximation of the recommended prioritization within facility classes only, not an overall prioritization of bikeway facility segments. 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 2 and 3 facilities be regarded as parallel lists and be implemented as appropriate funds become available for each type of facility. (See Table 9-2a and 9-2b: Capital Improvement Projects, for more information.) Additionally, facility prioritization criteria identified in Section 8.1 ca be used to help identify which bikeways are likely to provide the most benefit to the bikeway system user.

9.2 Typical Unit Construction Costs

Bikeway facility construction costs vary widely depending on facility type. A list of typical unit construction costs in 2004 dollars are shown in Table 9-1. 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 metropolitan region.

9.2.1 Class 1 Bikeways

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 across flat terrain roadbed will require far less grubbing, grading and structural enhancements than a facility being constructed through an undeveloped area with hilly topography. The cost used in Table 9-2 was $326 per linear foot, or approximately $1,722,507 per mile, due to extensive construction, grading, bridges and environmental review. (Source: City of Encinitas.)

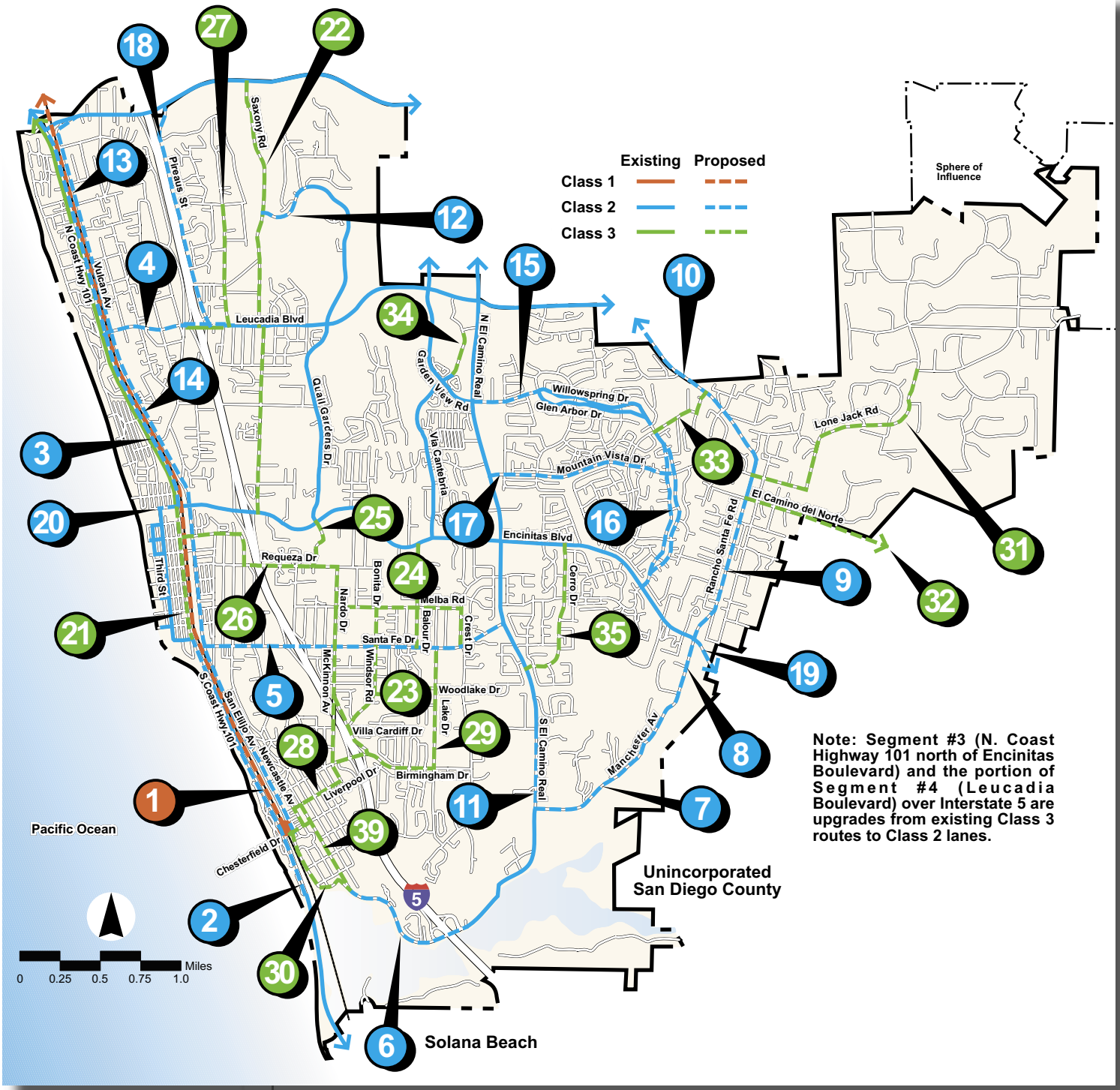
Table 9-1: Typical Unit Construction Costs

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 Signing	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: Recent San Diego County projects (Kimley-Horn and Associates, Inc.)

Figure 9-1: Proposed CIP Project Segments



Red = Class 1 Path
Blue = Class 2 Lane
Green = Class 3 Route

Table 9-2a: Capital Improvement Projects

Segments Numbers	Feet	Miles	Description	Est. Costs*	Notes
Class 1 Facilties					
1	19,747	**3.74**	Coastal Rail Trail	$6,441,784	Regional rail trail generally located along railroad tracks between Coast Highway 101 and Vulcan/San Elijo Avenues.
Total:	**19,747**	**3.74**		**$6,441,784**	
Class 2 Facilties					
2	9,149	**1.73**	Coast Highway 101 between K Street and Cardiff State Beach	$54,894	Coastal connection between Solana Beach and downtown Encinitas - install "Share the Road" signs
3	14,171	**2.68**	Coast Highway 101 between D Street and La Costa Avenue	$85,026	Upgrade from Class 3 to 2
4	4,195	**0.79**	Leucadia Boulevard between Coast Highway 101 and Urania Avenue	$25,170	Popular cycling route connecting eastern and coastal Encinitas - Class 3 to 2 upgrade over I-5
5	10,002	**1.89**	Santa Fe Drive between El Camino Real and San Elijo Avenue	$60,012	High school and retail center access
6	5,224	**0.99**	Manchester Avenue between San Elijo Avenue and Interstate 5	$31,344	Popular cycling route
7	4,981	**0.94**	Manchester Avenue between El Camino Real and Trabert Ranch Road	$29,886	Popular cycling route
8	3,405	**0.64**	Manchester Avenue between Trabert Ranch Road and Encinitas Boulevard	$20,430	Popular cycling route and retail center access
9	4,999	**0.95**	Rancho Santa Fe Road between Encinitas Boulevard and El Camino del Norte	$29,994	Popular cycling route
10	3,187	**0.60**	Rancho Santa Fe Road between Calle Santa Catalina and City of Carlsbad boundary	$19,122	Connection with Carlsbad
11	2,632	**0.50**	El Camino Real between Manchester Avenue and Tennis Club Drive	$15,792	Completion of El Camino Real Class 2
12	1,824	**0.35**	Quail Hollow Drive between Saxony Road and Swallowtail Road	$10,944	Completion of Quail Gardens Road Class 2
13	17,717	**3.36**	Vulcan Avenue/San Elijo Avenue between Chesterfield Drive and Leucadia Boulevard	$106,302	Less traveled alternate coastal Class 2 route
14	7,008	**1.33**	Vulcan Avenue Between Leucadia Boulevard and La Costa Avenue	$42,048	Less traveled alternate oastal Class 2 route
15	2,222	**0.42**	Gardenview Road between El Camino Real and Willowspring Drive/Glen Arbor Drive	$13,332	Connection to El Camino Real
16	5,792	**1.10**	Willowspring Drive/Glen Arbor Drive between Encinitas Boulevard and Village Park Way	$34,752	Completion of Class 2 connection
17	6,200	**1.17**	Mountain Vista Drive between El Camino Real and Willowspring Drive	$37,200	Class 2 serving large residential area
18	7,449	**1.41**	Piraeus Street between Leucadia Boulevard and La Costa Avenue	$44,694	North-south connector route
19	1,020	**0.19**	Encinitas Boulevard from Rancho Santa Fe Road/Manchester Avenue to County of San Diego	$6,120	Connector with County of San Diego route
20	2,436	**0.46**	Encinitas Boulevard from Interstate 5 to Third Street	$14,616	Connector to Third Street Class 2 downtown bypass
21	4,455	**0.84**	Saxony Road between La Costa Avenue and Quail Hollow Drive	$26,730	North-south connector
Total:	**118,068**	**22.36**		**$708,408**	

Table 9-2b: Capital Improvement Projects

Segments Numbers	Feet	Miles	Description	Est. Costs*	Notes
Class 3 Facilties					
22	3,382	**0.64**	Coast Highway 101 between K Street and D Street	$2,367	Class 3 through downtown
23	7,172	**1.36**	Windsor Drive/Villa Cardiff Drive/Woodlake Drive	$5,020	"Safe Routes to School" serving Ada Harris Elementary
24	12,695	**2.40**	Balour Drive/Bonita Drive/Crest Drive/Melba Drive/Nardo Drive	$8,887	Routes north of Santa Fe Drive- "Safe Routes to School" serving San Dieguito Academy, Ocean Knoll Elementary and Oakcrest Junior High Schools
25	1,662	**0.31**	Westlake Street	$1,163	Southern end of Quail Garden Drive route
26	7,328	**1.39**	D Street/Stratford Drive/Requeza Street	$5,130	Downtown to central Encinitas connector
27	3,104	**0.59**	Urania Avenue	$2,173	"Safe Routes to School" serving Capri Elementary
28	6,709	**1.27**	Chesterfield Drive/Newcastle Avenue/Liverpool Drive/MacKinnon Avenue	$4,696	Cardiff to central Encinitas connector
29	6,247	**1.18**	Birmingham Drive (east from MacKinnon) and Lake Drive	$4,373	Cardiff to central Encinitas connector
30	3,210	**0.61**	San Elijo Avenue between Manchester Avenue and Chesterfield Drive	$2,247	Popular cycling route
31	8,209	**1.55**	Lone Jack Road between Rancho Santa Fe Road and Fortuna Ranch Road	$5,746	Popular cycling route - Connection from Rancho Santa Fe Road to central Olivenhain
32	1,861	**0.35**	El Camino del Norte from Rancho Santa Fe Road to County of San Diego	$1,303	Connector with County of San Diego route
33	6,916	**1.31**	Village Park Way/Morning Sun Drive	$4,841	"Safe Routes to School" serving Diegueno Junior High School
34	3,878	**0.73**	Via Cantebria between Garden View Road and Town Center Drive	$2,715	Park and retail center access
35	4,877	**0.92**	Cerro Road	$3,414	Alternative route to circumvent El Camino Real/Encinitas Boulevard intersection
36	1,615	**0.31**	Requeza Road between Stratford Drive and Vulcan Avenue	$1,131	Downtown to central Encinitas connector
37	3,367	**0.64**	Second Street between D and K Streets	$2,357	Alternative route to circumvent Coast Highway 101
38	10,038	**1.90**	Saxony Road between Quail Gardens Drive and Encinitas Boulevard	$7,027	North-south connector
39	2,822	**0.53**	Manchester Avenue between San Elijo Avenue and Liverpool Drive and Chesterfield Avenue between Manchester Avenue and Newcastle Avenue	$1,975	Less traveled alternative route between eastern Encinitas and Cardiff area
Total:	**95,092**	**18.01**		**$66,564**	

Notes: **System Total:** **$7,216,756**

**Typical costs are described in this chapter, but the following are reasonable assumptions:*

Class 1 paths costs vary considerably - for this project: $1,722,507 per mile. (Approx. $326/LF)

Class 2 lanes typical cost: $32,000 per mile. (Approx. $6.00/LF)

Class 3 routes typical cost: $3,700 per mile. (Approx. $0.70/LF)

9.2.2 Class 2 Bikeways

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. The cost variation is due to the amount of striping and signage installed. For example, the cost will be higher where substantial re-striping is needed, or right-of-way acquisition. The cost used in Table 9-2 was $6 per linear foot, or approximately $32,000 per mile.

9.2.3 Class 3 Bikeways

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 Table 9-2 was $0.70 per linear foot, or approximately $3,500 per mile.

9.2.4 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, $1,200 to $1,500 per linear foot is adequate.

9.3 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.

9.3.1 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).

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 Encinitas:

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.

9.3.2 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 $7.2 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.

9.3.3 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.

Coastal Conservancy Funds

Coastal communities are eligible to receive funds from the Coastal Conservancy from its Coastal Access Program. Bicycle parking and bicycle access projects are eligible, but must be within the coastal zone as defined by the locally adopted Local Coastal Program (LCP). Generally, projects must meet the following criteria:

- Serve a greater than local need;
- Address a critical public safety problem;
- Take advantage of a unique opportunity;
- Be part of a comprehensive regional access program;
- Demonstrate an innovative and cost-effective design that meets the "Conservancy's Coastal Access Standards and Recommendations";
- Be completed within one year of grant approval; and
- Provide wheelchair access opportunities

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.

9.3.4 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 Encinitas 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.

9.3.5 Most Likely Sources

According to City of Encinitas 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 Encinitas General Fund
4) Developer Impact Fees
5) BTA (Bicycle Transportation Account)
6) APCB (Air Pollution Control Board)

Table 9-3a: Bikeway Facility Funding Summary

Grant Source	Due Date	Agency	Annual Total	Match Required	Eligible Applicants	Eligible Bikeway Project Types			Remarks
						Com	Rec	Safety	
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 BikewayPlan	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, >$300,000
Flexible Congestion Relief Program (FCRP)	Dec. STIP cycle	Caltrans	$300 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 Commision and US DOE

Table 9-3b: Bikeway Facility Funding Summary

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 - Congestion Management and Air Quality Program (CMAQ)	June 1	Caltrans		20% non-federal match	Federally certified jurisdictions				If county redesignated to attainment status for ozone, may lose this source
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

10

Design Guidelines

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.

10.1 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."

10.1.1 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.

10.1.2 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.

10.1.3 "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. The City of Encinitas may consider institutionalizing bicycle planning.

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 Encinitas, 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.

10.1.4 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.

10.1.5 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” (Section 10.2.22). Park and open space planning 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.

10.1.6 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. 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 Encinitas. 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.

10.1.7 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 incorporating 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.

10.1.8 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’ 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 Encinitas. However, there are bicycle parking facilities along the downtown streetscape, at City Hall, the Community Center and some parks and other City facilities. The City of Encinitas does have a minimum bicycle parking ordinance (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 program 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.

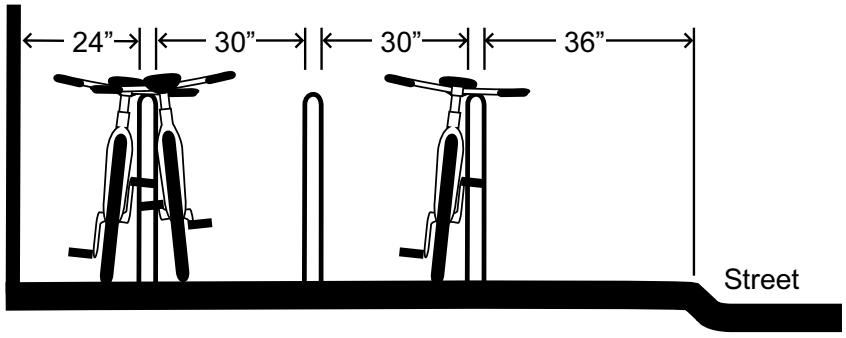
Rack Element

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.

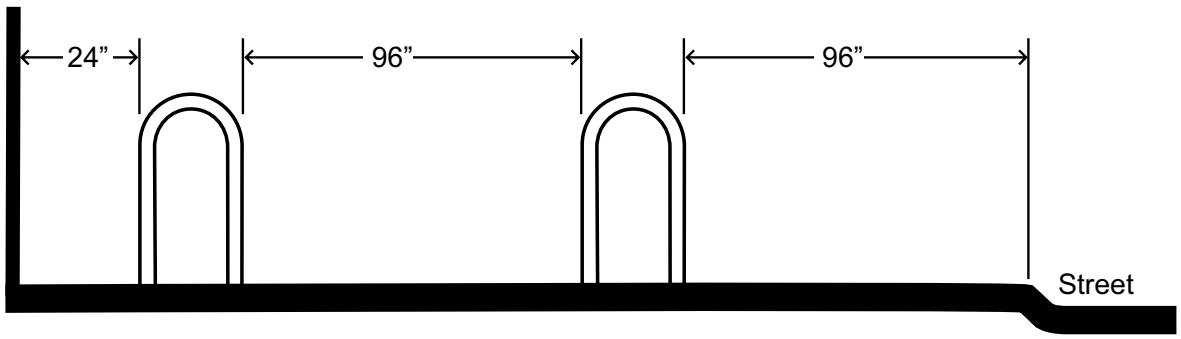
Inverted “U” type racks are most recommended because each element can support two bicycles. Commonly used “wave” type racks are not recommended because they support the bicycle at only one point. Cyclists often park their bikes parallel with the rack, instead of perpendicular as intended, which reduces 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 Element - Parallel to Wall/Street Setback



Rack Element - Perpendicular to Wall/Street Setback



Dimensions are recommended minimums.

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.

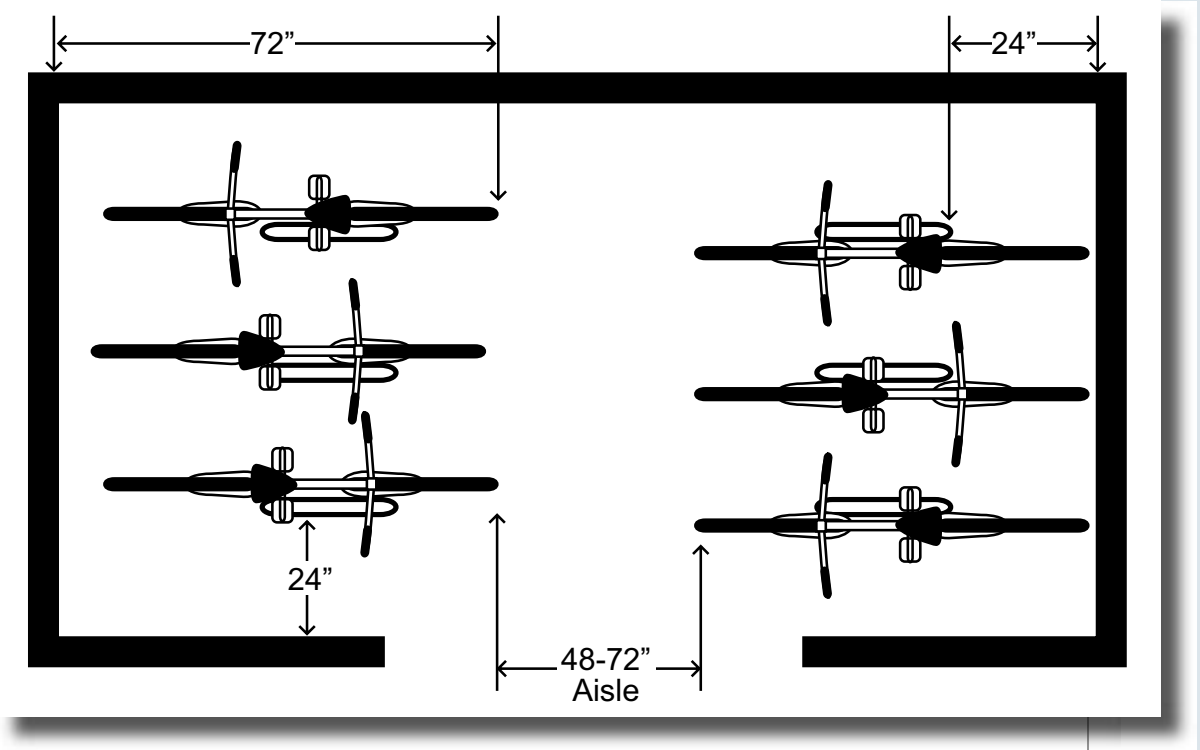
The rack should provide easy, independent bike access. Typical inverted “U” rack elements mounted in a row should be placed on 30” centers. Normally, the handlebar and seat heights will allow two bicycles to line up side-by-side in opposite directions. If it is too inconvenient and time-consuming to 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 minimum aisle width is 72 inches The depth for each row of parked bicycles should also be 72 inches.

Rack Area



Dimensions are recommended minimums.

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.

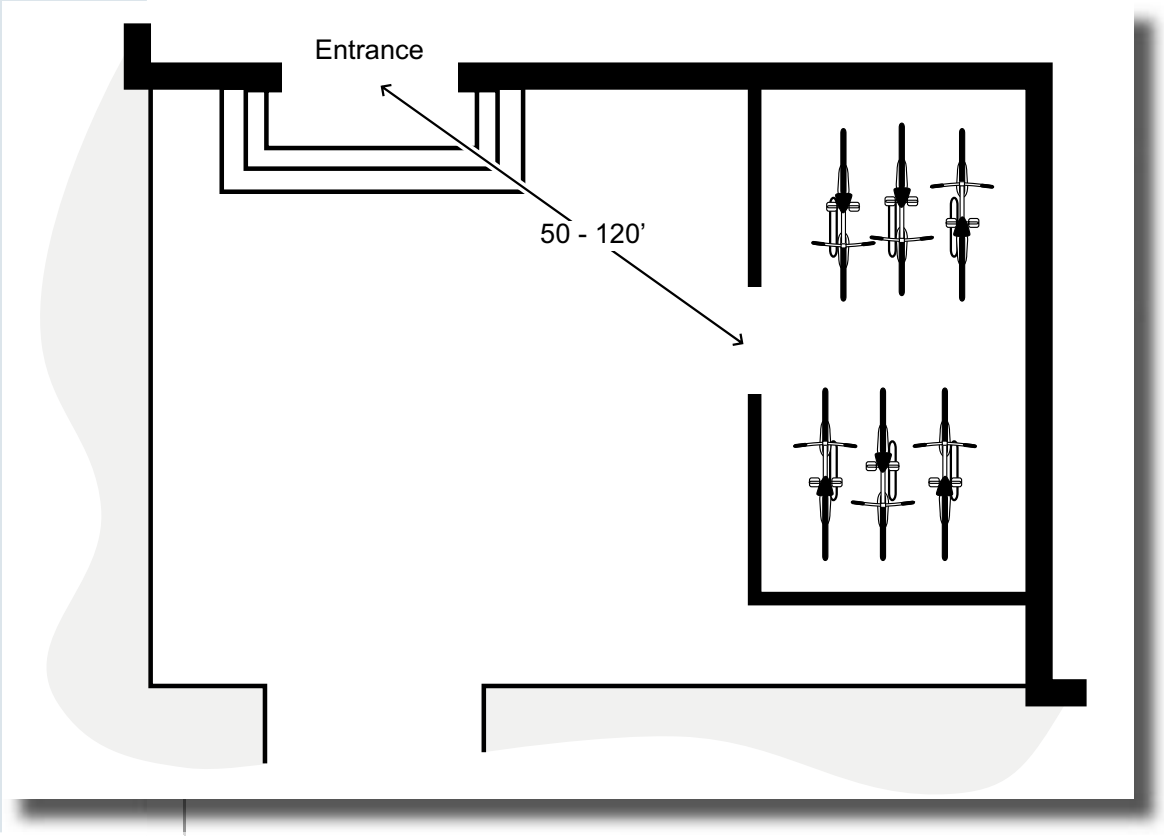
Rack Area Site

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 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.

Rack Area Site



Distance from entrance is recommended maximum (no more than a 30-second walk).

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. Three existing off-the-shelf designs are shown at right. The bottom image is of a commissioned, artist-designed bicycle rack in Pershing Square, Los Angeles.

10.1.9 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.

10.1.10 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 complements the City's adopted Public Road Standards, which implements the General Plan's Circulation Element. The Public Road 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 10-1 (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.

When the needs assessment and preliminary design indicate the need for bikeways, the designer should consider traffic operations factors in determining the actual design treatment for the bikeway. The following should be considered in the design of the roadway and bicycle facility:

- 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.

10.2 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.

Table 10-1: Recommended Pavement 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:

Local roadway standards still apply.
Primarily applicable to Class 3 and "Undesignated" routes.
SH = Shoulder, SL = Shared Lane.
Share lane is acceptable for volumes of less than 1,200 ADTs.
Provide 8' shoulder for volumes greater than 10,000 ADTs.

Source: Selecting Roadway Design Treatments to Accommodate Bicycles

10.2.1 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 10-1 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 supercede current City roadway standards, and they apply to Class 3 routes only.

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 Table 10-1 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.

10.2.2 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 10-1 are based on the assumption that adequate sight distance is available. In situations where there is not adequate sight distance, the provision of additional width may be necessary.

10.2.3 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 the table should be increased by one foot minimum.

10.2.4 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. The slowing of a motor vehicle on a steep grade to pass a cyclist can result in a diminished level of service.

10.2.5 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.

10.2.6 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.

10.2.7 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 are 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 that are intended to warn motorists to reduce vehicle speeds prior to intersections be allowed to cross through the bicycle travel lane.

10.2.8 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.

10.2.9 Drainage Facilities

Storm water drainage facilities and structures are usually located along the edge of roadways where they often 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 have the narrow bicycle wheels drop into the grate. A lesser hazard is caused by cyclists swerving into the lane of traffic to avoid any type of 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.

10.2.10 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.

10.2.11 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, who would also undoubtedly use such facilities. 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.

10.2.12 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.

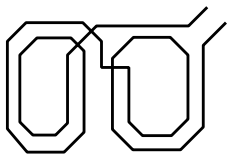
Traffic Signals and Detectors

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.

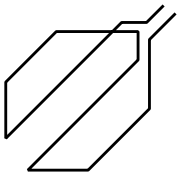
Since detectors can fail, added redundancy in the event of failure is recommended in the form of pedestrian push buttons at all signalized intersections. These buttons should be mounted in a location that permits their activation by a cyclist without having to dismount.

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. Of the types available, those shown at left should be used. As an convenience for cyclists, the strongest loop detection point should be marked with a bright paint spot.

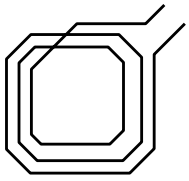
Quadrupole Loop
- Detects most strongly in center
- Sharp cut-off of sensitivity
- Used in bike lanes



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 for advanced detection



Source: City of San Diego

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.

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 subplaques. 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 subplaque options.)

Roadways that are 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 10-1) with relatively high posted travel speeds of 40 m.p.h. or greater;
- Shared lanes (conforming with Table 10-1) 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.

10.2.13 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.

10.2.14 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.)

10.2.15 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.

10.2.16 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 10-1 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.

10.2.17 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.

10.2.18 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.

10.2.19 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 bicycle facilities within the City of Encinitas.

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 preconstruction 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 close permanently 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.

10.2.20 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. The City of Encinitas makes available a Service Request form via the city's Internet home page to allow citizens to report problems including, but not limited to, streets, sidewalks, tree trimming and other civil engineering and infrastructural issues. It does not specifically mention bicycle facilities in its list of selected problems, but does offer the user the opportunity to type in the particulars of any street-related issue.

Currently, there is an unofficial paved path separated from the adjacent southbound Class 2 striped bike lane by a berm along on South Coast Highway 101 between K Street and North Cardiff State Beach. This unofficial paved path dates back to prior to the City's incorporation in 1986. Functionally, the paved area acts as a multi-use path where conflicts generally occur because of the number of and different types of uses of the path in combination with the adjacent parallel parking. Maintenance of a stretch of this stretch is problematic given the combination of the number of users, the berm, the parallel parking, and the weight of the street sweeping equipment in relation to the bluff edge in a few spots.

As a result, a conceptual study is underway titled the "South Coast Highway 101 Bicycle and Pedestrian Improvement Concept Study" to address and resole the current conflicts between bicyclists, pedestrians, and vehicles, but also improve safety, related traffic flow and access. When this project is complete, maintenance of this stretch will not be overlooked given the enhanced pedestrian and bicycle improvements as a result.

10.2.21 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 current provision of bus-mounted bicycle racks on all 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.

10.2.22 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.

10.3 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.

10.3.1 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 Coastal Rail Trail. 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, mountain bikes 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 roughly equal distribution 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 bikes, far outstripping sales of drop-bar type road bike sales. The mountain bike's 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 the coastal trails of southern California 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 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."

10.4 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 now in metric form.

10.4.1 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 2 feet width graded area should be maintained adjacent to both sides of the pavement. However, 3 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 serve as a separate jogging path. The vertical clearance to obstructions should be a minimum of 8 feet. However, vertical clearance may need to be greater to permit passage of maintenance vehicles and, in undercrossings and tunnels, a clearance of 10 feet is desirable for adequate vertical shy distance.

10.4.2 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 5 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.

10.4.3 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.

10.4.4 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.

10.4.5 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.

10.4.6 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.

10.4.7 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.

10.4.8 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.

10.4.9 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.

10.4.10 Pavement Structure

Under most circumstances, a two-inch thick asphalt top course placed on a six-inch thick select granular subbase 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.

10.4.11 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.

10.4.12 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.

10.4.13 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.)

10.4.14 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.

10.5 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.

Most of the bicycles sold today 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.

10.6 Class 2 Facilities

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

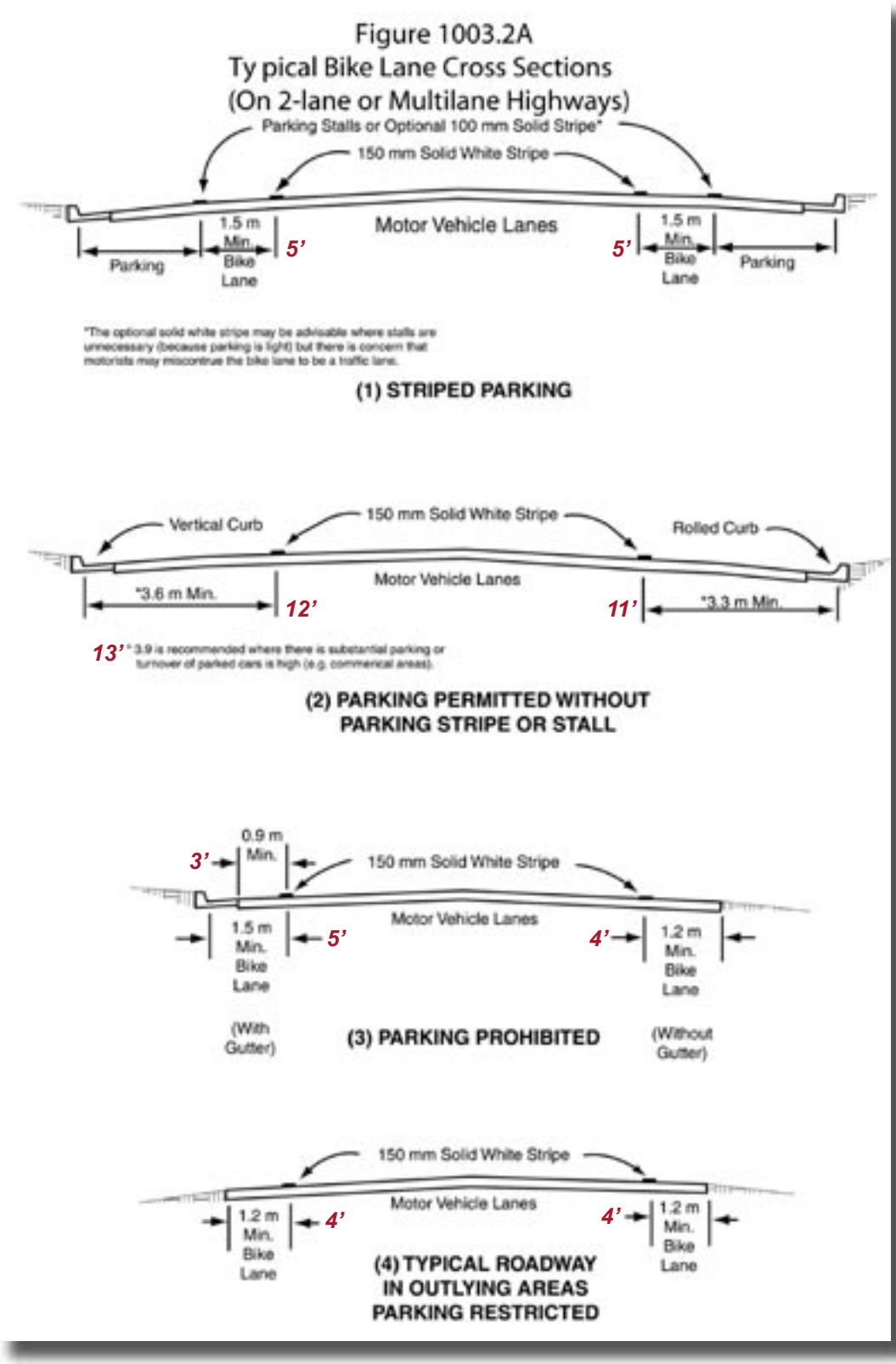
Bicycle lanes can be considered when it is desirable to delineate available road space for preferential use by cyclists and motorists and to provide for more predictable movements by each. Bicycle lane markings can increase a cyclist's confidence in motorists not straying into his/her path of travel. 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.

10.6.1 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



Source: Caltrans Highway Design Manual (Imperial dimensions added in red.)

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 second configuration of Figure 1003.2A 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 second 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 second 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.

10.6.2 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 are 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 more specific information.)

10.6.3 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, the City of Carlsbad uses a combination “NO PARKING/BIKE LANE” sign, especially along the beach area 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 pavement striping that is skid-resistant. 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.

10.6.4 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.

10.7 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.

10.7.1 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.

Appendices

Appendix A: Caltrans BTA Compliance

Appendix B: Agency Publications

Appendix C: Guidelines for Selecting Safe Routes To School

Appendix D: California Vehicle Code - Bicycle Use of Roadways

Appendix A: Caltrans BTA 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 discuss 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.

Encinitas' population is estimated to be approximately 62,586 (SANDAG 2004). The established number of commuters in the plan area is 4,388. The total bicycling population is determined by estimating the sum of adult commuters, children who ride to school, and the number of bicycle commuters that may result from the implementation of the Bikeway Master Plan.

According to Census data, approximately 50 percent of any given population is employed, or 31,293 persons for Encinitas. Census data also states that the national average of people who commute to work by bicycle is four tenths of one percent of the given population, or 125 persons for Encinitas.

According to Census figures, the school age population (5-19 years old) is 19 percent of the overall population, or 11,891 for Encinitas. According to general surveys conducted for other recent bikeway master plans, roughly 1.5 percent of school age children ride bikes to school, or 178 in Encinitas.

These additional 178 school age bicycle commuters added to the 125 adult commuters yields an estimated City total of 303 bicycle commuters, or roughly one half of one percent of Encinitas' total population of 62,586. The estimated increase resulting from implementation of this plan is 15 or five percent more than the current 303 bicycle commuters in Encinitas, totaling 318.

Note that using U.S. Census 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, field experience indicates that bicycle transportation use is more prevalent in Encinitas than in other cities for which the consultant has completed bikeway master plans.

(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.

Maps were derived primarily from data supplied by the U.S. Census Bureau via SANDAG. This information is contained in maps and text in Chapter 3, beginning on page 3-2, including Figure 3-1: 2002 Land Use, Figure 3-2: 2030 Land Use, Figure 3-3: 2002 Population Density, Figure 3-4: 2030 Population Density, Figure 3-5: 2002 Housing Density, Figure 3-6: 2030 Housing Density and Figure 3-9: Trip Origin and Destination Points, and accompanying text.

(c) A map and description of existing and proposed bikeways.

This map and description can be found in Chapter 8, beginning on page 8-1, and Figure 8- 1: Proposed Bikeway System, on page 8-3.

(d) A map and description of existing and proposed end-of-trip bicycle parking facilities. These shall include, but not be limited to, parking at schools, shopping centers, public buildings and major employment centers.

This information is contained in maps in Chapter 3, in Figure 3-7: 2002 Employment Density, Figure 3-8: 2030 Employment Density and Figure 3-9: Trip Origin and Destination Points.

Bicycle parking facilities are generally provided at all schools, shopping centers, public buildings and major employment centers shown on the maps, but only some public buildings, commercial, and office professional buildings are equipped for bicycle commuters, including but not limited to, locker, restroom and shower facilities.

Like most California municipalities, no real facility inventory is available for Encinitas. However, there are bicycle parking facilities along the downtown streetscape, at City Hall, the Community Center and some parks and other City facilities. The City of Encinitas does have a minimum bicycle parking ordinance (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.

(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.

This information is contained in Chapter 4: Intermodal Analysis. NCTD, AMTRAK and Coaster commuter rail trains provide space for bicycles on board during off-peak hours without requiring permits as well as bicycle lockers at the downtown transit center. Also, all NCTD Transit buses are equipped with bike racks. There are two park-and-ride lots in Encinitas and one immediately north in Carlsbad on La Costa Avenue at Interstate 5.

(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.

This map and description can be found in Chapter 3, in Figure 3-9: Trip Origin and Destination Points, Figure 3-7: 2002 Employment Density and Figure 3-8: 2030 Employment Density.

Some public buildings, commercial, and office professional buildings are equipped for bicycle commuters, including but not limited to, locker, and restroom and shower facilities.

(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.

The Parks and Recreation Department of the City has conducted bicycle safety education programs for elementary school students, including bicycle rodeos, as part of its ongoing Family Enrichment Program.

The City of Encinitas relies upon the San Diego County Sheriffs Department for its law and traffic enforcement services. San Diego County Sheriffs Department efforts to enforce provisions of the Vehicle Code pertaining to bicycle operation have included and continue to include citing both motorists and cyclists for violations of the Vehicle Code.

The resultant effect on accidents involving bicyclists has been a reduction in reported crashes per year in relation to population. This is inferred from the relatively flat crash rate over the last eleven years, even though there have been substantial increases in development and population contributing to increases in motor vehicle miles driven. (See Chapter 5: Safety Analysis.)

(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.

Adopted in 1989, the General Plan contains goals and policies to guide development. The Circulation Element of the General Plan proposes the adoption of a bikeway facility system to provide residents a safe and efficient alternative to the private automobile for travel within the city, and ultimately, to adjacent jurisdictions.

The bikeway facility system, as presented in the Circulation Element, was not fully articulated since the Circulation Element only identified bikeways along city roadways without regard to the location of the bikeway facility classifications that were also proposed.

The San Diego County Bicycle Use and Attitude Survey (1994), a countywide public opinion survey, further demonstrated the degree of community support for more and improved bicycle facilities. The top three reasons for not bicycling most often within their community were: 1) “a lack of desired types of bicycle facilities;” 2) “local facilities are unsafe;” and 3) “not enough bike facilities available.”

For this update, two community workshops were held to gather public opinion and to obtain feedback from knowledgeable local cyclists. The consultant also presented project reports to the Traffic Commission, the Planning Commission and the City Council.

Specifically for this project, citizen and community involvement was solicited through the public workshop input and a survey questionnaire distributed for this update. The questionnaire results and specific respondents’ comments were used extensively in evaluating the existing bikeway system and determining where improvements were needed. Questionnaire analysis can be found in Chapter 7: Community Input, including all questionnaire and community workshop comments. Community input truly drove many of the decisions made in forming this bikeway master plan.

Finally, all specific plan areas with planned bicycle facilities helped determine and prioritize the bike facility alignments and connectivity to the overall citywide system presented in the bike plan update.

(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. Many questionnaire respondents also specifically requested completion of these linkages. Local air quality and energy conservation goals as expressed in the City of Encinitas General Plan include fulfilling state policies to maintain, improve and enhance the quality of air, water and land according to state and national standards and local needs, and to conserve water, air and energy by encouraging new development which uses public facilities currently available and minimizes the need to travel. This plan also works to make bicycle travel within the City of Encinitas 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.

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, completion of the Coastal Rail Trail was given first priority, followed by segments that would most benefit bicycle transportation and the overall bikeway system in Encinitas. (See Figure 9-1: Existing and Proposed Bikeway Facilities.)

Note that the following segment numbering sequence lists the sole Class 1 facility (Coastal Rail Trail) first, followed by the proposed Class 2 facilities and the Class 3 facilities last. This represents the recommended prioritization within facility classes only, not an overall prioritization. To try to prioritize all the facility classes does not take into account that 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 2 and 3 facilities be regarded as parallel lists and be implemented as appropriate funds become available for each type of facility. (See Table 9-2a and 9-2b: Capital Improvement Projects, for more information.)

The opportunity exists for the installation of a Class 1 facility that would not only provide the relaxed recreational atmosphere associated with an off-street facility, but could also improve commuter connections. The Class 1 route proposed in Figure 9-1 would be designed for multipurpose use. The paths should be wide enough (8 feet minimum) to accommodate multiple user types and should include an unpaved side path (2 to 4 feet) for users who prefer a softer trail. (See Figure 9-1: Existing and Proposed Bikeway Facilities.)

Class 1 Facilities (CIP Segment 1 only)

CIP Segment 1 - Coastal Rail Trail (CIP Segment 1): Completion of the Class 1 portions of the Coastal Rail Trail along the entire length of the City of Encinitas between the Cities of Carlsbad and Solana Beach would be a boon to local and regional cyclists. The facility will be a paved, multi-use, regional route connecting the coastal cities of San Diego County within the rights-of-way of the existing rail line and within roadways where the rail line access does not exist, such as over lagoons.

Class 2 Facilities (CIP Segments 2-21)

CIP Segment 2 - Coast Highway 101 between K Street and Cardiff State Beach: This segment upgrades the southernmost section of Coast Highway 101, which is made up of an unorganized arrangement of official and “unofficial” bikeway facilities. This is the only bikeway connection between Encinitas and Solana Beach.

CIP Segment 3 - Coast Highway 101 between D Street and La Costa Avenue: This segment upgrades the northern section of Coast Highway 101 from a Class 3 route to a Class 2 lane. This is a very heavily used bicycling route, for commuting, recreation and training. This Class 2 installation is also called for in the North 101 Corridor Specific Plan.

CIP Segment 4 - Leucadia Boulevard between Coast Highway 101 and Urania Avenue: This segment upgrades a currently undesignated route to a Class 2 lane. This is a fairly heavily used route over Interstate 5 between eastern Encinitas and Carlsbad and coastal Encinitas. It is also intended to improve access to a proposed Urania Avenue Class 3 route to serve a "Safe Routes to School" function for Capri Elementary School.

CIP Segment 5 - Santa Fe Drive between El Camino Real and San Elijo Avenue: This segment is an upgrade of an east-west roadway connecting east central Encinitas under Interstate 5 with downtown coastal Encinitas. A high school lies near the center of this segment and it also serves a hospital and retail center just west of Interstate 5.

CIP Segment 6 - Manchester Avenue between San Elijo Avenue and Interstate 5: This is one of three segments of Manchester Avenue, but the only one west of Interstate 5. This is a fairly well used route connecting southeastern and coastal sections of Encinitas under Interstate 5. It would also provide a Class 2 access between the coastal areas and Mira Costa College, which lies on the only section of Manchester Avenue that currently has Class 2 facilities. This is a scenic route.

CIP Segment 7 - Manchester Avenue between El Camino Real and Trabert Ranch Road: This segment is the second of three on Manchester Avenue and a continuation of an existing Class 2 segment just east of Interstate 5. It will likely require right-of-way acquisition due to limited roadway width and road widening will require significant grading due to local topography. It is part of a popular and scenic cycling route.

CIP Segment 8 - Manchester Avenue between Trabert Ranch Road and Encinitas Boulevard: This segment is the third of three Class 2 segments proposed for Manchester Avenue. It connects to an existing Class 2 lane on Encinitas Boulevard and access to a retail center. It is part of a popular cycling route.

CIP Segment 9 - Rancho Santa Fe Road between Encinitas Boulevard and El Camino del Norte: This segment provides a connection between existing Class 2 lanes on Encinitas Boulevard and a short existing Class 2 segment on Rancho Santa Fe Road north of El Camino del Norte. It would be part of an overall route connecting Carlsbad to eastern Encinitas. It is a popular cycling route.

CIP Segment 10 - Rancho Santa Fe Road between Calle Santa Catalina and City of Carlsbad boundary: This segment would complete a route connecting Carlsbad and eastern Encinitas with coastal Encinitas. The northern end of this segment comes very close to Leucadia Boulevard (Olivenhain Road in Carlsbad) and would provide another connection to coastal Encinitas from eastern Encinitas and Carlsbad.

CIP Segment 11 - El Camino Real between Manchester Avenue and Tennis Club Drive: This is a short section of El Camino Real that otherwise has Class 2 lanes in place as part of recent construction.

CIP Segment 12 - Quail Hollow Drive between Saxony Road and Swallowtail Road: This is a short continuation of Quail Gardens Drive that otherwise has Class 2 lanes in place as part of recent construction.

CIP Segment 13 - Vulcan Avenue/San Elijo Avenue between Chesterfield Drive and Leucadia Boulevard: Vulcan Avenue is a popular north-south route for cyclists who would prefer not ride on busier Coast Highway 101. This segment is the subject of an ongoing bicycle and pedestrian study and noted in the North 101 Corridor and Downtown Encinitas Specific Plans.

CIP Segment 14 - Vulcan Avenue Between Leucadia Boulevard and La Costa Avenue: This is the northern portion of a popular north-south route and included in a specific plan.

CIP Segment 15 - Gardenview Road between El Camino Real and Willowspring Drive/ Glen Arbor Drive: This segment would complete a connection between El Camino Real and the residential areas around Willowspring Drive and Glen Arbor Drive. The latter two streets are one-way couplets.

CIP Segment 16 - Willowspring Drive/Glen Arbor Drive between Encinitas Boulevard and Village Park Way: Class 2 lanes already exist on a significant portion of these two one-way couplet streets. This segment would complete this route and provide a connection between El Camino Real and Encinitas Boulevard through this large residential area.

CIP Segment 17 - Mountain Vista Drive between El Camino Real and Willowspring Drive: This segment would provide a connection between El Camino Real and the WIllow-spring Drive/Arbor Drive couplet through a large residential area.

CIP Segment 18 - Piraeus Street between Leucadia Boulevard and La Costa Avenue: This segment would provide another north-south connection between Carlsbad and La Costa Avenue and Leucadia Boulevard. Currently, none exists east of Coast Highway 101.

CIP Segment 19 - Encinitas Boulevard/Rancho Santa Fe Road to eastern city boundary: Along with a small section (CIP Segment 20) at the far west end west of Coast Highway 101, this segment would complete the Class 2 lane to the eastern city limits. This segment would provide a connection to County facilities east of the City of Encinitas.

CIP Segment 20 - Encinitas Boulevard/B Street between Interstate 5 and Third Street: This is a small section of Encinitas Boulevard west of Coast Highway 101 that would connect with the existing Class 2 lanes on Third Street. This would provide a connection to coastal and downtown Encinitas from east of Interstate 5.

CIP Segment 21 - Saxony Road between La Costa Avenue and Quail Hollow Drive: This section of Saxony Road would connect with existing and proposed Class 2 lanes on Quail Gardens Drive and Quail Hollow Drive. This would provide a connection between Encinitas Boulevard and La Costa Avenue east of Interstate 5.

Class 3 Facilities (CIP Segments 22-39)

CIP Segment 22 - Coast Highway 101 between K Street and D Street: Coast Highway 101 has limited roadway width, high levels of motor vehicle traffic and angle parking. Class 2 bike lanes are available on nearby Third Street as an alternate parallel route to avoid the problems of riding on Highway 101.

CIP Segment 23 - Windsor Road/Villa Cardiff Drive/Woodlake Drive: Parts of these three streets are proposed as Class 3 routes primarily serving Ada Harris Elementary School as “Safe Routes to School” as well as park access.

CIP Segment 24 - Balour Drive/Bonita Drive/Crest Drive/Melba Road/Nardo Road: Portions of these five streets north of Santa Fe Drive are proposed as Class 3 routes primarily serving San Dieguito Academy, Ocean Knoll Elementary and Oakcrest Junior High Schools as “Safe Routes to School.”

CIP Segment 25 - Westlake Street: This route is the southern continuation of the Quail Gardens Drive Class 2 lane across Encinitas Boulevard.

CIP Segment 26 - D Street/Stratford Drive/Requeza Street: This route connects central and downtown coastal Encinitas via a safe crossing of Interstate 5 using the Requeza Street bridge. This route is intended to take advantage of a freeway crossing that is not at an interchange and experiences low motor vehicle traffic volumes.

CIP Segment 27 - Urania Avenue: This is a Class 3 routes primarily serving Capri Elementary School as a safe route to school.

CIP Segment 28 - Chesterfield Drive/Newcastle Avenue/Liverpool Drive/Mackinnon Avenue: These are an alignment of parts of four streets proposed as a Class 3 route connecting coastal Cardiff and central Encinitas east of Interstate 5, including connection to the future park at the Hall property.

CIP Segment 29 - Birmingham Drive and Lake Drive: These two streets together form a proposed Class 3 route serving Ada Harris Elementary School and Park, Cardiff Sports Park, and a park and ride lot. This route connects coastal Cardiff and central Encinitas east of Interstate 5.

CIP Segment 30 - San Elijo Avenue between Manchester Avenue and Chesterfield Drive: This Class 3 segment is a continuation of Segment 6 (Manchester Avenue) and completes a route connecting Carlsbad and eastern Encinitas with coastal Encinitas. This segment is proposed as a Class 3 primarily due to limited rights-of-way. This is a popular cycling route.

CIP Segment 31 - Lone Jack Road between Rancho Santa Fe Road and Fortuna Ranch Road: This segment would provide a connection between Rancho Santa Fe Road and central Olivenhain immediately to the east that is served by this route only.

CIP Segment 32 - El Camino del Norte between Rancho Santa Fe Road and County of San Diego boundary: This segment would provide a connection to County facilities east of the City of Encinitas. This is one of only two connecting routes with unincorporated County land east of Encinitas.

CIP Segment 33 - Village Park Way/Morning Sun Drive: This Class 3 route primarily serves Diegueno Junior High School, but also provides a connection between Willowspring/Arbor Drive and Rancho Santa Fe Road. This route is not contiguous.

CIP Segment 34 - Via Cantebria between Garden View Road and Town Center Drive: This route is a continuation of an existing Class 2 lane that currently ends just north of Garden View Road. It would connect this Class 2 lane with Leo Mullens Sports Park and a retail center.

CIP Segment 35 - Cerro Drive: This route would provide a safer alternative to going through the intersection of Encinitas Boulevard and El Camino Real.

CIP Segment 36 - Requeza Street/East F Street between Stratford Drive and Vulcan Avenue: This route would provide an direct alternate connection between central Encinitas and Vulcan Avenue.

CIP Segment 37 - Second Street between D and K Streets: This route would provide an alternative to riding on Coast Highway 101.

CIP Segment 38 - Saxony Road between Quail Hollow Drive and Encinitas Boulevard: This route would provide a north-south route between La Costa Avenue and Encinitas Boulevard east of Interstate 5.

CIP Segment 39 - Manchester Avenue between San Elijo Avenue and Liverpool Drive and Chesterfield Avenue between Manchester Avenue and Newcastle Avenue: Particularly for less experienced cyclists, this route would provide an alternative connection between Manchester and Chesterfield Avenues that avoids a narrow and fairly steep portion of San Elijo Avenue to the west that is part of Segment 30.

More information can be found in Chapter 8: Recommendations, and in Chapter 9: CIP and Bikeway Funding, especially Tables 9-2a and 9-2b on pages 9-4 and 9-5 and Figure 9-1: Capital Improvement Projects, on page 9-3.

(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.

In 1991, the City Council approved the Bikeway Master Plan. Since that time, the City has used the Bikeway Master Plan to guide the planning and development of bicycle facilities throughout the City and the various specific plan areas. A combination of TransNet, TDA, and CIP funds were used primarily for Class 2 lanes and Class 3 routes. Federal TEA-21 funds are dedicated to the Coastal Rail Trail.

Also during this period, over 16.8 miles of Class 2 lanes on new roadways and 3.1 miles of Class 3 routes were implemented citywide and as part of the Downtown Encinitas Specific Plan, North 101 Corridor Specific Plan, and the Encinitas Ranch Specific Plan.

Future financial needs for projects that improve safety and convenience for bicycle commuters in the plan area as listed in this plan total $7,216,756. Detailed information on future financial needs can be found in Chapter 9: CIP and Bikeway Funding, especially Tables 9-2a and 9-2b on pages 9-4 and 9-5 and Figure 9-1: Capital Improvement Projects, on page 9-3.

Appendix B: Agency Publications

Assembly Concurrent Resolution Number 211

On May 16, 2002 (California Bike-to-Work Day), Assembly Member Joe Nation (D-San Rafael) introduced Assembly Concurrent Resolution Number 211, relative to integrating walking and biking into transportation infrastructure. This advisory measure encourages all cities and counties to implement the policies of the California Department of Transportation Deputy Directive 64 and the United States Department of Transportation's design guidance document on integrating bicycling and walking when building their transportation infrastructure. The text of the resolution is as follows:

WHEREAS, Bicycling and walking contribute to cleaner air; and

WHEREAS, Bicycling and walking provide affordable and healthy transportation options for many of the 10 million Californians who do not possess a driver's license; and

WHEREAS, The State Department of Health Services has declared that more than 40,000 Californians annually die from causes related to physical inactivity; and

WHEREAS, The United States Centers for Disease Control has determined that changes in the community environment to promote physical activity may offer the most practical approach to prevent obesity or reduce its co-morbidities. Automobile trips that can be safely replaced by walking or bicycling offer the first target for increased physical activity in communities; and

WHEREAS, Bicycling and walking contribute to safeguarding our coast from offshore oil drilling and enhance California's energy independence and national security by reducing our reliance upon imported oil; and

WHEREAS, Designing roads for safe and efficient travel by bicyclists and pedestrians saves lives; and

WHEREAS, Bicyclists and pedestrians pay sales taxes which provide for the majority of local transportation spending; and

WHEREAS, Local demand for funding from the Bicycle Transportation Account, the Safe Routes to School, and the Transportation Enhancement Activity Programs far exceeds available moneys; and

WHEREAS, The best use of limited financial resources is to include bicycle and pedestrian elements into roadway projects where feasible; and

WHEREAS, Bicycling and walking reduce traffic congestion in California; and

WHEREAS, In February 2000, the United States Department of Transportation issued a design guidance statement titled, "Accommodating Bicycle and Pedestrian Travel: A Recommended Approach-A United States Department of Transportation Policy Statement on Integrating Bicycling and Walking into Transportation Infrastructure;" and

WHEREAS, In March 2001, the California Department of Transportation issued Deputy Directive 64 titled “Accommodating Non-Motorized Travel” which states that “The Department fully considers the needs of non-motorized travelers (including pedestrians, bicyclists and persons with disabilities) in all programming, planning maintenance, construction, operations, and project development activities and products. This includes incorporation of the best available standards in all of the Department’s practices. The Department adopts the best practices concepts in the US DOT Policy Statement on Integrating Bicycling And Walking into Transportation Infrastructure;” now, therefore, be it

RESOLVED by the Assembly of the State of California, the Senate thereof concurring, That in order to improve the ability of all Californians who choose to walk or bicycle to do so safely and efficiently, the Legislature of the State of California hereby encourages all cities and counties to implement the policies of the California Department of Transportation Deputy Directive 64 and the United States Department of Transportation’s design guidance document on integrating bicycling and walking when building their transportation infrastructure.

California Department of Transportation
Deputy Directive Number: DD-64

Title: Accommodating Non-Motorized Travel

Policy

The Department fully considers the needs of non-motorized travelers (including pedestrian bicyclists and persons with disabilities) in all programming, planning, maintenance, construction, operations and project development activities and products. This includes incorporation of the best available standards in all of the Department's practices. The Department adopts the best practice concepts in the U.S. DOT Policy Statement on "Integrating Bicycling and Walking into Transportation Infrastructure."

Definition/Background

The planning and project development process seeks to provide the people of California with a degree of mobility that is in balance with other values. They must ensure that economic, social and environmental effects are fully considered along with technical issues, so that the best interest of the public is served. This includes all users of California's facilities and roadways.

Attention must be given to many issues including, but not limited to, the following:
• Safe and efficient transportation for all users of the transportation system
• Provision of alternatives for non-motorized travel
• Support of the Americans With Disabilities Act (ADA)
• Attainment of community goals and objectives
• Transportation needs of low-mobility, disadvantaged groups
• Support of the state's economic development
• Elimination or minimization of adverse effects on the environment, natural resources, public services, aesthetic features and the community
• Realistic financial estimates
• Cost effectiveness

Individual projects are selected for construction on the basis of overall multimodal system benefits as well as community goals, plans and values. Decisions place emphasis on making different transportation modes work together safely and effectively. Implicit in these objectives is the need to accommodate non-motorized travelers as an important consideration in improving the transportation system.

Responsibilities

Deputy Director, Planning and Modal Programs:
• Ensures that the needs of non-motorized travelers are incorporated into the program element of Transportation Planning and the modal elements of the statewide strategy for mobility.
• Ensures that liaison exists with non-motorized advocates to incorporate non-motorized needs into all program areas including project and system planning.
• Ensures that the needs of the non-motorized travelers are incorporated in personal movement strategies.

Deputy Director, Project Delivery:

• Ensures that projects incorporate best practices for non-motorized travel in the design and construction of capital projects.

Deputy Director, Maintenance and Operations:

• Ensures that the transportation system is maintained and operated in a safe and efficient manner with the recognition that non-motorized travel is a vital element of the transportation system.
• Ensures that the needs of non-motorized travelers are met in maintenance work zones.

District Directors:

• Ensure that best practices for non-motorized travel are included in all district projects and project planning.
• Ensure that best practices for non-motorized travel are implemented in maintenance and travel operations practices.
Chief, Division of Design
• Ensures that project delivery procedures and design guidance include the needs of non-motorized travelers as a regular part of doing business.
• Ensures that all project delivery staff is trained and consider the needs of the non-motorized traveler while developing and designing transportation projects.

Chief, Division of Planning:

• Ensures incorporation of non-motorized travel elements in transportation plans, programs and studies prepared by Transportation Planning.
• Ensures planning staff understand and are trained in the principles and design guidelines, non-motorized funding sources and the planning elements of non-motorized transportation.
• Coordinates Caltrans projects with non-motorized interest groups.
• Ensures incorporation of non-motorized travel elements in Corridor Studies prepared by Transportation Planning.

Chief, Division of Environmental Analysis:

• Ensures that non-motorized travel groups potentially affected by Caltrans projects are identified and have the opportunity to be involved in the project development process.
• Advocates effectively for all reasonable project-specific best practices that support or promote non-motorized travel.

Chief, Division of Maintenance:

• Ensures State-owned facilities are maintained consistent with the needs of motorized and non-motorized travelers.
• Provides guidance and training to those maintaining roadways to be aware of and sensitive to the needs of non-motorized travel.

Chief, Division of Traffic Operations:

• Ensures that the transportation system is operated in accordance with the needs of all travelers including non-motorized travel.
• Provides training and guidance on the operation of the transportation facility consistent with providing mobility for all users.
• Recommends safety measures in consideration of non-motorized travel on California's transportation system.

Chief, Division of Local Assistance:

• Ensures that Local Assistance staff, local agencies and interest groups are familiar with funding programs that are available for non-motorized travelers.
• Ensures that program coordinators responsible for non-motorized travel modes are familiar with non-motorized issues and advocate on behalf of non-motorized travelers.

Applicability

All Caltrans employees who are involved in the planning, design, construction, maintenance and operations of the transportation system.

Design Guidance Accommodating Bicycle and Pedestrian Travel:

A US DOT Policy Statement on Integrating Bicycling and Walking into Transportation Infrastructure

Purpose

Accommodating Bicycle and Pedestrian Travel: A Recommended Approach is a policy statement adopted by the United States Department of Transportation. USDOT hopes that public agencies, professional associations, advocacy groups, and others adopt this approach as a way of committing themselves to integrating bicycling and walking into the transportation mainstream.

The Design Guidance incorporates three key principles:
a) a policy statement that bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist;

b) an approach to achieving this policy that has already worked in State and local agencies; and

c) a series of action items that a public agency, professional association, or advocacy group can take to achieve the overriding goal of improving conditions for bicycling and walking.

The Policy Statement was drafted by the U.S. Department of Transportation in response to Section 1202 (b) of the Transportation Equity Act for the 21st Century (TEA-21) with the input and assistance of public agencies, professional associations and advocacy groups.

Introduction

Bicycling and walking issues have grown in significance throughout the 1990s. As the new millennium dawns public agencies and public interest groups alike are striving to define the most appropriate way in which to accommodate the two modes within the overall transportation system so that those who walk or ride bicycles can safely, conveniently, and comfortably access every destination within a community.

Public support and advocacy for improved conditions for bicycling and walking has created a widespread acceptance that more should be done to enhance the safety, comfort, and convenience of the non-motorized traveler. Public opinion surveys throughout the 1990s have demonstrated strong support for increased planning, funding and implementation of shared use paths, sidewalks and on-street facilities.

At the same time, public agencies have become considerably better equipped to respond to this demand. Research and practical experience in designing facilities for bicyclists and pedestrians has generated numerous national, state and local design manuals and resources. An increasing number of professional planners and engineers are familiar with this material and are applying this knowledge in towns and cities across the country.

The 1990 Americans with Disabilities Act, building on an earlier law requiring curb ramps in new, altered, and existing sidewalks, added impetus to improving conditions for sidewalk users. People with disabilities rely on the pedestrian and transit infrastructure, and the links between them, for access and mobility.

Congress and many State legislatures have made it considerably easier in recent years to fund non-motorized projects and programs (for example, the Intermodal Surface Transportation Efficiency Act and the Transportation Equity Act for the 21st Century), and a number of laws and regulations now mandate certain planning activities and design standards to guarantee the inclusion of bicyclists and pedestrians.

Despite these many advances, injury and fatality numbers for bicyclists and pedestrians remain stubbornly high, levels of bicycling and walking remain frustratingly low, and most communities continue to grow in ways that make travel by means other than the private automobile quite challenging. Failure to provide an accessible pedestrian network for people with disabilities often requires the provision of costly paratransit service. Ongoing investment in the Nation's transportation infrastructure is still more likely to overlook rather than integrate bicyclists and pedestrians.

In response to demands from user groups that every transportation project include a bicycle and pedestrian element, Congress asked the Federal Highway Administration (FHWA) to study various approaches to accommodating the two modes. The Transportation Equity Act for the 21st Century (TEA-21) instructs the Secretary to work with professional groups such as AASHTO, ITE, and other interested parties to recommend policies and standards that might achieve the overall goal of fully integrating bicyclists and pedestrians into the transportation system.

TEA-21 also says that, "Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation projects, except where bicycle and pedestrian use are not permitted." (Section 1202)

Sec. 1202. Bicycle Transportation And Pedestrian Walkways.
(b) Design Guidance.

(1) In general - In implementing section 217(g) of title 23, United States Code, the Secretary, in cooperation with the American Association of State Highway and Transportation Officials, the Institute of Transportation Engineers, and other interested organizations, shall develop guidance on the various approaches to accommodating bicycles and pedestrian travel.

(2) Issues to be addressed - The guidance shall address issues such as the level and nature of the demand, volume, and speed of motor vehicle traffic, safety, terrain, cost, and sight distance.

(3) Recommendations - The guidance shall include recommendations on amending and updating the policies of the American Association of State Highway and Transportation Officials relating to highway and street design standards to accommodate bicyclists and pedestrians.

(4) Time period for development - The guidance shall be developed within 18 months after the date of enactment of this Act.

In August 1998, FHWA convened a Task Force comprising representatives from FHWA, AASHTO, ITE, bicycle and pedestrian user groups, State and local agencies, the U.S. Access Board and representatives of disability organizations to seek advice on how to proceed with developing this guidance. The Task Force reviewed existing and proposed information on the planning and technical design of facilities for bicyclists and pedestrians and concluded that these made creation of another design manual unnecessary. For example, AASHTO published a bicycle design manual in 1999 and is working on a pedestrian facility manual.

The area where information and guidance was most lacking was in determining when to include designated or special facilities for bicyclists and pedestrians in transportation projects. There can also be uncertainty about the type of facility to provide, and the design elements that are required to ensure accessibility.

For example, when a new suburban arterial road is planned and designed, what facilities for bicyclists and pedestrians should be provided? The task force felt that once the decision to provide a particular facility was made, the specific information on designing that facility

is generally available. However, the decision on whether to provide sidewalks on neither, one or both sides of the road, or a shoulder, striped bike lane, wide outside lane or separate trail for bicyclists is usually made with little guidance or help.

After a second meeting with the Task Force in January 1999, FHWA agreed to develop a Policy Statement on Accommodating Bicyclists and Pedestrians in Transportation Projects to guide State and local agencies in answering these questions. Task Force members recommended against trying to create specific warrants for different facilities (warrants leave little room for engineering judgment and have often been used to avoid providing facilities for bicycling and walking). Instead, the purpose of the Policy Statement is to provide a recommended approach to the accommodation of bicyclists and pedestrians that can be adopted by State and local agencies (as well as professional societies and associations, advocacy groups, and Federal agencies) as a commitment to developing a transportation infrastructure that is safe, convenient, accessible, and attractive to motorized AND non-motorized users alike. The Policy Statement has four elements:

a) An acknowledgment of the issues associated with balancing the competing interests of motorized and non-motorized users;

b) A recommended policy approach to accommodating bicyclists and pedestrians (including people with disabilities) that can be adopted by an agency or organizations as a statement of policy to be implemented or a target to be reached in the future;

c) A list of recommended actions that can be taken to implement the solutions and approaches described above; and

d) Further information and resources on the planning, design, operation, and maintenance of facilities for bicyclists and pedestrians.

The Challenge: Balancing Competing Interests

For most of the second half of the 20th Century, the transportation, traffic engineering and highway professions in the United States were synonymous. They shared a singular purpose: building a transportation system that promoted the safety, convenience and comfort of motor vehicles. The post-war boom in car and home ownership, the growth of suburban America, the challenge of completing the Interstate System, and the continued availability of cheap gasoline all fueled the development of a transportation infrastructure focused almost exclusively on the private motor car and commercial truck.

Initially, there were few constraints on the traffic engineer and highway designer. Starting at the centerline, highways were developed according to the number of motor vehicle travel lanes that were needed well into the future, as well as providing space for breakdowns. Beyond that, facilities for bicyclists and pedestrians, environmental mitigation, accessibility, community preservation, and aesthetics were at best an afterthought, often simply overlooked, and, at worst, rejected as unnecessary, costly, and regressive. Many States passed laws preventing the use of State gas tax funds on anything other than motor vehicle lanes and facilities. The resulting highway environment discourages bicycling and walking and has made the two modes more dangerous. Further, the ability of pedestrians with disabilities to travel independently and safely has been compromised, especially for those with vision impairments.

Over time, the task of designing and building highways has become more complex and challenging. Traffic engineers now have to integrate accessibility, utilities, landscaping, community preservation, wetland mitigation, historic preservation, and a host of other concerns into their plans and designs - and yet they often have less space and resources within which to operate and traffic volumes continue to grow.

The additional "burden" of having to find space for pedestrians and bicyclists was rejected as impossible in many communities because of space and funding constraints and a perceived lack of demand. There was also anxiety about encouraging an activity that many felt to be dangerous and fraught with liability issues. Designers continued to design from the centerline out and often simply ran out of space before bike lanes, paved shoulders, sidewalks and other "amenities" could be included.

By contrast, bicycle and pedestrian user groups argue the roadway designer should design highways from the right-of-way limits in, rather than the centerline out. They advocate beginning the design of a highway with the sidewalk and/or trail, including a buffer before the paved shoulder or bike lane, and then allocating the remaining space for motor vehicles. Through this approach, walking and bicycling are positively encouraged, made safer, and included as a critical element in every transportation project rather than as an afterthought in a handful of unconnected and arbitrary locations within a community.

Retrofitting the built environment often provides even more challenges than building new roads and communities: space is at a premium and there is a perception that providing better conditions for bicyclists and pedestrians will necessarily take away space or convenience from motor vehicles.

During the 1990s, Congress spearheaded a movement towards a transportation system that favors people and goods over motor vehicles with passage of the Intermodal Surface Transportation Efficiency Act (1991) and the Transportation Equity Act for the 21st Century (1998). The call for more walkable, livable, and accessible communities, has seen bicycling and walking emerge as an "indicator species" for the health and well-being of a community. People want to live and work in places where they can safely and conveniently walk and/or bicycle and not always have to deal with worsening traffic congestion, road rage and the fight for a parking space. Vice President Gore launched a Livability Initiative in 1999 with the ironic statement that "a gallon of gas can be used up just driving to get a gallon of milk."

The challenge for transportation planners, highway engineers and bicycle and pedestrian user groups, therefore, is to balance their competing interest in a limited amount of right-of-way, and to develop a transportation infrastructure that provides access for all, a real choice of modes, and safety in equal measure for each mode of travel.

This task is made more challenging by the widely divergent character of our nation's highways and byways. Traffic speeds and volumes, topography, land use, the mix of road users, and many other factors mean that a four-lane highway in rural North Carolina cannot be designed in the same way as a four-lane highway in New York City, a dirt road in Utah or an Interstate highway in Southern California. In addition, many different agencies are responsible for the development, management, and operation of the transportation system.

In a recent memorandum transmitting Program Guidance on bicycle and pedestrian issues to FHWA Division Offices, the Federal Highway Administrator wrote, "We expect every transportation agency to make accommodation for bicycling and walking a routine part of their planning, design, construction, operations and maintenance activities." The Program Guidance itself makes a number of clear statements of intent:

- Congress clearly intends for bicyclists and pedestrians to have safe, convenient access to the transportation system and sees every transportation improvement as an opportunity to enhance the safety and convenience of the two modes.

- "Due consideration" of bicycle and pedestrian needs should include, at a minimum, a presumption that bicyclists and pedestrians will be accommodated in the design of new and improved transportation facilities.

• To varying extents, bicyclists and pedestrians will be present on all highways and transportation facilities where they are permitted and it is clearly the intent of TEA-21 that all new and improved transportation facilities be planned, designed and constructed with this fact in mind.

• The decision not to accommodate [bicyclists and pedestrians] should be the exception rather than the rule. There must be exceptional circumstances for denying bicycle and pedestrian access either by prohibition or by designing highways that are incompatible with safe, convenient walking and bicycling.

The Program Guidance defers a suggested definition of what constitutes "exceptional circumstances" until this Policy Statement is completed. However, it does offer interim guidance that includes controlled access highways and projects where the cost of accommodating bicyclists and pedestrians is high in relation to the overall project costs and likely level of use by non-motorized travelers.

Providing access for people with disabilities is a civil rights mandate that is not subject to limitation by project costs, levels of use, or "exceptional circumstances". While the Americans with Disabilities Act does not require pedestrian facilities in the absence of a pedestrian route, it does require that pedestrian facilities, when newly constructed or altered, be accessible.

Policy Statement

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

• Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.

• The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project.

• Where scarcity of population or other factors indicate an absence of need. For example, the Portland Pedestrian Guide requires "all construction of new public streets" to include sidewalk improvements on both sides, unless the street is a cul-de-sac with four or fewer dwellings or the street has severe topographic or natural resource constraints.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day, as is currently the case in Wisconsin. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate.

Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate.

3. Sidewalks, shared use paths, street crossings (including over- and undercrossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

• Planning projects for the long-term. Transportation facilities are long-term investments that remain in place for many years. The design and construction of new facilities that meet the criteria in item 1) above should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years might be built with sufficient width for safe bicycle and pedestrian use in anticipation that facilities will be available at either end of the bridge even if that is not currently the case.

• Addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.

• Getting exceptions approved at a senior level. Exceptions for the non-inclusion of bikeways and walkways shall be approved by a senior manager and be documented with supporting data that indicates the basis for the decision.

• Designing facilities to the best currently available standards and guidelines. The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO Guide for the Development of Bicycle Facilities, AASHTO's A Policy on Geometric Design of Highways and Streets, and the ITE Recommended Practice "Design and Safety of Pedestrian Facilities".

Policy Approach

"Rewrite the Manuals" Approach

Manuals that are commonly used by highway designers covering roadway geometrics, roadside safety, and bridges should incorporate design information that integrates safe and convenient facilities for bicyclists and pedestrians — including people with disabilities - into all new highway construction and reconstruction projects.

In addition to incorporating detailed design information - such as the installation of safe and accessible crossing facilities for pedestrians, or intersections that are safe and convenient for bicyclists - these manuals should also be amended to provide flexibility to the highway designer to develop facilities that are in keeping with transportation needs, accessibility, community values, and aesthetics. For example, the Portland Pedestrian Design Guide (June 1998) applies to every project that is designed and built in the city, but the Guide also notes that:

"Site conditions and circumstances often make applying a specific solution difficult. The Pedestrian Design Guide should reduce the need for ad hoc decision by providing a published set of guidelines that are applicable to most situations. Throughout the guidelines, however, care has been taken to provide flexibility to the designer so she or he can tailor the standards to unique circumstances. Even when the specific guideline cannot be met, the designer should attempt to find the solution that best meets the pedestrian design principles described [on the previous page]"

In the interim, these manuals may be supplemented by stand-alone bicycle and pedestrian facility manuals that provide detailed design information addressing on-street bicycle facilities, fully accessible sidewalks, crosswalks, and shared use paths, and other improvements.

Examples: Florida DOT has integrated bicycle and pedestrian facility design information into its standard highway design manuals and New Jersey DOT is in the process of doing so. Many States and localities have developed their own bicycle and pedestrian facility design manuals, some of which are listed in the final section of this document.

Applying Engineering Judgment to Roadway Design
In rewriting manuals and developing standards for the accommodation of bicyclists and pedestrians, there is a temptation to adopt "typical sections" that are applied to roadways without regard to travel speeds, lane widths, vehicle mix, adjacent land uses, traffic volumes and other critical factors. This approach can lead to inadequate provision on major roads (e.g. a four foot bike lane or four foot sidewalk on a six lane high-speed urban arterial) and the over-design of local and neighborhood streets (e.g. striping bike lanes on low volume residential roads), and leaves little room for engineering judgment.

After adopting the policy that bicyclists and pedestrians (including people with disabilities) will be fully integrated into the transportation system, State and local governments should encourage engineering judgment in the application of the range of available treatments.

For example:
• Collector and arterial streets shall typically have a minimum of a four foot wide striped bicycle lane, however wider lanes are often necessary in locations with parking, curb and gutter, heavier and/or faster traffic.

• Collector and arterial streets shall typically have a minimum of a five foot sidewalk on both sides of the street, however wider sidewalks and landscaped buffers are necessary in locations with higher pedestrian or traffic volumes, and/or higher vehicle speeds. At intersections, sidewalks may need to be wider to accommodate accessible curb ramps.

• Rural arterials shall typically have a minimum of a four foot paved shoulder; however wider shoulders (or marked bike lanes) and accessible sidewalks and crosswalks are necessary within rural communities and where traffic volumes and speeds increase.

This approach also allows the highway engineer to achieve the performance goal of providing safe, convenient, and comfortable travel for bicyclists and pedestrians by other means. For example, if it would be inappropriate to add width to an existing roadway to stripe a bike lane or widen a sidewalk, traffic calming measures can be employed to reduce motor vehicle speeds to levels more compatible with bicycling and walking.

Actions

The United States Department of Transportation encourages States, local governments, professional associations, other government agencies and community organizations to adopt this Policy Statement as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. By so doing, the organization or agency should explicitly adopt one, all, or a combination of the various approaches described above AND should be committed to taking some or all of the actions listed below as appropriate for their situation.

a) Define the exceptional circumstances in which facilities for bicyclists and pedestrians will NOT be required in all transportation projects.

b) Adopt new manuals, or amend existing manuals, covering the geometric design of streets, the development of roadside safety facilities, and design of bridges and their approaches so that they comprehensively address the development of bicycle and pedestrian facilities as an integral element of the design of all new and reconstructed roadways.

c) Adopt stand-alone bicycle and pedestrian facility design manuals as an interim step towards the adoption of new typical sections or manuals covering the design of streets and highways.

d) Initiate an intensive re-tooling and re-education of transportation planners and engineers to make them conversant with the new information required to accommodate bicyclists and pedestrians. Training should be made available for, if not required of, agency traffic engineers and consultants who perform work in this field.

Conclusion

There is no question that conditions for bicycling and walking need to be improved in every community in the United States; it is no longer acceptable that 6,000 bicyclists and pedestrians are killed in traffic every year, that people with disabilities cannot travel without encountering barriers, and that two desirable and efficient modes of travel have been made difficult and uncomfortable.

Every transportation agency has the responsibility and the opportunity to make a difference to the bicycle-friendliness and walkability of our communities. The design information to accommodate bicyclists and pedestrians is available, as is the funding. The United States Department of Transportation is committed to doing all it can to improve conditions for bicycling and walking and to make them safer ways to travel.

Additional Information and Resources

General Design Resources

A Policy on Geometric Design of Highways and Streets, 1994 (The Green Book). American Association of State Highway and Transportation Officials (AASHTO), P.O. Box 96716, Washington, DC, 20090-6716, Phone: (888) 227-4860.

Highway Capacity Manual, Special Report 209, 1994. Transportation Research Board, Box 289, Washington, DC 20055, Phone: (202) 334-3214. Next Edition: FHWA Research Program project has identified changes to HCM related to bicycle and pedestrian design.

Manual on Uniform Traffic Control Devices, 1988. Federal Highway Administration (FHWA), Superintendent of Documents. P.O. Box 371954, Pittsburgh, PA 15250-7954. Next Edition: 2000, will incorporate changes to Part IX that will soon be subject of Notice of Proposed Rulemaking.

Flexibility in Highway Design, 1997. FHWA. HEP 30, 400 Seventh Street SW, Washington, DC 20590.

Pedestrian Facility Design Resources

Design and Safety of Pedestrian Facilities, A Recommended Practice, 1998. Institute of Transportation Engineers, 525 School Street, S.W, Suite 410, Washington, DC 20024-2729, Phone: (202) 554-8050.

Pedestrian Compatible Roadways-Planning and Design Guidelines, 1995. Bicycle / Pedestrian Transportation Master Plan, Bicycle and Pedestrian Advocate, New Jersey Department of Transportation, 1035 Parkway Avenue, Trenton, NJ 08625, Phone: (609) 530-4578.

Improving Pedestrian Access to Transit: An Advocacy Handbook, 1998. Federal Transit Administration / WalkBoston. NTIS, 5285 Port Royal Road, Springfield, VA 22161.

Planning and Implementing Pedestrian Facilities in Suburban and Developing Rural Areas, Report No. 294A, Transportation Research Board, Box 289, Washington, DC 20055, Phone: (202) 334-3214.

Pedestrian Facilities Guidebook, 1997. Washington State Department of Transportation, Bicycle and Pedestrian Program, P.O. Box 47393, Olympia, WA 98504.

Portland Pedestrian Design Guide, 1998. Portland Pedestrian Program, 1120 SW Fifth Ave, Room 802; Portland, OR 97210. (503) 823-7004.

Implementing Pedestrian Improvements at the Local Level, 1999. FHWA, HSR 20, 6300 Georgetown Pike, McLean, VA . (Publication not yet available)

AASHTO Guide to the Development of Pedestrian Facilities, 2000. AASHTO. (Publication not yet available- currently under discussion)

Bikeway Facility Design Resources
Guide for the Development of Bicycle Facilities, 1999., American Association of State Highway and Transportation Officials (AASHTO), P.O. Box 96716, Washington, DC, 20090-6716, Phone: (888) 227-4860.

Implementing Bicycle Improvements at the Local Level, (1998), FHWA, HSR 20, 6300 Georgetown Pike, McLean, VA.

Bicycle Facility Design Standards, 1998. City of Philadelphia Streets Department, 1401 JFK Boulevard, Philadelphia, PA 19103.

Selecting Roadway Design Treatments to Accommodate Bicyclists, 1993. FHWA, R&T Report Center, 9701 Philadelphia Ct., Unit Q; Lanham, MD 20706. (301) 577-1421 (fax only)

North Carolina Bicycle Facilities Planning and Design Guidelines, 1994. North Carolina DOT, P.O. Box 25201, Raleigh, NC 27611. (919) 733-2804.

Bicycle Facility Planning, 1995. Pinsof & Musser. American Planning Association, Planning Advisory Service Report # 459. American Planning Association, 122 S. Michigan Ave, Suite 1600; Chicago, IL 60603.

Florida Bicycle Facilities Planning and Design Manual, 1994. Florida DOT, Pedestrian and Bicycle Safety Office, 605 Suwannee Street, Tallahassee, FL 32399.

Evaluation of Shared-use Facilities for Bicycles and Motor Vehicles, 1996. Florida DOT, Pedestrian and Bicycle Safety Office, 605 Suwannee Street, Tallahassee, FL 32399.

Bicycle and Pedestrian Design Resources
Oregon Bicycle and Pedestrian Plan, 1995. Oregon Department of Transportation, Bicycle and Pedestrian Program, Room 210, Transportation Building, Salem, OR 97310, Phone: (503) 986-3555

Improving Conditions for Bicyclists and Pedestrians, A Best Practices Report, 1998. FHWA, HEP 10, 400 Seventh Street SW, Washington, DC 20590.

Traffic Calming Design Resources
Traffic Calming: State of the Practice. 1999. Institute of Transportation Engineers, 525 School Street, SW, Suite 410; Washington, DC 20024.

Florida Department of Transportation's Roundabout Guide. Florida Department of Transportation, 605 Suwannee St., MS-82, Tallahassee, FL 23299-0450.

National Bicycling and Walking Study. Case Study # 19, Traffic Calming and Auto-Restricted Zones and other Traffic Management Techniques-Their Effects on Bicycling and Pedestrians, Federal Highway Administration (FHWA).

Traffic Calming (1995), American Planning Association, 122 South Michigan Avenue, Chicago, IL 60603

Traditional Neighborhood Development Street Design Guidelines, 1997. Proposed Recommended Practice, Institute of Transportation Engineers, 525 School Street, SW, Suite 410; Washington, DC 20024.

Making Streets that Work, City of Seattle, 600 Fourth Ave., 12th Floor, Seattle, WA 98104-1873, Phone: (206) 684-4000, Fax: (206) 684-5360.

Traffic Control Manual for In-Street Work, 1994. Seattle Engineering Department, City of Seattle, 600 4th Avenue, Seattle, WA 98104-6967, Phone: (206) 684-5108.

ADA-Related Design Resources
Accessible Pedestrian Signals, 1998. U.S. Access Board 1331 F Street NW, Suite 1000; Washington, DC 20004. (800) 872-2253.

Accessible Rights of Way: A Design Manual, 1999. U.S. Access Board, 1331 F Street NW, Suite 1000; Washington, DC 20004. (800) 872-2253.

Designing Sidewalks and Trails for Access, Part One. 1999. FHWA, HEPH-30, 400 Seventh Street SW, Washington, DC 20590.

ADA Accessibility Guidelines for Buildings and Facilities, 1998 (ADAAG). U.S. Access Board, 1331 F Street NW, Suite 1000; Washington, DC 20004. (800) 872-2253.

Uniform Federal Accessibility Standards, 1984 (UFAS), available from the U.S. Access Board, 1331 F Street NW, Suite 1000; Washington, DC 20004. (800) 872-2253

Universal Access to Outdoor Recreation: A Design Guide, 1993. PLAE, Inc., MIG Communications, 1802 Fifth Street, Berkeley, CA 94710. (510) 845-0953.

Recommended Street Design Guidelines for People Who Are Blind or Visually Impaired. American Council of the Blind, 1155 15th Street NW, Suite 720; Washington, DC 20005. (202) 467-5081.

Trail Design Resources
Trails for the 21st Century, 1993. Rails to Trails Conservancy, 1100 17th Street NW, 10th Floor, Washington DC 20036. (202) 331-9696.

Greenways: A Guide to Planning, Design, and Development, 1993. The Conservation Fund. Island Press, 1718 Connecticut Ave NW, Suite 300; Washington, DC 20009.

Trail Intersection Design Guidelines, 1996. Florida Department of Transportation, 605 Suwannee St., MS-82, Tallahassee, FL 23299-0450.

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 Vehicle Code - Bicycle Use of Roadways

The following sections of the California State Code are provided as a reference source concerning the legal implications of operating a bicycle on the roadways within the state of California.

Sections 21200-21212

21200. (a) Every person riding a bicycle upon a highway has all the rights and is subject to all the provisions applicable to the driver of a vehicle by this division, including, but not limited to, provisions concerning driving under the influence of alcoholic beverages or drugs, and by Division 10 (commencing with Section 20000), Section 27400, Division 16. 7 (commencing with Section 39000), Division 17 (commencing with Section 40000. 1), and Division 18 (commencing with Section 42000), except those provisions which by their very nature can have no application. (b) (1) Any peace officer, as defined in Chapter 4. 5 (commencing with Section 830) of Title 3 of Part 2 of the Penal Code, operating a bicycle during the course of his or her duties is exempt from the requirements of subdivision (a), except as those requirements relate to driving under the influence of alcoholic beverages or drugs, if the bicycle is being operated under any of the following circumstances:

(A) In response to an emergency call.

(B) While engaged in rescue operations.

(C) In the immediate pursuit of an actual or suspected violator of the law.

(2) This subdivision does not relieve a peace officer from the duty to operate a bicycle with due regard for the safety of all persons using the highway.

21200. 5. Notwithstanding Section 21200, it is unlawful for any person to ride a bicycle upon a highway while under the influence of an alcoholic beverage or any drug, or under the combined influence of an alcoholic beverage and any drug. Any person arrested for a violation of this section may request to have a chemical test made of the person's blood, breath, or urine for the purpose of determining the alcoholic or drug content of that person's blood, and, if so requested, the arresting officer shall have the test performed. A conviction of a violation of this section shall be punished by a fine of not more than two hundred fifty dollars ($250). Violations of this section are subject to Section 13202. 5.

21201. (a) No person shall operate a bicycle on a roadway unless it is equipped with a brake which 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 his hands above the level of his shoulders in order to grasp the normal steering grip area.

(c) No person shall operate upon any highway a bicycle which 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 (1) with a lamp emitting a white light which, while the bicycle is in motion, illuminates the highway in front of the bicyclist and is visible from a distance of 300 feet in front and from the sides of the bicycle; (2) with a red reflector on the rear which shall be visible from a distance of 500 feet to the rear when directly in front of lawful upper beams of headlamps on a motor vehicle; (3) with a white or yellow reflector on each pedal visible from the front and rear of

the bicycle from a distance of 200 feet; and (4) with a white or yellow reflector on each side forward of the center of the bicycle, and with a white or red reflector on each side to the rear of the center of the bicycle, except that bicycles which are equipped with reflectorized tires on the front and the rear need not be equipped with these side reflectors. Such reflectors and reflectorized tires shall be of a type meeting requirements established by the department.

(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 lieu of the lamp required by clause (1) of subdivision (d).

21201. 5. (a) No person shall sell, or offer for sale, a reflex reflector or reflectorized tire of a type required on a bicycle unless it meets requirements established by the department. If there exists a federal Consumer Product Safety Commission regulation applicable to bicycle reflectors, the provisions of that regulation shall prevail over provisions of this code or requirements established by the department pursuant to this code relative to bicycle reflectors.

(b) No person shall sell, or offer for sale, a new bicycle that is not equipped with a red reflector on the rear, a white or yellow reflector on each pedal visible from the front and rear of the bicycle, a white or yellow reflector on each side forward of the center of the bicycle, and a white or red reflector on each side to the rear of the center of the bicycle, except that bicycles which are equipped with reflectorized tires on the front and rear need not be equipped with these side reflectors.

(c) Area reflectorizing material meeting the requirements of Section 25500 may be used on a bicycle.

21202. (a) Any person operating a bicycle upon a roadway at a speed less than the normal speed of traffic moving in the same direction at 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 vehicle proceeding in the same direction.

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

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

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

21203. No person riding upon any motorcycle, motorized bicycle, bicycle, coaster, roller skates, sled, or toy vehicle shall attach the same or himself to any streetcar or vehicle on the roadway.

21204. (a) No person operating a bicycle upon a highway shall ride other than upon or astride a permanent and regular seat attached thereto.

(b) No operator shall allow a person riding as a passenger, and no person shall ride as a passenger, on a bicycle upon a highway other than upon or astride a separate seat attached thereto. If the passenger is four years of age or younger, or weighs 40 pounds or less, the seat shall have adequate provision for retaining the passenger in place and for protecting the passenger from the moving parts of the bicycle.

21205. 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.

21206. This chapter does not prevent local authorities, by ordinance, from regulating the registration of bicycles and the parking and operation of bicycles on pedestrian or bicycle facilities, provided such regulation is not in conflict with the provisions of this code.

21207. (a) This chapter does not prohibit local authorities from establishing, by ordinance or resolution, bicycle lanes separated from any vehicular lanes upon highways, other than state highways as defined in Section 24 of the Streets and Highways Code and county highways established pursuant to Article 5 (commencing with Section 1720) of Chapter 9 of Division 2 of the Streets and Highways Code.

(b) Bicycle lanes established pursuant to this section shall be constructed in compliance with Section 891 of the Streets and Highways Code.

21207. 5. Notwithstanding Sections 21207 and 23127 of this code, or any other provision of law, no motorized bicycle may be operated on a bicycle path or trail, bikeway, bicycle lane established pursuant to Section 21207, equestrian trail, or hiking or recreational trail, unless it is within or adjacent to a roadway or unless the local authority or the governing body of a public agency having jurisdiction over such path or trail permits, by ordinance, such operation.

21208. (a) Whenever a bicycle lane has been established on a roadway pursuant to Section 21207, 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 within the bicycle lane, except that such person may move out of the lane under any of the following situations:

(1) When overtaking and 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 reasonably necessary to leave the bicycle lane to avoid debris or other hazardous conditions.

(b) No person operating a bicycle shall leave a bicycle lane until the movement can be made with reasonable safety and then only after giving an appropriate signal in the manner provided in Chapter 6 (commencing with Section 22100) in the event that any vehicle may be affected by the movement.

21209. (a) No person shall drive a motor vehicle in a bicycle lane established on a roadway pursuant to Section 21207 except as follows:

(1) To park where parking is permitted.

(2) To enter or leave the roadway.

(3) To prepare for a turn within a distance of 200 feet from the intersection.

(b) This section does not prohibit the use of a motorized bicycle in a bicycle lane, pursuant to Section 21207. 5, at a speed no greater than is reasonable or prudent, having due regard for visibility, traffic conditions, and the condition of the roadway surface of the bicycle lane, and in a manner which does not endanger the safety of bicyclists.

21210. 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, by ordinance or resolution, prohibit bicycle parking in designated areas of the public highway, provided that appropriate signs are erected.

21211. (a) No person shall stop, stand, sit, or loiter upon any class I bikeway, as defined in subdivision (a) of Section 890. 4 of the Streets and Highways Code, or any other public or private bicycle path or trail, if the stopping, standing, sitting, or loitering impedes or blocks the normal and reasonable movement of any bicyclist.

(b) No person shall place or park any bicycle, vehicle, or any other object upon any bikeway or bicycle path or trail, as specified in subdivision (a), which impedes or blocks the normal and reasonable movement of any bicyclist unless the placement or parking is necessary for safe operation or is otherwise in compliance with the law.

(c) This section does not apply to drivers or owners of utility or public utility vehicles, as provided in Section 22512.

(d) This section does not apply to owners or drivers of vehicles who make brief stops while engaged in the delivery of newspapers to customers along the person's route.

21212. (a) A person under 18 years of age shall not operate a bicycle, or ride upon a bicycle as a passenger, upon a street, bikeway, as defined in subdivision (a) of Section 2373 of the Streets and Highways Code, or any other public bicycle path or trail unless that person is wearing a properly fitted and fastened bicycle helmet that meets the standards of the American National Standards Institute (ANSI Z 90. 4 bicycle helmet standard) or the Snell Memorial Foundation's Standard for Protective Headgear for Use in Bicycling. This requirement also applies to a person who rides upon a bicycle while in a restraining seat that is attached to the bicycle or in a trailer towed by the bicycle.

(b) Any helmet sold or offered for sale for use by operators and passengers of bicycles shall be conspicuously labeled in accordance with the standard described in subdivision (a) which shall constitute the manufacturer's certification that the helmet conforms to the applicable safety standards.

(c) No person shall sell, or offer for sale, for use by an operator or passenger of a bicycle any safety helmet which is not of a type meeting requirements established by this section.

(d) (1) A person who violates a requirement of this section in 1994 shall be warned of the violation by the enforcing official, but shall not be issued a notice to appear.

(2) Any charge under this subdivision shall be dismissed when the person charged alleges in court, under oath, that the charge against the person is the first charge against that person under this subdivision, unless it is otherwise established in court that the charge is not the first charge against the person.

(e) Except as provided in subdivision (d), a violation of this section is an infraction punishable by a fine of not more than twenty-five dollars ($25). The parent or legal guardian having control or custody of an unemancipated minor whose conduct violates this section shall be jointly and severally liable with the minor for the amount of the fine imposed pursuant to this subdivision.

(f) Notwithstanding Section 1463 of the Penal Code or any other provision of law, the fines collected for a violation of this section shall be allocated as follows:

(1) Seventy-two and one-half percent of the amount collected shall be deposited in a special account of the county health department, to be used for bicycle safety education and for assisting low-income families in obtaining approved bicycle helmets for children under the age of 18 years, either on a loan or purchase basis. The county may contract for the implementation of this program, which, to the extent practicable, shall be operated in conjunction with the child passenger restraint program pursuant to Section 27360.

(2) Two and one-half percent of the amount collected shall be deposited in the county treasury to be used by the county to administer the program described in paragraph (1).

(3) If the violation occurred within a city, 25 percent of the amount collected shall be transferred to and deposited in the treasury of that city. If the violation occurred in an unincorporated area, this 25 percent shall be deposited and used pursuant to paragraph (1).