OCEANSIDE

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ENCINITAS

SOLANA BEACH

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SAN DIEGO

COASTAL RAIL TRAIL
Project Study Report

FINAL

October 2000

Final Draft

Project Study Report

Coastal Rail Trail

Prepared for:

City of Carlsbad
City of Del Mar
City of Encinitas
City of Oceanside
City of San Diego
City of Solana Beach

In Conjunction With:

California Department of Transportation
Marine Corps Air Station Miramar
North San Diego County Transit Development Board
San Diego Association of Governments
San Diego Metropolitan Transit Development Board

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Chapter One
Project Scope

The Coastal Rail Trail is a proposed multi-use pathway to be located within the San Diego Northern Railway right-of-way. The trail will traverse from the San Luis Rey River in Oceanside, to the Santa Fe Depot in San Diego, connecting transit stations with a paved Class I bikeway for non-motorized users. The project is located within the jurisdictions of six coastal cities in San Diego County. Each of the six cities, Oceanside, Carlsbad, Del Mar, Encinitas, Solana Beach, and San Diego combined their efforts to pursue development of the trail. Participation from the six cities, North San Diego County Transit Development Board (NSDCTDB), the Metropolitan Transit Development Board (MTDB), San Diego Association of Governments (SANDAG), California Department of Transportation (CalTrans) and MCAS Miramar resulted in the preparation of this Project Study Report.

This report is intended to serve as a guide by each agency in developing the Coastal Rail Trail within their city. The report documents the project history; identifies potential users and their needs; analyzes constraints and environmental impacts; offers potential solutions; identifies constructable alignments and costs; and illustrates design guidelines relative to liability, safety, landscaping, maintenance, and CalTrans "Best Practices" for Class I bike paths.

Chapter Two
Goals and Objectives

The Coastal Rail Trail is primarily located along the coastline, following along the old AT&S.F. railroad right-of-way, now owned by the San Diego Northern Railway (SDNR). Formal and informal trails along the railway have been in existence since communities first began developing along this 44-mile corridor. Community interest to develop a formal trail, prompted the San Diego Association of Governments (SANDAG) to sponsor a grant application to conduct the "Coastal Corridor Bicycle Path Analysis" in 1989. The study concluded that a formal trail was feasible for the entire distance from Oceanside to San Diego.

Continued interest by the cities and communities along the corridor coincided with an increase of available federal funding for bicycle facilities through the Intermodal Surface Transportation Efficiency Act (ISTEA). Once again, SANDAG sponsored the application on behalf of the coastal cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, and San Diego, with the City of Carlsbad serving as the lead agency. Twenty percent matching state funds augmented the Congestion Mitigation Air Quality (CMAQ) grant, a program of ISTEA. Once the grant was awarded, the cities teamed together cooperatively to explore opportunities and constraints of the Coastal Rail Trail. The concept of the path was presented to over 50 community groups for their input. Monthly meetings, coordinated by the City of Carlsbad, were conducted for over 30 months to identify issues, alignment, and design questions. The recommendations of the committee are presented in this report.

Chapter Three
Need and Purpose

San Diego County's 1995 population of over 2.6 million persons is expected to increase by 44% to over 3.8 million persons by the year 2020. As the population continues to rise, the need for both commuting and recreation facilities also continues to rise. In 1994, the County of San Diego completed a survey to determine why more people do not ride bicycles. The study concluded that 65% would ride, if there were trails that were separated from the roadway.

The California Outdoor Recreation Plan[1] ranks trail uses as one of the highest in the activity participation survey. The Coastal Rail Trail will directly or indirectly serve virtually all of the regional and local destinations along the corridor. These destinations may be a local city park or a regional destination such as the Del Mar Racetrack. The trail will be designed for commuting and recreation. The anticipated major uses are bicycling, walking, running, and roller blading for individuals, groups, families, and tourists. Bicycling and running fundraising events may also frequently occur along this trail.

In order to estimate the number of future trail users and the reduction of vehicle trips, several assumptions were made about the potential users and the Coastal Rail Trail itself, which included peak season, and off season usage. Based on a series of stated assumptions, the trail usage projections are estimated at over 7 million annually, with reduced vehicle trips of 570,000.

Projections of usage by commuters is derived from the 1990 Census "Journey to Work" data. The current percentage of employed adults who walk to work is approximately 3-4%, while bicyclists comprise about 1% of commuters. Based on the "National Walking and Bicycling Study" conducted by the U. S. Department of Transportation, it is estimated that once the Coastal Rail Trail is complete, the number of bicycle commuters will double. This translates into an estimated 15,000 employed adult commuters who will walk or ride to work on a typical weekday. Add to this figure an estimated 15% of students who will walk or ride, the total daily number of commuters walking or bicycling along the Coastal Rail Trail corridor is projected to be 22,500.

Chapter Four
Implementation

Upon adoption of the Project Study Report, the participating agencies will need to resolve issues related to funding, access agreements, project management, and maintenance operation.

Funding
Funding for planning and environmental research, and partial funding for permitting, design, and construction of the Coastal Rail Trail has been achieved through state and federal grants resulting in a total of approximately eight (8) million dollars. Funding through other grant sources will need to be pursued in order to achieve project implementation and to fund additional amenities such as landscaping and overcrossings. Funding sources for ongoing maintenance and operation

[1] State of California, The Resource Agency California Outdoor Recreation Plan, 1996

may be realized through the general funds of each of the agencies, donations, fundraisers and the use of voluntary manpower.

Agreements
A Memorandum of Understanding (MOU) was established to provide a cooperative arrangement to plan, design, and construct the Coastal Rail Trail. The signatory agencies are the cities of Carlsbad, Del Mar, Encinitas, Oceanside, San Diego, Solana Beach, NCTD and MTDB.

Agreements between each agency and the property owner of the railroad right-of-way will allow for public use of the railroad. The City of Solana Beach and NCTD have taken the lead in the preparation of an "Agreement For Use of Portions of the Railroad Right-of-Way", which will guide other similar agreements.

Trail Management
Trail Management consists of design, construction, maintenance and monitoring, which may be accomplished in several ways: 1) Each agency can manage the trail within their own jurisdiction; 2) One agency can provide project management for the entire trail; or 3) An independent non-profit organization can manage the entire trail. There are various advantages and disadvantages of each option, which may affect trail design, liability and cost.

Project Costs
The Project Study Report has attempted to develop trail guidelines to assist in designing the trail. Adherence to these guidelines and CalTrans standards will provide a coordinated trail system, which is easier to maintain. It is understood that each agency may vary from the guidelines to meet specific community concerns and site constraints. However, there are a number of design components that can be standardized such as trail design, paving, striping, and signing. These standardized elements were used to develop the overall cost estimates. In some areas where there are known variables, such as bridges or fencing, the cost was adjusted accordingly. These costs may vary as each city (or cities) proceeds into the final design phase and modifies specific design elements. Optional costs, such as benches, picnic tables, bicycle racks, landscaping, irrigation, etc., are summarized for each city, but are not included in the overall cost estimate. The entire Coastal Rail Trail through six jurisdictions is estimated to cost approximately $40,018,893.

Chapter Five
Trail Alignment

The main purpose of the Project Study Report is to identify an alignment which is constructable, not cost prohibitive, and which maintains the continuity of a commuter route from Oceanside to San Diego. An alternative analysis of the corridor was conducted through extensive fieldwork, map analysis, and coordination with resource agencies. The recommended alignment presented in this report was made considering cost constraints, potential environmental impacts, and potential users. This alignment reflects a Class I bike path along the San Diego Northern Railway for approximately 32-miles of the 44-mile corridor. In instances where the railroad bridges across a lagoon, the trail diverts to existing Class II bike lanes along Highway 101 (Coast Highway). The

trail also diverts to either Class II or Class III bike facilities in areas where there may be other constraints that restrict the ease of construction.

The 44-mile Coastal Rail Trail alignment has been divided into 11 distinct project segments for closer evaluation. The methodology used to select the preferred alignment includes the following criteria:

- Available width of railroad right-of-way;
- Physical obstructions along railroad right-of-way;
- Access to transit stations;
- Utilization of existing facilities;
- Environmental constraints; and
- Costs.

Upon completion of this draft document, environmental studies were conducted that resulted in adjustments to the trail. Essentially, the trail was relocated to existing roadways when the biological studies revealed environmental restrictions which would make the trail, as a Class I bicycle path, unfeasible. It is anticipate that minor adjustments to the trail alignment will occur during final design to accommodate existing utilities and elevation changes.

Chapter Six
Trail Design

The design of the rail trail is based on specific standards or guidelines developed for multi-use trails throughout the United States and incorporate CalTrans, Chapter 1000, Bikeway Planning and Design Standards. However, there are no "best practices" design standards developed for rails with trails. The recommended design standards developed in this document are drawn from experiences of active rail trails around California and the United States, accepted CalTrans Class I standards, the California Public Utilities Commission Standards, and unique constraints of the Coastal Rail Trail. Specific designs for at-grade trail crossings will be developed during the final design with consultation with NCTD and the Public Utilities Commission (PUC).

Chapter Seven
Signing and Marking

The Coastal Rail Trail will be identified by a consistent, unique logo, which is represented on the front cover and in this chapter. The fundamental concept of the logo is a striped pattern for railroad ties, simulating the shape of a wave, which curves around each local agency's city seal. This sign, or one similar, will be used along the entire 44-mile corridor to provide identification and continuity. Mileage markers will be identified within the pavement reflecting both northbound and southbound distances. Other types of signs will be educational and directional kiosk signs, bicycle signs consistent with CalTrans standards, and trail information sign panels to identify potential safety hazards and regulations for the use of the trail.

Chapter Eight
Landscaping Along the Trail

Depending on corridor width and trail distance from the rail, fencing and other buffering methods, such as vegetation, are often used to separate a rail trail from adjacent active railroads. Landscaping along the trail will be determined by each local jurisdiction depending on the width of the right-of-way and coordination with the railroad operators. The need for, type of, and distances of buffering between active railroad lines and rail trails are currently being reviewed at the state and national level. Upon adoption of state and/or national standards, buffering issues as well as at-grade crossing standards will be largely defined. The use of buffering techniques along the Coastal Rail Trail will be determined jointly with SDNR during the final design phase, based on site specifics such as distance to the tracks, environmental impacts, view obstruction, lateral movement, and overall safety.

In order to provide design continuity within the corridor, landscape designs, which express the natural and cultural elements of the local environment, have been identified in this chapter. The landscape guidelines focus on the urban and more native environment. Various types of planting are portrayed, some that may be used in more constrained areas and others that may be used in a wider area.

Chapter Nine
Liability of Rails with Trails

Liability is the greatest concern expressed by local agencies that manage trails. Liability cases generally involve perceived negligence. Potential liability issues related to the proposed rail trail have been examined in cooperation with the legal counsel for the Rails to Trails Conservancy. Research into relevant liability issues, comparable facilities around the country, and steps that local jurisdictions can take to minimize their exposure are documented in this section. Based on prior research - when properly designed, maintained, and operated - rail trails have not posed a greater liability risk than other public facilities.

Chapter Ten
Constraints Analysis

An extensive review of existing, related environmental documents was conducted, which provides a benchmark for what additional environmental review will be needed to comply with California Environmental Quality Act (CEQA) and National Environmental Protection Act (NEPA). This review involved analyzing numerous EIR/EIS documents for projects along the corridor to determine what information may be used without having to repeat work that already has been completed. A Natural Diversity Database Record Search was conducted to reveal potential sensitive plant and animal species which may exist along the proposed alignment. Once this data was analyzed, a data gap analysis concluded that additional studies were necessary to determine potential impacts. Since the initial constraints analysis, the City of Carlsbad, conducted additional environmental analysis on noise, cultural resources and biological resources. Due to

potential impacts to native habitats, in some areas the trail was realigned to use existing roadway. In 2000, the City of Carlsbad, on behalf of the northern coastal cities of Oceanside, Encinitas, Solana Beach, and Del Mar completed environmental analysis for the Coastal Rail Trail within the 5 northern coastal cities and issued a Mitigated Negative Declaration for public review in November 2000.

1.0 Project Scope

1.1 Project Description

The Coastal Rail Trail is intended to be a Class I paved bikeway-constructed 12' wide, with 2' shoulders on each side, within the SDNR right-of-way for approximately 32 miles of the total 44 miles. The trail will begin at the San Luis Rey River and terminate at the Santa Fe Depot. Segments located on adjacent roadways will meet the CalTrans Standards for bikeways. Specific design details are identified in Chapter 6.

1.2 Background

The San Diego County coast is defined by the ocean, beaches, lagoons, and communities that line its shores. Despite rapid growth over the past 20 years, the coastal cities still maintain a 'beach' atmosphere, which San Diegans cherish. Evidence of the desire to connect to the water is evident by the numerous paths and trails leading to the beaches, some attracting visitors from the region and beyond, while other trails are known mostly by the local residents. Everyday these paths and trails, along with roadways such as the Pacific Coast Highway, are heavily used by surfers, families, joggers, bicyclists, and many others.

The former Atchison, Topeka and Santa Fe Railroad (AT&S.F.), now owned by the San Diego Northern Railway (SDNR) and operated by the North County Transit District (NCTD), is a defining feature of the area. The Coaster, AT&S.F. freight, and AMTRAK trains provide a level of rail service rare on the West Coast. Trains traveling at speeds of up to 90 mph operate from downtown San Diego to Oceanside, with connections, to Los Angeles and Santa Barbara. Bicyclists can take their bikes on board the trains for no additional charge. New stations along the corridor have become the focal point of downtown redevelopment and increased vitality, thereby increasing rail usage as these developments occur.

These two features, the beaches and the railroad, provide the corridor for the Coastal Rail Trail. As shown in Figure 1.1, the railroad follows the coastline for much of its distance. Portions of railroad right-of-way continue to be heavily used by pedestrians, bicyclists and other users, which is unauthorized by SDNR. The railroad links directly to many local and regional destinations, from parks and beaches to shopping areas to employment centers.

In May of 1989, the engineering consulting firm of Morrison-Knudson completed the "Coastal Corridor Bicycle Analysis"[2] under contract with the San Diego Association of Governments (SANDAG). This study identified design and right-of-way concerns and discussed safety issues related to rail and bicycle operation. The study concluded that it is technically feasible to construct a multi-use path along the railroad nearly its full length from Oceanside to San Diego. (Coastal Corridor Bicycle Path Analysis, pp. 1-2)

[2] "San Diego-Oceanside Commuter Rail Study, Coastal Corridor Bicycle Path Analysis" prepared by Morrison-Knudsen Engineers, Inc., San Diego Association of Governments, May 1989.

Continued interest by the cities and communities along the corridor coincided with an increased availability of federal funding for development of bicycle and pedestrian facilities through the Intermodal Surface Transportation Efficiency Act (ISTEA). In 1992, SANDAG, in association with the coastal cities of Carlsbad, Oceanside, Encinitas, Solana Beach, Del Mar and San Diego, sponsored an ISTEA funding application to conduct a detailed feasibility study. The grant was awarded, and together with an additional grant through a State of California funding project, Transportation Systems Management, the cities embarked on a major effort to plan, design, and construct the longest, continuous rail trail of its type in the country.

This major effort to develop a comprehensive feasibility study is packaged into a Project Study Report. Federal funding of the project mandates oversight by the California Department of Transportation (CalTrans). CalTrans has established a well-defined process for the development of regional transportation improvements. The first step in the process is the development of a Project Study Report (PSR). The PSR explores and identifies most aspects of the project development including purpose and need, public review process, environmental process, funding, agreements, and design options involving opportunity and constraint analysis. The purpose of this Project Study Report (PSR) is to:

- provide background on the project history, goals, and relationship to existing plans and other relevant documents;
- identify the future Coastal Rail Trail users and their needs;
- identify constraints and recommended solutions including grade crossings, environmental conditions, property ownership, and railroad operations;
- develop alternative alignments where constraints cannot be overcome in either the short or long-term;
- develop design guidelines to facilitate development and ensure consistency across cities utilizing established state and national standards;
- provide implementation details on funding, liability, safety, landscaping, maintenance, legal agreements, environmental permits, and other items; and
- provide a forum for resolving planning and design issues to developing construction documents.

Rail trails have been constructed throughout the nation. The Rails to Trails Conservancy (RTC), a nationwide organization formed for the purpose of utilizing abandoned railways for trails is now assisting in the development of trails along active railways. A survey conducted by RTC in 1997 lists 49 existing rails-with-trail and provides detailed information on the physical and operating characteristics of the facilities. The study summary states that trails are compatible with active railroads and concludes that these trails are successful alternatives for transportation and provide an ideal opportunity for recreation.

As the Coastal Rail Trail progresses, other communities are pursuing rail trails in their own communities. The San Mateo County Transportation Authority in San Mateo County recently completed a Feasibility Study for the development of a rail trail along a 27-mile rail corridor. Washington D. C. conducted the "Met Branch Feasibility Study" for a 7-mile trail from Union Station and the Mall in Washington D. C., to Silver Spring in Montgomery County, Maryland and has completed a portion of the trail through Northeast Washington bordering a Catholic University. Minneapolis' Cedar Lake Trail, which parallels an active rail line is about two-thirds complete. Other cities such as Ventura, San Luis Obispo, San Clemente, and Cincinnati, are proceeding with preliminary plans. In other areas, rail trails are success.f.ul, such as the Georgetown Branch Trolley Trail, which connects Bethesda, Chevy Chase, and Silver Springs, Maryland. The Mission Trail in San Fernando, California is located next to the Metrolink, an active rail corridor. The trail, a paved pathway separated by a 5' high fence, channelizes bicyclists and pedestrians to the trail where in the past the corridor had a high rate of people walking on the rail.

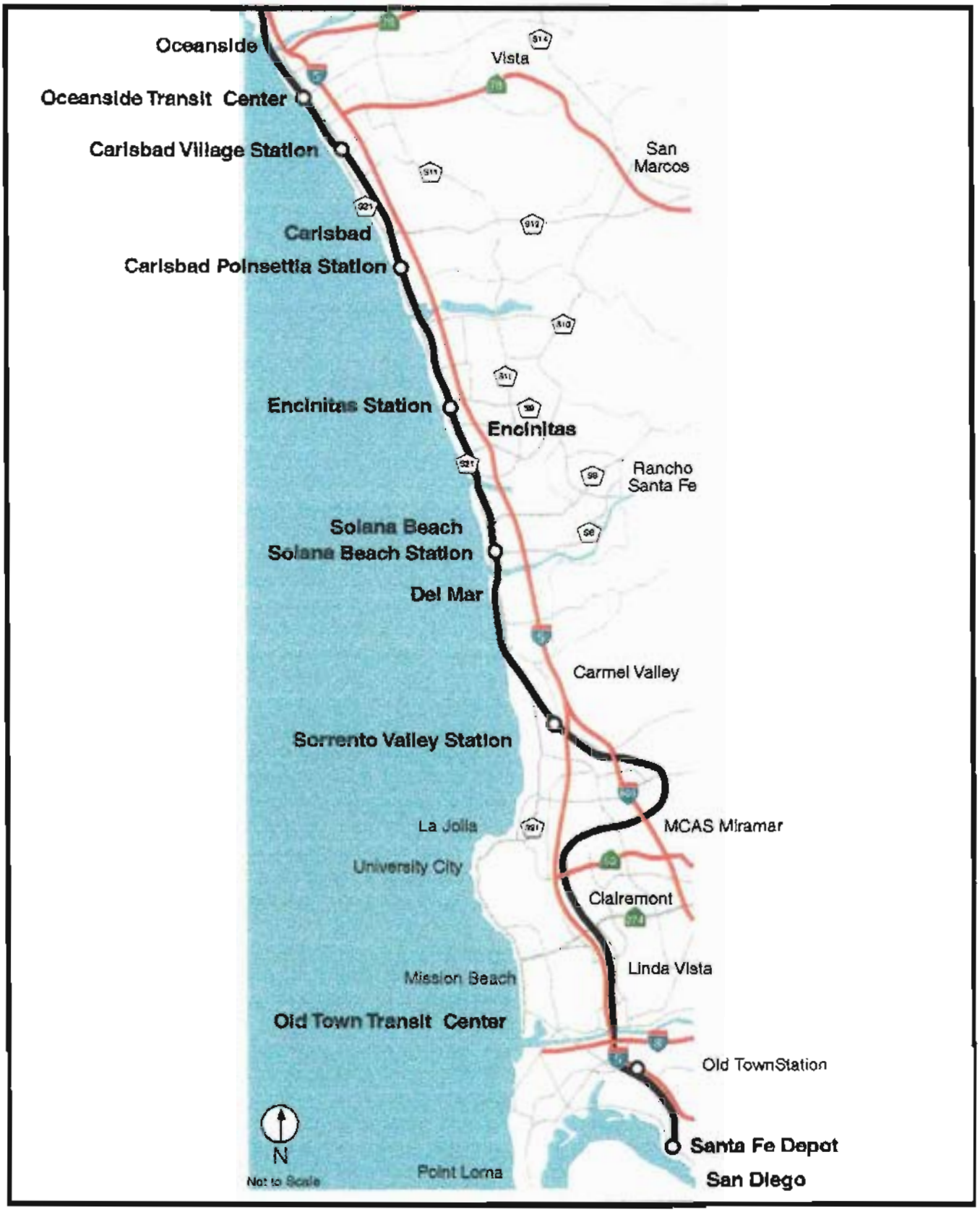

FIGURE 1.1	RAIL TRAIL CORRIDOR	COASTAL RAIL TRAIL

1.3 Project Setting and History

The project study area includes the central and northern parts of the City of San Diego, and the cities of Del Mar, Solana Beach, Encinitas, Carlsbad, and Oceanside. Total population of these communities was over 1.4 million in 1995 and projected to increase to 2 million by 2020. The topography of the study area ranges from a level marine plateau in the north to rugged hills with arroyos and canyons between Del Mar and San Diego. Salt-water lagoons (Batiquitos, Agua Hedionda, San Elijo, San Dieguito and Los Penasquitos) and the fresh water Buena Vista lagoon accentuate the terrain. The land uses along the railroad consist of medium to low density housing, industrial and commercial land uses. Large undeveloped land tracts exist around the lagoons in Carlsbad, and in north San Diego. Intense commercial development, including high-rise office buildings and heavy industrial uses, border the railway through downtown San Diego and Sorrento Valley.

The north-south transportation system is dominated by three major facilities: (a) the I-5 freeway which is located between 1 and 5 miles inland from the coast, (b) the former Pacific Coast Highway, known as the Coast Highway, Carlsbad Boulevard, and Pacific Highway, which traverses parallel to the shoreline from Oceanside to Del Mar, and (c) the SDNR railway right-of-way, which is generally located between the Pacific Coast Highway and I-5 except through Carmel Valley, Rose Canyon, and the Marine Corps Air Station at Miramar.

Informal trails along the San Diego Northern Railway right-of-way have been in existence since communities began to develop along the coast. Walking or jogging within the right-of-way and crossing the tracks at unprotected locations is considered trespassing by the railroad. SDNR has attempted to keep people off the tracks by posting warning signs every 600 feet and issuing tickets. Since SDNR purchased the railway, NCTD has provided security personnel who patrol the corridor to cite individuals for violations such as walking on the railway, placing rocks on the tracks, and crossing the tracks at unprotected crossings.

Since the initial feasibility study (Coastal Corridor Bicycle Analysis, 1989) was completed, several conditions have changed. First, the AT&S.F. sold the north county portion of the railroad to NCTD and the San Diego portion to MTDB in December 15, 1992. The railroad line known as the SDNR, leased trackage rights for freight operations back to the Santa Fe Railroad, while commuter service is provided by NCTD between Oceanside and San Diego with the bi-directional Coaster trains. Metropolitan Transit Development Board provides "Trolley" service, a light rail train connecting Old Town San Diego to the Santa Fe Depot and to Tijuana, Mexico. Recent improvements to the Trolley service include connections to Mission Valley and Qualcomm Stadium (previously named Jack Murphy Stadium). AMTRAK provides inter-city passenger service to Los Angeles and points beyond. Additional commuter service may soon become available by Southern California Regional Rail Authority (SCRRA) who operates the Metrolink rail service throughout Los Angeles and Orange Counties.

Continued interest by the cities and communities along the corridor coincided with increased available federal funding for bicycle facilities through the Intermodal Surface Transportation

Efficiency Act (ISTEA). In 1992, SANDAG's Bicycle Facilities Coordinating Committee (BFCC) sponsored an ISTEA funding application for $768,000 in Congestion Mitigation and Air Quality (CMAQ) funding for a 44-mile Coastal Rail Trail. The application was success.f.ul. The 20% match funding was provided by the state with $192,000 from Transportation Systems Management (TSM) funds.

In 1996, feasibility and preliminary design study of the Coastal Rail Trail was begun by a consultant team headed by Transtech Engineers, Inc. of Oceanside, California, culminating in this Project Study Report (PSR). Design and construction of the Coastal Rail Trail will occur in phases, with the design of the Solana Beach segment is scheduled for fall 2000 and Oceanside through Encinitas in 2001. Completion of the entire alignment is subject to funding availability, resolution of environmental issues, and public access agreements (see Section 4.2).

2.0 Goals and Objectives

2.1 Project Goals

ISTEA funding, which is being used to design and construct the Coastal Rail Trail, is intended to benefit alternative transportation. The federal government considers a bike trip as being used for transportation purposes, if it connects an origin to a destination. Alternative transportation is defined as any trip that results in a reduction in vehicle trips and vehicle miles traveled in the corridor, ultimately improving air quality in regions designated as severe air quality non-attainment by the Air Pollution Control District (APCD). By linking neighborhoods directly to the transit stations and employment centers, the Coastal Rail Trail will provide an alternative mode of transportation, and will serve a direct function of encouraging commuters to bike or walk to their destinations rather than to drive. Recreation trips, if they replace trips otherwise made by a vehicle, also meet the mission of the ISTEA funding program and achieves goals incorporated into SANDAG's Regional Transportation Improvement Plan (RTIP).

The six cities, in conjunction with, SANDAG, NCTD, MCAS, CalTrans and MTDB developed the following project goals:

Goal 1: Locate, wherever possible, the trail within the railroad right-of-way in order to provide an alternative to using heavily traveled parallel roadways in a safe and legal environment.

Goal 2: The Coastal Rail Trail should be a functional well-planned facility that provides a relatively direct north-south connection in the County, and follows routes already used by bicyclists, pedestrians, and others.

Goal 3: The Coastal Rail Trail should consider connections to existing and proposed trails to further expand alternative transportation choices.

Goal 4: Maximize safety along the railroad corridor by organizing and managing pedestrian and bicycling activity along the railway through appropriate design and operation of the facility.

Goal 5: Preserve the primary use of the SDNR and recognize the desire that future service may require that SDNR double-track the railroad in the future for additional rail service, for additional tracking for the light rail system, and future transit stations.

Goal 6: Preserve existing access routes to beaches and other destinations. Where needed, relocate some access routes to new-channeled crossings.

Goal 7: Protect existing wetlands and other environmentally sensitive habitats along the right-of-way. This may result in the diversion of the Coastal Rail Trail to alternate routes off the railroad corridor.

Goal 8: Design, construct, and maintain the facility to meet appropriate state and federal standards and the intent of the American with Disabilities Act (ADA).

Goal 9: Wherever desirable or due to specific constraints, provide separate treadways for pedestrians and wheeled-users.

Goal 10: Design grade crossings at roadways, which maximize trail user safety and convenience.

2.2 Summary of General Plans and Other Adopted Plans

The project lies within the boundaries of six local jurisdictions, each having their own General Plan, Local Coastal Plan (LCP), implementing elements, ordinances, and policies. Each relative document was reviewed along with regional and statewide goals to determine consistency of the Coastal Rail Trail within each jurisdiction. These included General Plans, and Local Coastal Plans, circulation elements, applicable master plans, specific plans, parks and recreation plans, bikeway master plans, rail service plans, environmental documents, demographic and land use data, traffic volumes, accident data and other reports. A summary of this analysis is presented below including its applicability to the Coastal Rail Trail.

California Coastal Commission

The 1972 California Coastal Act is intended to protect the natural and scenic qualities of the California Coastal Zone. Portions of the Coastal Rail Trail corridor and alternate routes lie within the Local Coastal Program Boundary and are subject to the review of the California Coastal Commission. The California Coastal Act regulations require that a coastal plan include "a public access element for maximum visual and physical use and enjoyment of the coastal zone by the public". It also requires each local government agency to prepare a specific public access component. The Coastal Act policies, which are related to shoreline access, are as follows:

Section 30210. Requires maximum access and broad recreational opportunities for all people in beach and coastal areas.

Section 30211. Requires that new development not interfere with the public's right of access to coastal areas.

Throughout the development of the PSR, the public right of access across the rail corridor has been a great consideration. While the design of the Coastal Rail Trail may mandate buffering, such as landscaping or fencing in some areas to ensure safety, adequate access for the public access at

existing at-grade crossings and highly used corridors must be maintained to ensure coast accessibility.

San Diego Association of Governments (SANDAG)

The San Diego Association of Governments (SANDAG) is mandated to prepare and update the Regional Transportation Plan (RTP) by Section 65080 of the State Government Code. This section also specifies that actions by transportation agencies, including CalTrans and the Transit Development Boards must be consistent with the RTP. Local agencies utilize this document for planning for future transportation facilities, then incorporate the transportation plan into their General Plan Land Use and Circulation Elements. In order to obtain state, federal, or transportation sales tax funding, the project must be consistent with the RTP. The RTP was updated in 1996 to include the Coastal Rail Trail as a regional bicycle facility. [3] The RTP identifies the Coastal Rail Trail as a proposed regional trail stating that the "affected cities and the County of San Diego, with the cooperation of NCTD, will evaluate alternative alignments where needed, complete design and construction of the Coastal Rail Trail."[4]

City of Oceanside

The City of Oceanside is located at the juncture of the north-south SDNR railroad and the east-west Oceanside-Escondido rail. The city has recognized the opportunity that this juncture brings to non-motorized trail use.

General Plan, Circulation Element (1995): The plan identifies two recreational routes for pedestrians and bicycles: the Pacific Coast Trail and the San Diego-Anza Borrego Desert Corridor. The planned location for Desert Corridor is adjacent to the old Santa Fe Escondido Branch line (and future light rail line) running east from Oceanside to Escondido. Another major bike/pedestrian improvement currently under design is the San Luis Rey River Bike Loop, at the northern end of the City. This loop will connect the beach area near the proposed Coastal Rail Trail and Pacific Street, to the inland portions of Oceanside along the San Luis Rey River. Relevant policies include commitments to "assure that transit centers have adequate bicycle and pedestrian access, including secure bicycle storage" (p.52) and "provide connection and continuation of the Pacific Coastal Bicycle Corridor and the San Diego-Anza Borrego Bicycle Corridor" (p. 54).

General Plan, Land Use Element (January 1989): The plan recognizes the need to enhance non-motorized transportation facilities in order to provide safe and efficient movement of people in and through the City of Oceanside. Additionally, Section 2.7132 (p. 63) states that "the City shall encourage the use of the railroad right-of-way for recreation and similar uses."[5]

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[3] 1996 Regional Transportation Plan, September 1996, San Diego Association of Governments, pp 168.

[4] Ibid. pp 176

[5] Oceanside, City of. City of Oceanside General Plan, March 1989

Master Plan of Parks and Recreation (1996): The document focuses entirely on parks and the need for active recreational uses rather than on bikeways or linear corridors. The purpose of the document is to address the needs of the community for new parks, park acquisition, and park operations and maintenance. The railway right-of-way is not designated as an open space corridor or slated for a multi-use path within the land use element.

The Coastal Rail Trail is consistent with the City of Oceanside's goals and objectives, which encourages non-motorized facilities and the use of the railroad right-of-way for recreation and similar uses.

City of Carlsbad

The City of Carlsbad has identified the Coastal Rail Trail in their General Plan and the Bicycle Master Plan. The following documents recognize the opportunity of a trail along the rail right-of-way:

General Plan, Circulation Element: Policy C.19 reads: "Encourage passive and active use of the railroad right-of-way trail linkage and bicycle Coastal Rail Trail." Other policies encourage improvements to both pedestrian and bicycle circulation including safety improvements and expanded facilities.

Bicycle Master Plan (1996): Section 10 of this document recognizes the Coastal Rail Trail as a north-south spine along the coast and a regional connection to east-west trails. The plan includes conceptual solutions to various design issues including bridge crossings, undercrossings, and at-grade crossings.

Buena Vista Lagoon, Hill Street/Carlsbad Boulevard Boardwalk (November 1991): A pedestrian boardwalk is proposed along the eastern side of Carlsbad Boulevard/Coast Highway over the Buena Vista Lagoon connecting Carlsbad and Oceanside. This pedestrian sidewalk would be elevated above street level to provide a pedestrian system around the lagoon edge.

The Coastal Rail Trail is consistent with the City of Carlsbad's General Plan and the Bicycle Master Plan. It does not conflict with the Buena Vista Lagoon Foundation's proposed pedestrian boardwalk for the east side of the Coast Highway, connecting Oceanside and Carlsbad. The Coastal Rail Trail would augment the Carlsbad trail system by providing a route for bicyclists and connections to existing and proposed east-west bicycle and trail routes.

City of Encinitas

The railroad right-of-way within the City of Encinitas experiences a high number of users crossing the tracks to access the beach. This is due in a large part to the limited number of surface streets that cross the tracks, and the large residential areas which border the east side of the tracks in communities such as Leucadia, Old Encinitas, and Cardiff by the Sea. The City of Encinitas goals and objectives are presented in the following documents:

General Plan (1989): The General Plan recognizes the need to retain access to the beaches and the potential of the railroad right-of-way as a resource for a multi-use trail. As stated in the Introduction, Railroad Crossings/Right-of-Way: "The limited number of railroad crossings acts as a deterrent to east-west pedestrian and vehicular movement. This obstacle to movement results in uncontrolled pedestrian crossings of the track wherever it is convenient. The right-of-way represents a significant source of noise, but is also a potentially valuable area for the establishment of a riding/hiking/bicycling path for north-south movement near the coast and a landscaped buffer adjacent to the major north-south circulation roadways, Highway 101 and Vulcan Avenue. Enhancement of the rail corridor, including the possible depression of the track grade to address these issues, is warranted."[6] The General Plan also includes a bikeway facilities map, which identifies a separate bikeway along the railroad right-of-way.

Master Bikeway Plan and Engineering Feasibility Study (1990): This document provides ample detail regarding bicycles, riding habits, and the riders themselves including age, sex, trip purpose, frequency of use, and other information. Most survey respondents in Encinitas identified separate bike paths as their preferred type of bicycle facility. The Plan evaluates the potential for a bike path along the railroad right-of-way, and provides an alternative that includes widening parallel streets for bike lanes (Vulcan/San Elijo) in order to minimize conflicts with pedestrians and other trail users. The 'AT&S.F. Railroad' option is evaluated in three distinct segments, projected to have a 10 to 12 foot width, and be located on the east side of the tracks. Total cost of the facility was projected to be $3.4 million dollars for 5.8 miles of bike path.

Downtown Encinitas Specific Plan (1994): The circulation elements of this plan cover both pedestrian and bicycle movement, with a multi-purpose trail identified along the railroad corridor south from E Street. The plan recommends pursuing development of this facility in cooperation with NCTD.

North 101 Corridor Specific Plan (1997): This plan recommends a "multi-modal recreational path within the railroad right-of-way east of North Highway 101. This bike path will replace the existing narrow asphalt pathway along North Highway 101" The plan also recommends parallel on-street bike lanes on North Highway 101 and Vulcan Avenue.

The Coastal Rail Trail is consistent with the City of Encinitas' General Plan and Master Bikeway Plan, which identify the railway corridor as an opportune area for a multi-use path without reducing the existing bike lanes.

City of Solana Beach

The City of Solana Beach has taken extensive steps to prepare for a trail along the railroad. The city goals and objectives are succinctly stated in the following documents:

Solana Beach Linear Park Master Plan (1995): This document covers the planning and preliminary design of a 1.8-mile linear park along the railroad right-of-way (essentially the same alignment as the proposed Coastal Rail Trail). The plan contains details on the public

[6] Encinitas General Plan, 1989. Pp I-6

involvement process, relevant plans, existing influences such as topography, vegetation, and circulation, conceptual plans, cross sections, and design elements such as lighting, entry features, plazas, fencing, bridges, and landscaping. The plan provides the most detailed design framework for the proposed Coastal Rail Trail in the entire corridor. It includes design recommendations but acknowledges that the specific design of the Linear Park will occur during the final design phase.

Highway 101 Corridor Specific Plan (1992): This plan covers the area adjacent to U.S. 101 through the City and consists of land use, community facilities, and circulation components. There is substantial overlap in this plan's study area and that covered by the more recent Linear Park Master Plan (see above). The plan recognizes the future Linear Park and the need to create better pedestrian linkages across Highway 101 to the Linear Park.

Solana Beach Bikeway Master Plan (1993) and Bikeway Addendum (1996): These plans cover on-street and off-street bicycle facilities in the city, along with support facilities such as bike racks. They identify the 'Coastal Corridor' Class I bike path 'to be built by others' through Solana Beach. They also provide most of the basic information required for state and federal funding, and other tools needed to guide future development of the bikeway system.

EIR for the Proposed Lomas Santa Fe Drive Grade Separation Project for the San Diego Northern Railway, (1995): Jointly, NCTD and the City of Solana Beach developed a plan to lower the train tracks approximately 35 feet below their existing level in order for the trains to pass under the intersection at Lomas Santa Fe Drive and Highway 101. The purpose of this "grade separated railway" is to reduce traffic congestion at Lomas Santa Fe and noise impacts to adjacent residential and commercial properties. As part of the "Lomas Santa Fe Grade Separation Project," the City pursued the development of a linear park along the railway right-of-way for the purpose of creating a parklike setting, to provide a formal trail for pedestrian and bicyclists, and to continue to reduce conflicts with bicyclists and vehicles.

The design criteria set forth in the Coastal Rail Trail Project Study Report support the policies identified in the City's General Plan (1988), the Fletcher Cove Master Plan and supporting EIR (1992), Linear Park Master Plan, Bikeway Master Plan (1993), and Bikeway Addendum (1996).

City of Del Mar

The City of Del Mar recognizes the need to provide alternative transportation, but also the need to preserve the coastal bluffs along the railroad. These policies and goals are identified in the following documents:

General Plan, Recreation Element (May 1, 1985): Promotes the use of bicycle facilities and trails. Section C of the Implementation Program recommends that a continuous bluff-top pedestrian trail be developed.

The Community Plan (March 1996): Open space goals recognize the need to preserve the sandstone bluffs, which lie along the coast of Del Mar. These bluffs receive extensive pedestrian activity year round, as well as host the San Diego Northern Railway. The Community Plan, Goal

2, Objectives and Policies A reads: "encourage a pedestrian-oriented, non-motorized community by developing a system of bicycle rights-of-way and pedestrian paths.

Zoning Code, Railroad Right-of-Way Zone (1985): The City of Del Mar's zoning code (Chapter 30.28) specifically states that the uses within the railroad right-of-way are limited to railroad transportation facilities and related structures and uses. Since the proposed trail along the right-of-way in Del Mar is limited to an unimproved pedestrian trail, the proposed Coastal Rail Trail is consistent with this zoning code.

Camino Del Mar Streetscape Plan (September 6, 1996): The intent of the plan is to consider specific design modifications which will enhance the three mile length of Camino Del Mar through the City of Del Mar. The plan maintains the need for bicycle lanes through the City and identifies a bicycle/pedestrian bridge at the Jimmy Durante - Grand Avenue/Camino Del Mar merge.

Del Mar Trail Subcommittee (December 1996): The City of Del Mar's City Council directed its staff to work with community groups in the development of the Coastal Rail Trail and to explore trail alternatives. The trail subcommittee considered a paved bicycle/pedestrian trail along the railroad right-of-way, however, due to width and drainage constraints along the bluffs and known bluff instability, the committee agreed to divert bicyclists to existing bicycle lanes on Camino del Mar while maintaining existing pedestrian paths along the west side of the railway, on top of the bluffs.

The Coastal Rail Trail is consistent with the City of Del Mar's programs and policies since it encourages the preservation of the coastal bluffs and the continued use of the existing trails and bicycle lanes. It also includes the location of the pedestrian bridges across the railway as proposed by the City Council Trail Subcommittee and the proposed bicycle bridge at the Jimmy Durante - Grand Avenue/Camino del Mar merge.

City of San Diego

The Coastal Rail Trail traverses through and is adjacent to several City of San Diego planning areas. Development in these areas is controlled by community adopted plans. These include the North City West Community Plan (a.k.a. Carmel Valley), Torrey Pines Community Plan, University City Community Plan, Mira Mesa Community Plan and the Local Coastal Program (LCP). Summaries of these and other relevant documents follow:

Progress Guide and General Plan (1989): The City of San Diego's General Plan recognizes that walking and bicycling are both important means of transportation in San Diego. It states "the pedestrian and bicycle trips each exceed the number of trips made by transit today. Moreover, travel forecasts indicate that non-motorized transportation will increase significantly and will continue to outpace transit ridership."[7] The plan also encourages separate bikeway facilities to reduce vehicle conflicts and recognizes the coastal bikeway as a regional corridor for bicyclists.

[7] City of San Diego Progress Guide and General Plan, 1989, pp 262.

North City West Community Plan (October 1988): Although the North City West Community Plan is located immediately to the east of the City of Del Mar, bike and pedestrian ways are recommended to be parallel to major and collector streets but to be physically separated and connected to community activity centers. The Coastal Rail Trail will allow for connections to bike paths constructed in the North City West area.

Torrey Pines Community Plan (April 16, 1996): Transportation Element Goals identify three Class I bicycle paths: on the south side of Carmel Valley Road between McGonigle Road and Sorrento Valley Road; the San Dieguito River Valley bicycle path; and the Coastal Bicycle path along the railroad right-of-way from San Diego to Oceanside. [8]

A concept sketch is provided within the Transportation Element for a joint use pathway to be shared by bicyclists and pedestrians, physically separated from Carmel Valley Road. The pathway "should be constructed with a combination of concrete and wood ..... the path should meander along the lagoon".

Since the 1996 adoption of the Torrey Pines Community Plan, the City of San Diego embarked on a feasibility study for a separated pathway along Carmel Valley Road. The "Carmel Valley Road Enhancement Project Task Force" met over several months during the summer and fall of 1997. The task force concluded that a separated trail along the south side of Carmel Valley Road would significantly impact the Los Penasquitos Lagoon and the available parking. The City of San Diego is proceeding with plans to widen the road to accommodate bike lanes along Carmel Valley Road.

University City Community Plan (January 16, 1990): The University City Community Plan covers the area immediately south of the Torrey Pines area, incorporating the University of California, San Diego and the University City community, just north of the Marian Bear Memorial Park. The goals of the Transportation Element, Section D, Non-Motorized Transportation states: "Implement a program for the development of bikeways with an emphasis on separated bike paths that are interconnecting." A proposed Class I bikeway is identified along the railroad right-of-way through the Rose Canyon Recreation area.

The Urban Design Element of the University City Community Plan states "that bikeways are important in and around University campuses not only for transportation but also for recreational purposes. An expanded system of bikeways will encourage additional students to bicycle to and from campus."

Mira Mesa Community Plan and Local Coastal Program (March 1981): The Transportation Element "proposes a system of bikeways that provides both good inter-community service and access to the City-wide system."[9] A Class I bike path is proposed along Miramar Road but has not been constructed. The railroad right-of-way progresses through an area identified in the Mira Mesa Community Plan as Sub-area "D" (Carroll/Soledad Canyon Interface). The canyon forms an extremely scenic subsystem that has value for recreation and conservation of natural resources.

[8] City of San Diego, Torrey Pines Community Plan, pp 47.

[9] City of San Diego, Mira Mesa Community Plan and Local Coastal Program, pp 59.

Realignment of NAS Miramar EIR (February 1996) was prepared in accordance with the Defense Base Closure and Realignment Act (BRAC) of 1990. As a result of the BRAC 93 decision NAS Miramar was closed and assets (aircraft, equipment, and personnel) currently stationed at MCAS Tustin and MCAS El Toro were relocated to MCAS Miramar. Section 3.8 Public Health and Safety identifies the western portion of the base, which includes the railway right-of-way as being located within the established Accident Potential Zone (APZ). The purpose of establishing APZ's is to delineate recommended surrounding land use for the protection of persons and property on the ground.

Section 4.11 Noise identifies areas of Flight Corridor Activity and the associated impacts of increased noise levels. These noise levels are intermittent and varied. MCAS Miramar does not have plans to expand facilities to the area adjacent to the right-of-way.

Each community plan was reviewed to determine its consistency with Coastal Rail Trail project. The City's General Plan and the related community plans note the need to pursue bikeway facilities, to ensure connections to other bicycle facilities, and to provide safe alternative transportation modes. The estimated usage of the trail through MCAS Miramar will not exceed the threshold established by the APZ.

County of San Diego

The trail corridor does not lie within the jurisdiction of the County of San Diego. However, it does provide connections to existing and planned trails within the County areas. These include the San Luis Rey River Path, which extends into the community of Fallbrook, the San Dieguito River Park trails which traverse easterly to Vulcan Mountain in Julian, the Los Penasquitos trail, which connects the inland community of Poway to the coast, and the east-west rail trail from Oceanside to Escondido, which will traverse through portions of the county and is currently in the design phase.

San Dieguito River Park Concept Plan (September 15, 1993) states that "an ambitious but achievable goal of the Concept Plan is to create a trail system that will extend from the ocean at Del Mar to the desert just east of Vulcan Mountain." Once constructed this multi-use Class I trail will provide a regional multi-use trail connection extending over 55 miles as far as Vulcan Mountain in Julian to the Coastal Rail Trail at the Del Mar Fairgrounds.

Ongoing coordination with the San Dieguito Riverpark, the City of San Marcos (lead agency for the Oceanside- Escondido rail trail), the City of Oceanside for the San Luis Rey River Path, and the City of San Diego for the connection to the Los Penasquitos Trail, will continue to ensure connection to these regional east-west trails

2.3 Summary of NCTD/MTDB Service Plans

Current passenger service between Oceanside and San Diego is provided by both AMTRAK (8 trains per direction per day) and Coast Express Service ('Coaster') provided by the SDNCTDB (9 trains per direction per day). There is an average of 34 total passenger train movements per day along the corridor and approximately six freight trains, or roughly two trains per hour on average. The Coaster train operates at speeds up to 90 mph. Existing transit stations are located at the Oceanside Transit Center, Carlsbad Village Station, Poinsettia Station, Encinitas Station, Solana Beach Station, Sorrento Valley Station, Old Town Transit Center, and Santa Fe Depot.

The NCTD Board recognized the importance of bike paths along the Oceanside to San Diego rail corridor and approved the Memorandum of Understanding on November 20, 1997. A rail trail is identified along the existing railroad right-of-way from Oceanside to Escondido in the Environmental Assessment and Environmental Impact Report for the proposed passenger rail line along this corridor. The proposed rail trail along the Oceanside to Escondido rail line will provide an east-west connection for bicyclists and pedestrians to the Coastal Rail Trail in Oceanside.

On April 30, 1998, the NCTD Board approved the preparation of a "North County District Business Plan and Capital Needs Study". A component of that study, "Long Range Rail Master Plan and Capital Element" will explore future rail improvements along this corridor. Figure 2.1 shows a summary of current planned projects. The results of this two-year study will determine the timing of these and possibly other rail projects.

The Metropolitan Transit Development Board (MTDB) is currently conducting preliminary engineering for the light rail system which is described in the Mid-Coast Corridor Alternative Analysis/Draft Environmental Impact Statement/Draft Environmental Impact Report. This report summarizes the impacts and costs of the light rail project and other highway improvement alternatives along this corridor.

The Light Rail Transit (LRT) Alternative would include construction of two LRT tracks located east of and immediately adjacent to the existing SDNR railway. Both LRT tracks would cross over Balboa Avenue on a new bridge and additional LRT stations would be constructed at Balboa Avenue and Morena Boulevard, Clairemont Drive and Morena Boulevard, and Tecolote Road and West Morena Boulevard. The certified EIR, adopted by MTDB Board in October 1995, includes analysis of the LRT extension to Balboa Avenue and Coaster Station projects. Coordination with MTDB during the design phase of the Coastal Rail Trail will need to occur to ensure that right-of-way access is maintained for the second track for the Light Rail Transit.

NCTD is exploring options to straighten the section of the railroad from I-805 to Miramar Road due to the extreme grade, which requires trains to reduce speeds to adjust for the grade and curves. The Miramar Hills Curve Realignment and Second Track, Alternatives Analysis Report, released in August 1997, recommends alternative alignments for both the rail and trail.

2.4 Connections to Other Trails

The Coastal Rail Trail will parallel the existing Class II bicycle lanes along Highway 101 (Coast Highway) except for the Agua Hedionda Lagoon where the trail will divert from the railway right-of-way and utilize the Highway 101/Coast Highway bicycle lanes. The rail trail will provide an opportunity to walk/bike along the Coastal Rail Trail and access the bicycle lanes or sidewalks at numerous locations along the coast. This 44-mile corridor will provide an excellent connection to other regional east-west routes, Class I bicycle paths, Class II bicycle lanes, and other natural walking paths such as at the Marian Bear Natural Park Recreation area and the Rose Canyon Open Space Park.

These connecting routes for Class I facilities (existing and proposed) and natural pathways are identified on Figure 2.2 and the connecting Class II facilities are identified on Figure 2.3. Key connections to Class I bicycle paths include the San Luis Rey River Bicycle Path (in-design), Oceanside-Escondido rail trail (in-design), Mission Bay Park bicycle/pedestrian paths (existing), Fiesta Island (existing), and the Bayshore Bikeway (in-design). The Coast to Crest Trail system through the San Dieguito River Park will connect from the beach in Del Mar, crossing the railroad tracks south of the San Dieguito River, to the Vulcan Mountains in Julian.

1. **Double Tracking**
   Carlsbad Village Drive to
   Cannon Drive (Carlsbad)

2. **Double Tracking**
   E Street to
   Birmingham Street (Encinitas)

3. **Grade Separation**
   San Elijo Lagoon to
   Via de la Valle (Solana Beach)

4. **Transit Platform**
   Del Mar Racetracks (Del Mar)

5. **Sorrento Valley Station**
   Parking Lot

6. **Double Tracking & Curve Realignment**
   Miramar Hill (City of San Diego)

7. **Nobel Drive Trolley Station**
   Nobel Drive (City of San Diego)

8. **Elvira Curve Straightening**
   Across from Mission Bay Drive (City of San Diego)

9. **False Bay Siding (Double Tracking)**
   Balboa Avenue to
   Mission Bay Drive (City of San Diego)

10. **Mid-Coast Trolley Project (Light Rail Extension)**
    San Diego River to North University City
    (City of San Diego)

Source: NCTD, MTDB

FIGURE 2.1	SUMMARY OF NCTD / MTDB CURRENT AND PLANNED PROJECTS	COASTAL RAIL TRAIL

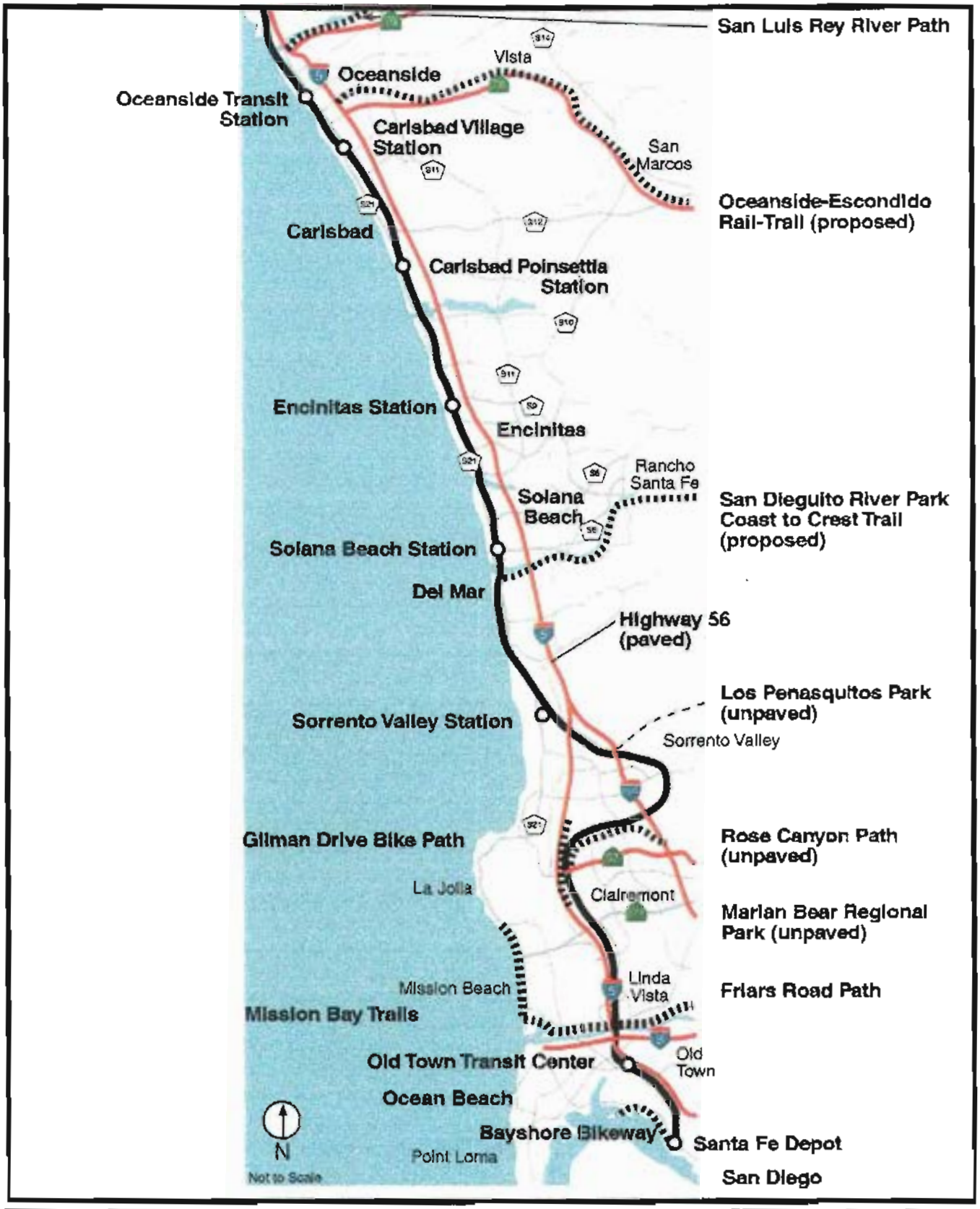

FIGURE 2.2	CONNECTING CLASS I (SEPARATED) PATHWAYS	COASTAL RAIL TRAIL

FIGURE 2.3	CONNECTING ROUTES FOR CLASS II BIKE LANES	COASTAL RAIL TRAIL

3.0 Need and Purpose

The California Outdoor Recreation Plan of 1993 identifies walking as having the highest participation rate (88%) for outside recreation and bicycling on paved surfaces is listed with a participation rate of 45.8%.[10] The need for the Coastal Rail Trail is demonstrated by the number and variety of people who already use the corridor and potential users based on the success of multi-use trails already constructed in San Diego County, other areas of California, and across the nation. Each user group has specific needs, which will directly affect the planning and design of the Coastal Rail Trail. For example, most pedestrians prefer to walk on a soft-surface, meandering, shaded trail, most bicyclists prefer to ride on a firm surface with few curves, while roller skaters require hard asphalt or concrete surface.

The "San Diego County Bicycle Use and Attitude Survey" completed in May 1994 concluded that over 41% of those surveyed did not cycle "because of a lack of desired bike facilities. ...The bikeway most preferred by cyclist respondents was a separate path that excludes cars (65%)".[11] Existing pedestrian and bicycling activity in the corridor ranges from intense to low depending on the location, season and day of the week. Current uses can be categorized into the following groups:

Commuters

Commuters are generally defined as employed adults, adult students, and school children. Adult commuters are typically seasoned bicyclists and walkers, who can move at or above average speeds and maneuver across busy arterial roads. Often these commuters prefer to ride on the street rather than on a bike path.

School children move more slowly and are less adept at crossing busy streets, and any new street and rail grade crossings must be designed with this user in mind. Access points from the trail to schools, neighborhoods, employment centers, and multi-modal stations must also be provided for the trail to serve as an effective commuter corridor.

Other commuters consist of persons who commute to services. These commuters may choose to walk or bike to the store or other service facility.

Beach Users

Whether they are bound for the beach to walk, sunbathe, or surf, beach users share many of the same characteristics. Local beach users typically arrive by vehicle and park in lots or utilize on street parking as close as possible to reduce the distance they will have to carry various beach articles. They often use an intricate network of informal trails to reach nearby beaches, most of which cross the railroad tracks.

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[10] State of California, Department of Parks and Recreation, "California Outdoor Recreation Plan 1993", April 1994. pp. 32.

[11] Research Network Ltd., "San Diego County Bicycle Use and Attitude Survey," Laguna Hills, Ca., May 1994. pp 10.

The Coastal Rail Trail is expected to carry a high number of beach users who will be seeking access to the beach at numerous locations along the corridor. Beach goers will likely park along the trail and walk to their preferred beach access point. In this manner, the Coastal Rail Trail will enhance access to the beaches by allowing people to park farther away, or hopefully bicycle or walk rather than drive.

Recreation

The Coastal Rail Trail will attract a significant number of users who simply desire to use the corridor for exercise and recreation. This includes families with young children, members of clubs, long distance bicyclists, people walking their dogs, roller skaters/bladers, and joggers.

Benches, drinking fountains, signage, bicycle racks, and waste receptacles are just a few of the items typically required for recreational and commuter trail users alike. Because of this multiplicity of needs, the Coastal Rail Trail is designed to separate different user groups, as much as possible, on a wider paved surface. Separated paved or unpaved facilities may be considered after the initial implementation in areas where the trail experiences heavy usage.

3.1 Destinations

The Coastal Rail Trail will directly or indirectly serve virtually all of the regional and local destinations along the corridor. Destinations may be a local city park or a regional destination such as the Del Mar Racetrack or Carlsbad State Beach. Identifying these destinations will assist in locating required access points and connecting facilities as part of the planning and preliminary design process. A list of recreational and commuter destination points is provided as a part of the description of each of the alignment segments found in Chapter 5.0.

3.2 Roadway Conflicts and Traffic Volumes

Bicyclists, pedestrians, and others currently traveling along the corridor have the choice of using roadways such as the Coast Highway, Camino Del Mar, and Torrey Pines Road. While bike lanes and/or wider curb lanes are provided along some of the route, the roadways present a combination of high traffic volumes, higher speeds, and side friction from driveways, parked vehicles, and intersecting roadways. Most roadways are adequate and may be the facility of preference by experienced bicyclists; however, less experienced bicyclists, such as children, the elderly, and families, are likely to be intimidated by these conditions. Wheelchair users will prefer a Class I facility because it will limit the number of times they must cross streets, they will encounter fewer obstructions, and more even surfaces.

Pedestrian facilities such as sidewalks or trails provide areas for walkers, joggers, and other users who feel uncomfortable using the existing coastal north-south roads. In some areas, such as the community of Leucadia in the City of Encinitas, pedestrians typically walk on shoulders on Vulcan and cross Highway 101 at unprotected crossings.

The typical Average Daily Traffic (ADT) volumes on the major north-south routes parallel to the Coastal Rail Trail are between 10,000 and 20,000 vehicles. As population and job opportunities continue to expand along the corridor, so will traffic volumes. As shown in Figures 3. 1 and 3.2, traffic volumes on north-south and east-west roadways adjacent to the corridor are projected to increase. The only exceptions are Santa Fe Drive and Genesee Avenue at the northern-most portion of State Route 805.

3.3 Accident Summary

Accident data of bicycle/walker and vehicle conflicts are relevant to the Coastal Rail Trail, as higher than average accident rates for some cities may make the Coastal Rail Trail a useful solution for separating vehicles and walkers/bicycles. Local jurisdictions and the California Highway Patrol record information on accidents. Data from most accident reports is filed into the Statewide Record Keeping System (SWTRS). Bicycle and pedestrian accidents are typically only recorded when they involve serious injury or death, or motor vehicles. As such, bicycle and pedestrian accident records are usually under-reported.

A review of bicycle related accidents in the City of Encinitas between 1992 and 1995 showed a high number of accidents along the routes parallel to the Coastal Rail Trail (Vulcan Avenue, San Elijo Avenue, North Coast Highway 101, and South Coast Highway 101), accounting for 25% of all reported bicycle-related accidents in the City. The single worst accident location for bicyclists within the City of Encinitas is between "Restaurant Row" and the southern city limits along the Highway 101.[12] Construction of the Coastal Rail Trail would remove many bicyclists that may be uncomfortable or inexperienced with cycling on the road, thereby avoiding numerous conflicts at many of the intersections in this corridor.

Statistics reflecting pedestrian and bicycle accidents on the railroad tracks are recorded by NCTD. There were 11 recorded fatalities on the tracks in 1992, 13 in 1993, 8 in 1994, and 5 in 1995. Of the 37 recorded fatalities, 13 (35%) were ruled suicides and the remainder accidents. The number of fatal accidents on the tracks has declined every year since 1992, except, in 1996 there were twelve fatalities reported. Contrasting with the NCTD statistics are reports from the Federal Railway Administration that the 1996 statistics reveal deaths among trespassers were down 4.4% and injuries among trespassers were up 1.3%, nationwide.

[12] Barton-Ashman Associates, Inc., "Master Bikeway Plan and Engineering Feasibility Study for the City of Encinitas," 1990, pp39

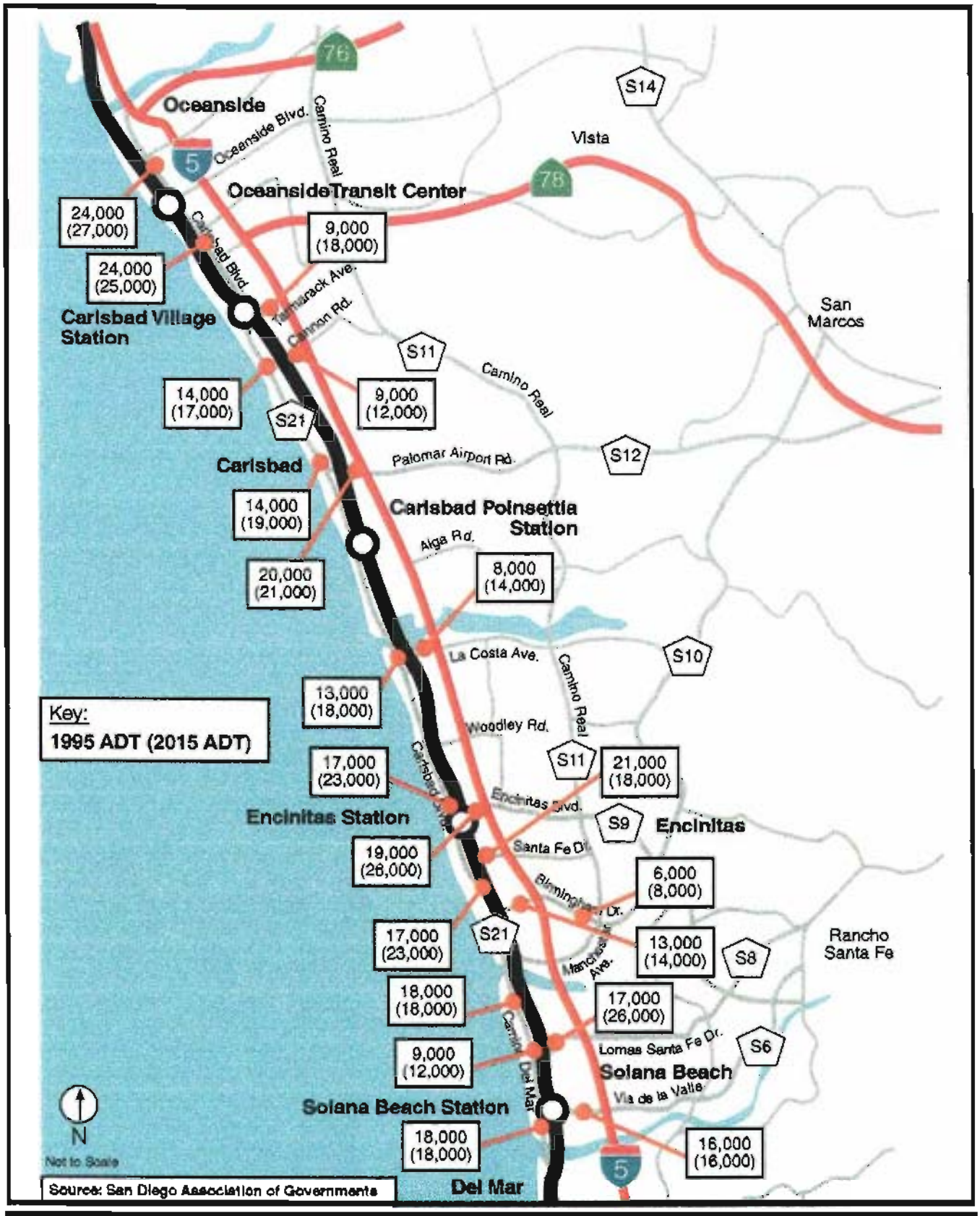

FIGURE 3.1	1995 AND 2015 AVERAGE WEEKDAY TRAFFIC VOLUMES OCEANSIDE TO SOLANA BEACH	COASTAL RAIL TRAIL

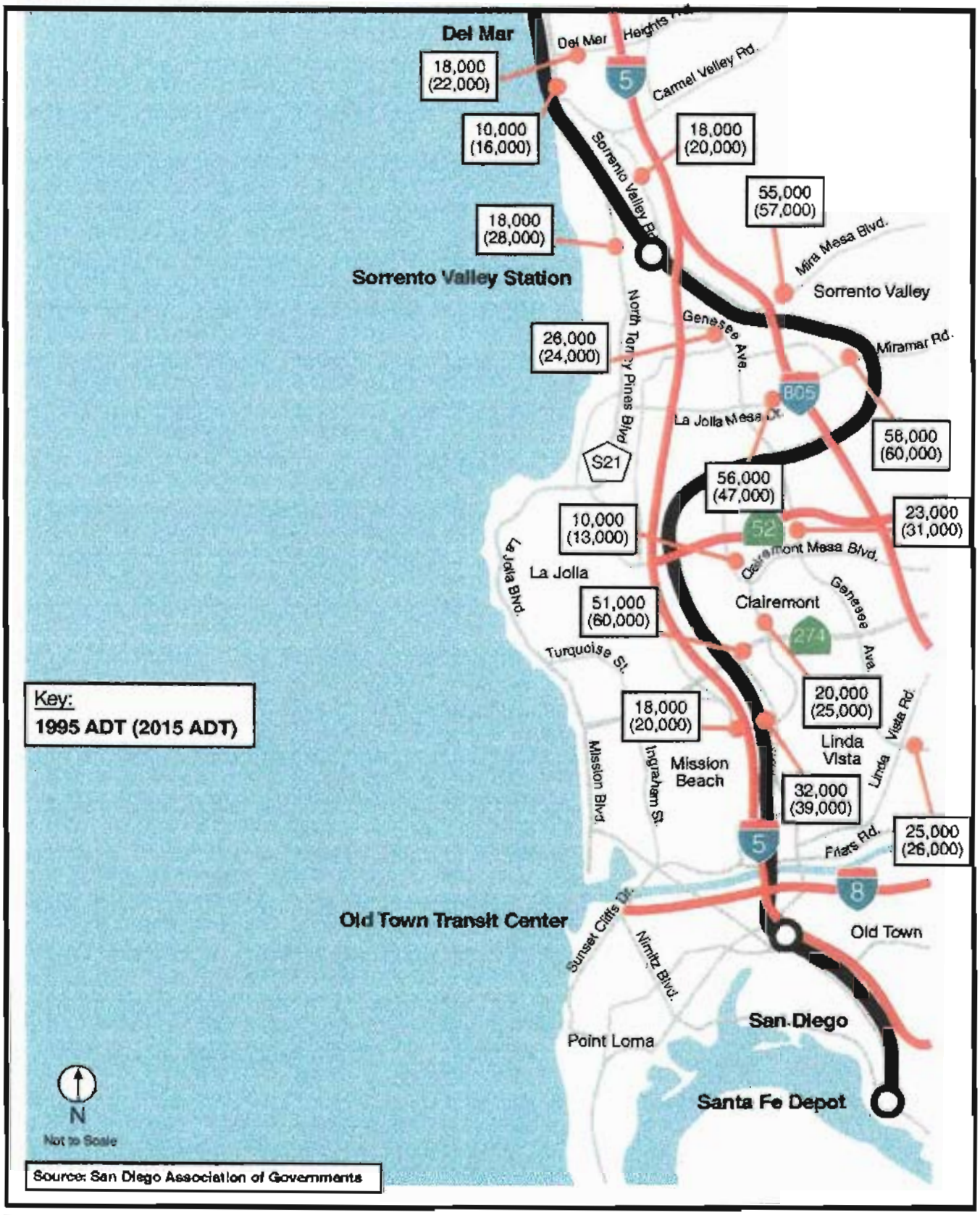

FIGURE 3.2	1995 AND 2015 AVERAGE WEEKDAY TRAFFIC VOLUMES DEL MAR TO SAN DIEGO	COASTAL RAIL TRAIL

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3.4 Future Land Use and Demographic Changes

San Diego County's 1995 estimated population of 2,669,300 is expected to increase by 44% to 3,853,900 by 2020, as shown in Table 1 (INFO SANDAG/Sourcepoint, September-October 1999, No. 5 pg. 8). The North County West Metropolitan Statistical Area (MSA), including the corridor cities of Carlsbad, Del Mar, Encinitas, Oceanside, and Solana Beach, make up 10.8% of the County's population. The City of San Diego, the largest city in the County, makes up 44% of the population. These six cities, which will enjoy direct access to the proposed Coastal Rail Trail, share significant features as summarized below:

- Since 1990, the cities have had an average gain of 17.2% as of January 1, 2000 with Carlsbad gaining 30.5% and Oceanside 25.2%.of the share.

- The cities expect an average employment gain of 27.5% by 2010, with Carlsbad and Oceanside gaining 47.1% and 51.5%, respectively; and

- Five of the six cities meet the 1% national average of commuters who bike to work.

Given the scenic beauty of the corridor, warm climate, and projected growth in both population and employment, the existing average mode split of 3.4% for walking and 0.8% for bicycling for the six cities has the potential to be much higher.

Table 1
Population and Employment Growth Forecasts

Jurisdiction	Population Growth Forecast			Employment Growth Forecast		
	1995	2020	% Change	1995	2020	% Change
Carlsbad	67,200	132,200	97%	41,200	86,200	45.0%
Del Mar	5,100	6,100	20%	3,200	5,600	13.0%
Encinitas	56,800	70,800	25%	22,600	27,800	23.0%
Oceanside	145,900	202,600	39%	34,600	67,100	94.0%
San Diego	1,174,400	1,693,500	44%	606,600	836,900	38.0%
Solana Beach	13,500	16,100	19%	8,700	9,700	11.0%
San Diego County	2,669,300	3,853,300	44%	1,089,900	1,627,900	50%

Sandag Info Sept-Oct. 1999

3.5 Projected Short and Long Term Coastal Rail Trail Usage[13]

The proposed Coastal Rail Trail will be designed for multiple-use commuting and recreation. The major uses that are anticipated include bicycling, walking, running, and roller skating/blading. The potential recreational uses are put into perspective by a 1996 national survey for the "President's

[13] Information in this chapter partially derived from Sacramento River Greenway Master Plan, 1991.

Commission on Americans Outdoors", showing the percentage of adults who participate in the following selected activities one or more times during a year:

Walking for pleasure	84%
Bicycling	46%
Running or jogging	42%
Day hiking	27%

Other uses will undoubtedly occur with new trends and activities. Along with the types of uses, the demand or total numbers of recreational users can be expected to increase. The number of recreational activities in San Diego County has increased steadily with the growth in population and increased interest in bicycling, walking, and jogging. This trend is expected to continue.

The nature of the Coastal Rail Trail will be somewhat different than multi-use trails elsewhere. Use of the trail near the beaches, such as in the City of Encinitas, is expected to be heavy with people using the Coastal Rail Trail to reach the shoreline. It is expected that many residents, who currently drive to the beach, will now choose to ride or walk using the Coastal Rail Trail. In other areas, local residents and longer distance walkers and cyclists will use the trail. Commuting activity is expected to be high near rail stations, schools, universities, and major employers and commercial centers.

The Coastal Rail Trail has the advantage of incorporating routes and usage patterns that already exist since the corridor is already extremely popular, especially in the summer months, and is estimated to generate a substantial number of destination trips. People from San Diego County and the immediate vicinity dominate current use in general, although it is likely that, once completed, the Coastal Rail Trail will attract visitors from outside the region. For example, residents of Orange and Los Angeles Counties could use MetroLink to Oceanside to access the trail for day trips.

In order to estimate the number of future recreational trail users, several assumptions must be made about potential users and the Coastal Rail Trail itself. These include the following:

- Peak season assumed to be 210 days long.
- Off-season usage assumed to be 25% of peak season (155 days).
- Overall weekday use is assumed to be 25% of weekend or holiday use.
- A ratio of pedestrians to bicyclists is assumed to be 3:2.
- A range of age use for the trail system is assumed.

Assumed age groups utilizing the Coastal Rail Trail are as follows:

Under 15 years	20%
16 - 25	15%
26 - 35	20%
36 - 45	22%
46 - 55	12%
56 and over	11%

Assumptions on the characteristics of trail users include the following:

- 70% of the trail demand will be derived from the local community.
- 90% of the trail users will arrive on foot, by bicycle, bus, or train.
- 10% of the trail users will drive specifically to use the Coastal Rail Trail.
- Average round trip walking distance is assumed to be 1 mile.
- Average round trip bicycling distance is assumed to be 5 miles.
- The number of average annual trips per capita in North County is assumed to be seven (7).
- The number of average annual trips per capita in San Diego County is assumed to be one (1).

Based on these assumptions and an estimated 1995 population base of 1.4 million persons for the six participating cities, the trail recreational usage projections are shown below in Table 2.

Table 2
Trail Recreational Usage Projections

Type of Activity	Participation Percentage	Annual Average Number of Trail Users[14]	Peak Day Number of Users	Annual Number of reduced vehicle trips[15]
Walking for pleasure	84%	2,990,000	12,000	240,000
Bicycling	46%	1,640,000	6,600	132,500
Running or jogging	42%	1,490,000	6,000	120,000
Day hiking	27%	960,000	3,900	77,500
Total		7,080,000	28,500	570,000

Projections of usage by commuters are derived from the 1990 U.S. Census 'Journey to Work' data, which covers employed adults ages 16 years and older (see Table 3). Added to these commuters are an estimated 50,000 school age children and college/university students living within 2 miles of the Coastal Rail Trail who may be able to walk or ride to school rather than drive. The current percentage of employed adults who walk to work is approximately 3-4%, while bicyclists comprise about 1% of commuters. With completion of the Coastal Rail Trail and connections to the transit stations and employment centers, these percentages are expected to double.[16] This translates into an estimated 15,000 employed adult commuters who will walk or ride to work on a typical weekday. Add to this figure an estimated 15% of students who will walk or ride, and the total daily number of commuters walking or bicycling in the Coastal Rail Trail corridor is projected to be 22,500.

[14] On total trail system. Counts at individual locations will be significantly lower. Does not include people crossing the Coastal Rail Trail.

[15] Assumes that 10% of trail users drive to trail, while 30% of users walk or ride rather than drive. Assumes only 1/3 of walkers to be current users rather than new users, which would not affect reduced vehicular trips. Net reduction equals 20%. Assumes average vehicle occupancy of 2.5 persons per vehicle for recreational trips.

[16] U.S. Department of Transportation, "National Walking and Bicycling Study," 1995.

Table 3 Journey to Work Mode Split							
Jurisdiction	**Total Travel to Work**[17]	**Mode**					
		Rail	%	Walk	%	Bicycle	%
Carlsbad	33,132	75	2%	526	1.5%	272	.8%
Del Mar	3,041	0	0%	148	4.9%	24	.8%
Encinitas	31,259	11	.03%	718	2.3%	317	1%
Oceanside	58,058	50	.08%	1127	1.9%	254	.4%
San Diego	560,913	115	.02%	27,250	4.9%	6,111	1%
Solana Beach	7,266	6	.08%	357	4.9%	80	1.1%
San Diego County	1,230,466	373	.03%	55,749	4.5%	10,785	.8%

Source: 1990 U.S. Census

3.6 Economic Impact

California has one of the world's largest tourism economies, contributing over $52.7 billion annually and over 750,000 jobs. Tourism is one of the major industries in San Diego County. The 1993 California Outdoor Recreation Plan states that trends, which affect tourism, also affect recreation, with shorter and more frequent escapes replacing the standard two week vacation. Recreational activities can generate a substantial net benefit to the community. This results in spending for food, lodging, fuel, and clothing. Research has shown that residents of the area will also spend money associated with the recreational activities they pursue.

Multi-use trails have been shown to have a positive economic impact on the communities they serve. The economic benefits can be both direct and indirect. The direct economic benefits derive from people coming into the community to use the Coastal Rail Trail and the spending that occurs during their visit. An indirect economic benefit, which will result from the Coastal Rail Trail, involves an increase in the quality of life in the community, improving property values near the facility, increasing tourism and improving air quality. Greater quality of life results in the community being a more desirable relocation destination for families and companies.

Using the assumption that 70% of recreational users will come from the local community, projections of new spending associated with the Coastal Rail Trail can be made. Trail users spend

[17] Workers 16 years and older.

an average of about $14/per capita, meaning that the 2.1 million non-local recreational trail users will bring an estimated $29 million into the coastal communities annually.

While there is often initial reluctance on the part of trail neighbors to having a public thoroughfare established near their residence, research has shown that a well-designed and managed trail system quickly becomes a community asset and in fact can increase property values of homes near the trail. A survey of homeowners found that between 23% and 30% felt that an adjacent trail significantly or slightly increased the value of their homes.[18] Other evidence of this economic benefit can be found in the newspaper listings for homes for sale, which cite proximity to the trail as a selling feature not unlike proximity to a park or community center. Trails coexist, and in fact thrive, even in affluent areas such as San Juan Capistrano, Rancho Santa Fe, Mission Beach, and Lafayette, California where home values can exceed $1 million. Many of these private residences have established gates to access the adjacent trail when the trail is not openly accessible.

3.7 Multi-Use Trail Conflicts

In designing a trail, it is important to retain the freedom of choice for multi-use trail users. The rail trail is designed to allow twelve foot wide two-way traffic on a hard surface with two foot wide dirt shoulders for drainage and walking/jogging. It is anticipated, that in areas where there is adequate room, separated natural (dirt) trails for pedestrians may be constructed. Conflicts can occur for numerous reasons and "have been found to be related to activity style (mode of travel, level of technology, environmental dominance, etc.), focus of trip, expectations, attitudes toward and perceptions of the environment, level of tolerance for others, and different norms held by different users."[19]

Conflicts, which may occur on multi-use trails, may be avoided or resolved by the use of some techniques utilized by other trail managers. The following is a list of possible techniques received from trail managers in response to a Rails to Trails Conservancy survey "Sharing Corridors for Transportation and Recreation" (these are listed from the most to least frequently reported):

- signage,
- education,
- meetings with user groups,
- expanding facilities,
- enforcement of regulations,
- brochures, articles in newsletters or local newspapers,
- imposing speed limits,
- volunteer trail patrols,
- partial closing of the trail,

[18] "The Impact of the Brush Creek Trail on Property Values and Crime", Sonoma State University, 1992.

[19] Conflicts on Multiple-Use Trails: Synthesis of the Literature and State of Practice, Federal Highway Administration, 1994 pp 1, 16.

- bicycle bell give-away. (*The East Bay Regional Park District in California requires bicyclists to have bells on their bikes in order to warn other users when they pass.)

Some multi-use trail managers have reported user conflicts when there is extensive use and there is not adequate room for all users to enjoy the pathway during those peak periods. The City of San Diego is currently considering widening the existing 10' wide concrete multi-use trail at Mission Beach Boardwalk for this reason. The proposed plan calls for a separation of the "wheeled" users (bicyclists, roller bladers, and skate boarders) from walkers/joggers. Studies reveal that the Mission Beach Boardwalk peak usage is over 3,000 users in a 15 minute period. Uses vary based on weather and activities along this 2-mile path. In an attempt to curtail high-speed cyclists and avoid potential conflicts, the City of San Diego enacted a speed limit of 8 mph for bicyclists and other wheeled users using the Mission Beach Boardwalk. Future monitoring of this program will determine its effectiveness and cost to implement.

There is no one best solution to avoid or resolve user conflicts on a multi-use trail. However, thoughtful design, ongoing education, and a trail management program that is resolution-directed, user conflicts will be reduced.

3.8 Air Pollution Reduction

The federal Clean Air Act (CAA) forms the basis for the effort to reduce air pollutants. National Ambient Air Quality Standards (NAAQS) is a basic element of the CCA, which provides a threshold for pollutants. Areas with levels that exceed the threshold for specified pollutants are designated as "non-attainment areas".

Each state is mandated to submit a State Implementation Plan (SIP) which specifies the measures taken by each state to reduce pollutants. The San Diego County Air Pollution Control District (APCD) prepares the San Diego region's SIP. The adopted SIP includes four air quality strategies: ridesharing, transit improvements, traffic flow improvements, and bicycle facilities and bicycle programs.

"On-road vehicle emissions account for approximately 60% of smog in the San Diego region."[20] Walking and bicycling do not consume petroleum products and are non-polluting modes of transportation. Walking and bicycling generally replace short distance commuting trips, which are the most polluting of vehicle trips. The 1990 amendments to the CCA recognize the use of bicycling and walking as transportation and one that can effectively reduce carbon monoxide emissions from mobile sources (cars, trucks, buses, etc).

There have been some studies completed to address the potential benefits to air quality. The Federal Highway Administration (FHWA) has conducted numerous studies on the benefits of cycling. In the United States in 1991, it was estimated "that bicycling and walking were equivalent to 7.6 and 28.1 billion motor vehicle miles, saving 370 to 1,340 million gallons of gasoline and 4.4

[20] SANDAG, "1998 Regional Transportation Plan".

to 16.3 million metric tons of exhaust emission air pollution."[21] Additional estimates of the air pollution cost savings resulting from increased walking or bicycling rather than driving a car, are estimated at $0.40 per 2.5-mile urban commute trip and $0.24 for all other urban trips.[22]

Quantifying these benefits by monitoring changes in air quality is difficult because inadequate data exists and it is difficult to recognize the benefit of just one program when there are many other reasons or programs which may contribute to a reduction in air pollution. Additionally, it is difficult to project what the usage will be of a facility that has yet to be built. The Air Pollution Control District encourages the use of integrated planning for land use, transportation, and air quality, which supports all modes of transportation. The California Air Resources Board (CARB) estimates that a fully integrated plan can achieve trip reductions of 10 to 23 percent with commensurate air quality benefits. Incorporating non-motorized transportation and mass transit programs can effectively result in increased air quality.

[21] Federal Highway Administration, "The National Bicycling and Walking Study," pp 18.

[22] Georgia Institute of Technology Center for Planning and Development, Nelson, Arthur C. "Private Provision of Public Pedestrian and Bicycle Access Ways: Public Policy Rationale and the Nature of Public and Private Benefits", 1995, pp13

4.0 Implementation

Upon adoption of the Project Study Report and approval of the environmental document, several key issues will need to be resolved prior to actual implementation. These key issues are listed below and are discussed in detail within this chapter.

- How will design and construction of the project be funded?
- What agreements need to be negotiated to permit public access within the railroad right-of-way?
- Who will manage the trail?
- How will the project be operated and maintained?

4.1 Funding

Funding to plan the trail, conduct environmental review, complete the permits, design, and construct the Coastal Rail Trail has come from a variety of local, state, and federal funding sources. To date, the following grant funds have been awarded:

Congestion Management and Air Quality (Federal)	$ 5,824,000
TransNet (State)	1,461,500
Transportation Enhancement Activities (Federal-TEA21)	4,513,500*
Transportation Enhancement (Federal)	600,000
Air Pollution Control District (State)	184,000
Total	$12,583,000

*Includes both 1996/97 & 1998/99 funding

Additional funding will need to be obtained, either independently or jointly with two or more agencies, in order to fund the balance of the design and construction. The potential for funding the project through grant funds is very favorable. Bicycle advocacy has increased considerably since the implementation of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA). This act made the most comprehensive revision of federal surface transportation funding in 35 years. The legislation shifted many transportation decisions previously made by the federal government to the states and Metropolitan Planning Organizations (MPO's). Some funds previously reserved for motorized transportation were allocated for bicycle and pedestrian facilities programs. TEA-21, the reauthorization of ISTEA, approved in spring of 1998 allocated additional funds for pedestrian and bicycle enhancement projects, including education, over the next six years.

Within the ISTEA umbrella, a program called Congestion Management and Air Quality (CMAQ) encourages transit-related, alternate mode projects. CMAQ funds are intended for use in non-attainment air quality areas for the purpose of improving air quality by reducing traffic congestion, road maintenance, petroleum consumption and demand for additional roads. Approved CMAQ funded projects include new or improved bicycle lanes, or paths; traffic control devices to facilitate bicycle travel; parking facilities for bicycles; bicycle route maps; and programs for bicycle safety, education, and promotion.

Other bicycle-related funding programs are summarized below. A comprehensive list of all local, state and federal funding programs that can be used to develop trails and bikeways, are listed in Table 36, located in Appendix H.

The Surface Transportation Program (STP): "the other ISTEA program" operates as a block grant program and may be used by states and local governments for a variety of roadway and alternative travel mode projects. Under ISTEA, 10% of the states' STP funds are earmarked for Transportation Enhancement Activities (TEA). Projects funded through TEA must have a direct relationship to the multi-modal transportation system and provide features, which enhance traditional transportation projects. Local agencies must fund an 11.5% match for bicycle, pedestrian, and right-of-way projects.

During 1993/94, the California Transportation Commission allocated $3.8 million in TEA funds for bikeway and bicycle/pedestrian projects in the San Diego region. Funding earmarked for regional bikeway projects will create both north-south and connecting east-west trails throughout the county.

The Environmental Enhancement and Mitigation Program: a state funding program for projects that offset environmental impacts of modified or new public transportation facilities. These include streets, mass transit guideways, park and ride facilities, and transit stations.

The Air Pollution Control District (APCD) levies fees of up to $4 per vehicle through motor vehicle registration fees to fund projects which contribute toward meeting California Clean Air Act goals. Projects funded have included bicycle safety enforcement, commuter education, and other programs that have a high potential to improve air quality.

Transportation Development Act Article III (SB 821): state block grants awarded annually to local jurisdictions for bicycle and pedestrian projects in California. These funds originate from state sales tax and are distributed through the Regional Transportation Planning Agency (RTPA) to local jurisdictions based on criteria adopted by the RTPA.

AB 434: funds are available to clean air transportation projects, including bicycle projects, in California.

The State Bicycle Transportation Account (BTA): coordinates an annual program that is available for funding bicycle projects. Available as grants to local jurisdictions, the emphasis is on projects, which encourage bicycling for commuting purposes. Recent changes in this program increased the funding from $360,000 available statewide annually to over $12 million over a 5 year period.

The Railroad-Highway Crossing Program: provides funds for site improvements and installation of safety and protection systems, such as warning devices, illumination and signals on existing railroad-highway grade crossings. To qualify for this federal program, a project must be on a public road, sponsored by a County or City, be included on the CPUC "Recommended List of Public Crossings in California for Improved Crossing Protection with Federal Funding", and be included in the appropriate Transportation Improvement Program (TIP) developed by a

Metropolitan Planning Organization (MPO). A ten percent local matching fund is required. (The CPUC and CalTrans both administer the at-grade and grade separated funding programs. Both programs are potential sources of Coastal Rail Trail funding, if bicycle and pedestrian facilities are included as part of the crossing improvement.)

Grade Separation Program: provides funds for railroad grade separation projects by establishing a priority list of those most urgently in need of separation, including the elimination of existing or proposed grade crossings, the elimination of grade crossings by removal or relocation of streets or railroad tracks, and existing grade separations most urgently in need of reconstruction. The list, based on criteria established by the PUC, includes projects on city streets, county roads, and state highways, which are not freeways.

Funding applications may require completion and adoption of a bicycle master plan, estimates of the costs and benefits of the system (including saved vehicle trips and reduced air pollution), proof of public involvement and support, CEQA compliance, access to right-of-way, and commitment of local resources. NCTD issued a policy in 1998, which stated that they would remain fiscally neutral to any activity associated with the Coastal Rail Trail.

4.2 Agreements

NCTD (within Oceanside, Carlsbad, Encinitas, Solana Beach, and Del Mar) and MTDB (within the City of San Diego) own the railroad right-of-way. Currently, the right-of-way does not permit public access, except for the segments in Solana Beach and Cardiff where there are agreements with NCTD and Solana Beach to permit public access. At the beginning of this planning process, for the Coastal Rail Trail, it was determined that a Memorandum of Understanding was necessary to ensure that all of the cities and the transit agency were in agreement to cooperatively work together towards developing a trail within the railroad right-of-way.

Memorandum of Understanding

In an effort to ensure continued coordination and cooperation, the Coastal Rail Trail Committee prepared a Memorandum of Understanding (MOU). City Council meetings were held to review the MOU, which establishes a basic framework and agreement for working cooperatively in planning, designing, constructing, and maintaining the Coastal Rail Trail (see Appendix E). The signatory agencies are the cities of Carlsbad, Del Mar, Encinitas, Oceanside, San Diego, Solana Beach, and NCTD and MTDB.

City of Carlsbad as Lead Agency for CEQA Compliance

Each of the four coastal cities, Oceanside, Encinitas, Solana Beach and Del Mar approved resolutions, which authorized the City of Carlsbad to act as lead agency for purposes of CEQA compliance for the Coastal Rail Trail project. The City of San Diego elected to process their own environmental document independently from the five northern coastal cities. City of Carlsbad anticipates release of the environmental document for public review in late 2000.

Public Access Agreements

The rail right-of-way acquired by NCTD or MTDB ranges from 'in fee', easement, and "filing lands" under the general Railroad Right-of-Way Act of 1875. Historic easements granted to the railroad are based on the corridor being used as a railroad facility. Other uses have been approved by the railroad as long as the use does not infringe on railroad operations. Easements within the SDNR right-of-way range from parking structures encroaching into the right-of-way, to gas, sewer, water, and cable lines, to a beautification project in Cardiff.

Upon completion of this PSR and prior to implementation of any of the trail segments, additional agreements for public access will need to be negotiated between each agency and the right-of-way owner (NCTD or MTDB). The easement or license would specifically identify the location of the trail, setbacks, and areas for required construction. At a minimum, a twenty (20) foot easement would be required to accommodate the trail, required setbacks and grading. The easement boundaries would need to be surveyed and field marked for the construction phase and future maintenance. A sample agreement is included in Appendix F (Sample Agreement for Use of Portions of Railroad Right-of-Way).

As a part of the final design for each phase, other possible impacts related to construction and existing utility easements will be determined. Generally, the trail may be adjusted to avoid above ground utility poles, sewer manholes, and structures, such as parking lots. Prior to constructing on top of an easement for cable, gas, water, sewer, etc, the trail manager would require agreements which indemnify the utility company, mandate liability insurance, and require reimbursement for the upgrade or relocation of facilities (i.e. encasing pipes below the trail).

Most of the existing utility easements run parallel along the railroad, those that cross the right-of-way do so at a 90 degree angle. Minimum clearance for facilities below the track is six (6) feet below bottom of rail. Minimum clearance for facilities above the rail lines is twenty-six (26) feet. For horizontal facilities, there is no minimum clearance.

Utility firms may consider placing fiber optic cables within or under the pavement of the Coastal Rail Trail for ease of maintenance and identification. The Old Dominion Railroad Regional Park in Virginia, who acquired an abandoned railroad corridor, has been able to sell yearly licenses for fiber optic cables, which are installed within the paved trail. All of the funds necessary to maintain and operate the trail are received from these annual license fees.

4.3 Trail Management

Project management includes design, construction, maintenance and monitoring. The project will traverse across the boundaries of six cities and each may choose to manage the trail within their jurisdictions. However, there are other options to consider related to the management of the Coastal Rail Trail.

1. Each agency might conduct project management of the rail trail within their jurisdictions through a joint agreement with NCTD or MTDB for use of the corridor.
2. One agency (either a city or the railroad), through a Joint Powers Authority Agreement (JPA), might conduct project management for the entire trail.
3. An independent, non-profit organization might conduct trail management on behalf of one or more of the six agencies.

The advantages of each individual agency constructing and maintaining the trail within their city limits are that each agency is familiar with the needs of their city; will have more flexibility in the design of the project within their jurisdiction; will have control over the maintenance and monitoring of the trail; and may pursue funding for their segment of the trail. The advantages of one agency operating and maintaining the trail for more than one city may include reduced insurance costs, less duplication in manpower and equipment, and greater ability to lobby for grant funds.

Since the trail will be constructed in phases, agreements with NCTD or MTDB will occur during the design phase of each segment. Upon completion of the entire 44 mile trail or upon completion of the trail through several cities, it may be desirable at that time to enter into a JPA for the ongoing trail management.

There are obvious cost and efficiency advantages to having one agency or a Joint Powers Authority Agency control implementation and operation of the trail. The agency would be in a better position to secure capital funding as a regional, multi-jurisdictional project and provide consistent and coordinated design, construction, maintenance and operations. Under this scenario, individual cities and SDNR would participate in the final design of the trail, assuming it met minimum standards prescribed. A joint liability insurance policy that protects all of the participating agencies from the costs of any potential lawsuit and uniform indemnification policies to SDNR may be more affordable.

An additional option for trail management is to have the rail operator (NCTD) maintain the trail. The advantages in having NCTD control the Coastal Rail Trail allows for coordination of operations, maintenance, and security in conjunction with the operations of the railroad and managing the liability aspects of the trail system. The costs to conduct trail management may be assessed to each agency based on the mileage of trail within their jurisdiction. The disadvantage to NCTD operating the trail is that NCTD is not in the business of maintaining or constructing trails or parks and their primary focus will be on operating a railroad and bus service.

The cities, or NCTD and MTDB, may determine that a JPA is the vehicle, which will provide the best ongoing management. The JPA agreement will detail and identify who the members are, their duties and authority, meeting and voting powers, finances, debts and liabilities, amendment procedures, and meeting times and places. Procedures for operating the trail would be adopted by the JPA as a separate document, which would allow for modifications and amendments.

Several other rail trails have elected to have a non-profit trail organization operate and maintain the trail. A non-profit corporation, owned by three counties in Pennsylvania, operates the 42 mile Youghiogheny River Trail, both a trail along an abandoned railroad right-of-way, and a rail trail along an active railroad. The non-profit corporation receives funding from the three counties, grants, adopt-a-trail programs, volunteer efforts, sale of t-shirts, and other fundraisers. The advantage to having a non-profit corporation operate the trail is that it allows and encourages active participation by the community, creates a non-biased entity, provides a dedicated organization to manage the trail, may be more self-serving as their only interest is to develop and manage the trail, may be more cost effective, and may provide a more regional, coordinated management effort. The disadvantages found in the Regional Trail Corporation are lack of uniform financial commitment by the participating agencies, limited commitment, and contradictory goals.

4.4 Operation and Maintenance

Success.f.ul operation and maintenance of the Coastal Rail Trail is of utmost importance for the productive use of the facility, and the financial and liability resources of the local jurisdictions. As discussed in the previous section, each individual agency, a single agency, a Joint Powers Authority, or a nonprofit agency may undertake operation and maintenance. This chapter identifies the issues related to the tasks associated with the actual operation and maintenance.

Operation activities on the rail trail will consist primarily of monitoring and security. Monitoring accidents, which includes identifying the primary cause of the accident and rectifying any physical deficiencies, must be accomplished by each jurisdiction. The local police department typically has the responsibility for collecting accident information and identifying responsibility, while the public works, engineering, or community services department has the responsibility for identifying and improving physical or operational conditions, which may have contributed to the accident. Additionally, the railroad operator, such as NCTD/ MTDB and the Federal Railroad Administration (FRA) maintain accident records for occurrences on the tracks. Typically, the public works department also has the responsibility for making the determination to warn trail users of conditions, and to close the trail when warranted.

Security and Safety

Most multi-use trails in the United States do not have a dedicated police patrol for the facility. It is more common for local police to patrol sections of paved trails not visible from adjacent streets on an intermittent basis. Based on other similar trails, a multi-use trail such as the Coastal Rail Trail with average usage (250,000 user days per year) or greater will require 1 man-hour per day for every 5 miles of bike path. This translates into roughly 8 man-hours per day for the entire

Coastal Rail Trail based on the current alignment. This figure would also vary by time of week and year. Off-peak weekdays may require only 3 man-hours per day, while peak weekends may require as much as 20 man-hours per day.

While each local police department is responsible for selecting the most appropriate means of patrolling their segment (if at all), it may be beneficial to patrol the Coastal Rail Trail using bicycle-mounted officers. Volunteers from local bicycling organizations could provide information to trail users and report problems to the authorities to supplement trail patrols. However, police or volunteer patrols are not required elements of a successful multi-use trail.

A summary of key security recommendations is presented below:

- Make all segments of the Coastal Rail Trail accessible, to within 500 feet, for emergency vehicles.
- Locate mileposts every mile or one half mile and identify markers on maps.
- Illuminate all grade crossings and under crossings using photosensitive triggers.
- Locate all vegetation at least 10 feet from the Coastal Rail Trail where possible.
- Design bridges and under crossings so that visibility is maximized; under crossings should be visible for entire length; use graffiti resistant materials.
- Provide bicycle racks (that allow for both frame and wheels to be locked) and lockers at transit stations and other key destinations.
- Provide fire and police departments with a map of the entire trail system, along with access points and keys/combinations to gates/bollards.
- Enforce speed limits and other rules of the road.

Studies conducted by the RTC of trails along active rail lines have shown that safety is not a significant problem. The RTC survey of 49 rails-with-trails facilities show that there has only been one recorded accident that was directly related to the trail's proximity to the railway tracks. In this case, a woman ignored the lowered gates, flashing lights, and ringing bell at a grade crossing. Considering that the existing rail trails had more than 9.2 million annual user-days, the accident rate does not indicate safety as a primary concern.[23] The Coastal Rail Trail is unique in that the corridor hosts 43 trains daily, with speeds up to 90 mph and it borders an attractive recreational element, the beach.

By way of comparison, bicyclists and pedestrians in the corridor must now ride or walk on existing roadways within several feet of up to 40,000 vehicles per day traveling upwards of 50 or 60 miles per hour. By this measurement, people's exposure to potential injury will be greatly reduced on the Coastal Rail Trail, where the number of trains is substantially lower than adjacent roadway volumes.

The fact is that people already walk along and cross the railway tracks which, without tremendous investment in fencing, maintenance, and enforcement, will continue. Providing a trail away from the railway tracks and barriers, where required, between the railway tracks and the trail, helps

[23] Rails-With-Trails Conservancy, "Rails-With-Trails, September 1997 Update", Patrick Kraich, 1997

organize and separate an activity that already exists. The railroad tracks are located adjacent to streets, sidewalks, train stations, parking lots, and other areas where they are completely unprotected. The safety concerns of a trail along the railroad tracks, set back to the far edge of the railroad right-of-way, should not be any different than an adjacent street and sidewalk. Any activity within the railroad right-of-way should be evaluated regarding safety concerns.

Safety should be addressed on the Coastal Rail Trail in the following manner:

- Adhere to the established design, operation, and maintenance standards presented in this document.
- Supplement these standards with the sound judgement of professional engineers and park maintenance personnel.
- Maintain adequate recording and response mechanisms for reported safety and maintenance problems.
- Thoroughly research and document the causes of each reported accident on the Coastal Rail Trail. Respond to accident investigations by appropriate design or operation improvements.
- Provide mile posts on the trail so that emergency response can be directed.
- Design the trail, its structures, and access points to be accessible by emergency vehicles. Bollards at the entrance to each trail segment should be removable by the appropriate fire, ambulance, and police agencies. Constrained segments of the trail that cannot accommodate emergency vehicles should not be longer than 500 feet.
- Establish a liaison with the railroad operations department to respond to safety concerns.

Special Safety Features

Special features, which may enhance the safety on the Coastal Rail Trail, include the use of solar-powered phones, panic buttons, and closed-circuit television. However, no conclusive proof exists that these devices are effective at reducing crime or improving response time. Installation of solar phones or closed circuit televisions (CCTV) may be warranted when it has been determined that a safety problem exists. They would need to be monitored 24 hours per day in order to be effective and not represent a liability to the trail manager.

Solar phones, similar to those being installed by CalTrans along highways, offer a more cost effective approach that may be appropriate to certain sections of the Coastal Rail Trail. They are not intended, however, to be a primary response mechanism for emergencies but rather a support feature. Undercrossings that exceed 75 feet in length are good candidate locations for phones, as a supplement to appropriate lighting. The Vasona Trail in Santa Clara County installed solar phones, which are maintained by the County Parks. Emergency calls are immediately transferred to the appropriate Police/Fire service.

A typical concern expressed by people familiar with the Coaster train is that they cannot hear the train when it is approaching. Flashing lights located along the trail to alert trail users that a train is coming may be desirable.

Monitoring

Specific responsibilities should be assigned within each city to individuals responsible for monitoring the implementation of the Coastal Rail Trail over time or with a Joint Agency Trail Manager. This Trail Coordinator/Manager might be responsible for the following:

- ensuring appropriate design and construction standards.
- acting as clearinghouse for all reported maintenance and safety problems,
- collecting information from and dispersing information to the appropriate departments
- working with local public advocacy and advisory bodies in the design and operation of the trail,
- preparing funding applications to implement and maintain the trail,
- administering grant programs,
- maintaining maintenance log,
- conducting fundraising events to fund additional amenities for the trail
- managing volunteer programs for maintenance and/or monitoring safety practices, and
- developing fundraising products for distribution,
- managing trail events, and
- conducting "adopt a trail" programs.

Maintenance

Regular maintenance and maintenance logs are essential to ensuring that the facility remains an asset to the community and, most importantly, reduces liability. Many of these maintenance items are dependent on the type and amount of landscaping and supporting infrastructure that is developed along the trail. It is recommended that a consistent maintenance procedure be developed for each jurisdiction along the Rail Trail to ensure, at a minimum, that the facility is safe for trail users. Each jurisdiction should have a mechanism to identify, record, and respond to maintenance problems, and to keep written records of such actions.

Special maintenance equipment such as a sweeper may be purchased jointly by all local jurisdictions, if a joint agency does not manage the trail, thereby reducing costs. Typical maintenance vehicles for the trail will be light pick up trucks, sweepers, and occasionally heavy dump trucks and tractors. Care should be taken when operating heavier equipment on the Coastal Rail Trail to warn trail users and to avoid breaking edges of the trail surface.

If the Coastal Rail Trail serves as a maintenance access road for the railroad, the trail width and pavement section should reflect the anticipated weight and frequency of vehicles. Agreements with the railroad on access to the trail and methods of warning trail users when track repair is in progress should be developed as part of the easement process.

Table 4 shows the regular maintenance activities required for the Coastal Rail Trail.

Table 4
Maintenance Schedule

Item	Frequency
Sign replacement and repair	1-3 years
Pavement marking replacement	1-3 years
Tree, shrub, & grass trimming/fertilization	5 months - 1 year
Pavement sealing/potholes	5-15 years
Clean drainage system	1 year
Pavement sweeping	Monthly - annually as needed
Shoulder & grass mowing	as needed
Trash disposal	as needed
Lighting replacement/repair	1 year
Graffiti removal	weekly - monthly as needed
Maintain furniture	1 year
Fountain/restroom cleaning/repair	weekly - monthly as needed
Pruning	1 - 4 years
Bridge/tunnel inspection	1 year
Remove fallen trees	as needed
Weed control	monthly - as needed
Maintain emergency phones, CCTV	1 year
Maintain irrigation lines/ replace sprinklers	1 year
Irrigate/water plants	weekly - monthly as needed

The total estimated annual maintenance cost for the Class I portion of the Coastal Rail Trail is $375,000 for the 32-mile alignment. This is based on an industry-standard of $8,500 per mile of bike path annually. In areas where there is landscaping, irrigation, parklike amenities, the costs for maintenance would be much greater.

The Coastal Rail Trail will be located parallel or adjacent to private properties along most of its proposed alignment. Most of the corridor is currently used for access, however increased use may result in a perceived sense of loss of privacy and security. Neighbor concerns typically include a loss of visual privacy, increased crime, vandalism, noise, and fire. Wherever feasible, the trail should be located as far away from residences as possible to protect the privacy of homeowners. New privacy fencing is generally not required as part of the rail trail project as most land owners have already taken measures to screen their property from existing passenger trains and informal users of the right-of-way. Fencing types, designs, and landscaping suggestions may be provided to property owners so that they can select the most appropriate type of privacy barrier for their property.

Studies conducted by Sonoma State University[24], City of Escondido[25], and the Rails-to-Trails Conservancy[26] have shown that new multi-use trails do not result in increased crime to adjacent

[24] Brush Creek Trail Study, Sonoma State University, 1992.

[25] City of Escondido, Report on Safety for Escondido Creek Channel Bike Path, November 1998.

property owners. Criminal activity is not likely to occur along a trail that is well planned, designed, operated, maintained, and monitored. Both the City of Escondido and the Rails-to-Trails Conservancy reports indicated that trails actually tend to reduce crime by cleaning up the landscape and attracting people who use the trail for recreation and transportation.

Trail users will need to be managed during construction and periodic maintenance of the rail trail, when sections of the trail will be closed or unavailable to trail users. Trail users must be warned of impending trail closures, and given adequate detour information to bypass the closed or unfinished section of trail. This can be accomplished through the use of standard signage at the entrance to each affected section of trail (i.e. "Trail Closed"), including (but not limited to) information on alternate routes and dates of closure. Sections of the trail that are closed must be gated or otherwise blockaded and clearly signed as closed to public use. Trail users should be directed to alternate routes on nearby surface streets.

4.5 Project Costs

Project costs include clearing, demolition, grading, and construction of the path. Separate line items are included for at-grade crossing treatments, bridges, drainage structures, signs, and striping. Unit prices for site amenities such as trash receptacles, benches, drinking fountains, solar emergency call boxes, and lighting are listed as optional items. The cost estimates are preliminary only. More detailed estimates will be prepared during the final design phases for each construction project.

The cost estimates were prepared based the following assumptions:

1. Grading width is 20'. Paved trail is 12' wide with 2' shoulders.
2. Fencing is included in specific areas where noted. Fencing costs may vary based the type of fencing selected by each city and the specific use, i.e., constraining or delineation, however the cost estimate used equates to a welded-wire mesh fence or one similar to quality.
3. Asphalt costs are based on 3" thick with 6' base.
4. Optional items are not included in the final construction costs estimates.
5. Street grade crossings costs include signing, striping, loop detectors, and median modification improvements.
6. Cost for improvements for unsignalized roadway crossings for low volume streets are included in overall striping and signing costs.
7. Specific costs are identified for unsignalized arterial crossings, which will require flashing warning lights.
8. Landscaping and irrigation under optional items is assumed for a 5' wide landscaped and irrigated section on both sides of the trail.
9. At-grade crossings are "typical" at-grade pedestrian costs. Costs may vary depending on distance to connect to nearest railroad crossing.

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[26]Rail trails and Safe Communities, the Experience on 372 Trails, Rails to Trails Conservancy in cooperation with National Park Service, January 1998.

COASTAL RAIL TRAIL
PRELIMINARY COST ESTIMATE

DESCRIPTION	UNIT	UNIT PRICE	City of Oceanside QUANTITY	City of Oceanside COST	City of Carlsbad QUANTITY	City of Carlsbad COST	City of Encinitas QUANTITY	City of Encinitas COST	City of Solana Beach QUANTITY	City of Solana Beach COST	City of Del Mar QUANTITY	City of Del Mar COST	City of San Diego QUANTITY	City of San Diego COST	PROJECT QUANTITY	PROJECT COST
CONSTRUCTION																
Grading (20' wide) (Del Mar = 9' wide)	CY	$ 8.00	8,840	$ 70,720	29,500	$ 236,000	22,358	$ 178,864	8,400	$ 67,200	3,000	$ 24,000	10,380	$ 83,040	82,478	$ 659,824
Bench Grading	LF	$ 7.50	-		-		8,000	$ 60,000		$ -		$ -		$ -	8,000	$ 60,000
Asphalt Paving (4" thick)	SF	$ 1.30	129,912	$ 168,886	354,000	$ 460,200	268,296	$ 348,785	100,800	$ 131,040		$ -	958,400	$ 1,245,920	1,811,408	$ 2,354,830
Cl II Agg Base (6" Thick)	SF	$ 0.80	129,912	$ 103,930	354,000	$ 283,200	268,296	$ 214,637	100,800	$ 80,640		$ -	958,400	$ 766,720	1,811,408	$ 1,449,126
PCC Paving (7")	SF	$ 4.50								$ -		$ -	106,000	$ 477,000	106,000	$ 477,000
Fencing - 8' Chain Link	LF	$ 30.00	1,558	$ 46,740	10,150	$ 304,500	5,300	$ 159,000	8,400	$ 252,000		$ -	44,950.00	$ 1,348,500	70,358	$ 2,110,740
Fencing - 4' Chain Link	LF	$ 8.50								$ -		$ -	5,000.00	$ 42,500	5,000	$ 42,500
AC Overlay	SF	$ 0.50	25,000	$ 12,500	-	$ -	-	$ -		$ -		$ -		$ -	25,000	$ 12,500
Drainage	LS	$ 33,000.00	-	$ -	-	$ -	1	$ 33,000	1	$ 16,500		$ -	3.00	$ 99,000	5	$ 148,500
Striping & Signing	LF	$ 1.25	17,800	$ 22,250	38,500	$ 48,125	32,880	$ 41,100	8,400	$ 10,500	26,060	$ 32,563	117,200.00	$ 146,500	121,630	$ 298,538
Street/Creek Crossing	EA	$ 15,000.00	8	$ 120,000	6	$ 90,000	6	$ 90,000	2	$ 30,000	6	$ 90,000	15.00	$ 225,000	43	$ 645,000
New Signalized Street Crossings	EA	$ 50,000.00	-	$ -	2	$ 100,000		$ -		$ -		$ -		$ -	2	$ 100,000
At Grade Crossing	EA	$ 100,000.00	-	$ -	1	$ 100,000	2	$ 200,000		$ -	4	$ 400,000	1.00	$ 100,000	8	$ 800,000
Easement Acquisition	SF	$ 2.50	10,000	$ 25,000	47,572	$ 118,930	10,000	$ 25,000		$ -		$ -		$ -	67,572	$ 168,930
Retaining Wall	SF	$ 40.00	2,660	$ 106,400	4,520	$ 180,800	12,560	$ 502,400		$ -		$ -	1,720	$ 68,800	21,460	$ 858,400
Bridge @ Agua Hedionda Lagoon	SF	$ 200.00	-	$ -	3,520	$ 704,000	-	$ -		$ -		$ -		$ -	3,520	$ 704,000
Bridge @ Jimmy Durante	LS	$ 230,000.00								$ -	1	$ 230,000		$ -	1	$ 230,000
Pedestrian Overcrossing	EA	$ 375,000.00							2	$ 750,000		$ -	2.00	$ 750,000	4	$ 1,500,000
Bridge @ Drainage Channel	SF	$ 100.00	-	$ -	800	$ 80,000	960	$ 96,000		$ -		$ -	2,400.00	$ 240,000	4,160	$ 416,000
Mobilization	LS	$ 10,000.00	1	$ 10,000	1	$ 10,000	1	$ 10,000	1	$ 10,000		$ -	15	$ 150,000	19	$ 190,000
Clear & Grub	AC	$ 8,000.00	5	$ 40,000	13.5	$ 108,000	10.3	$ 82,400	3.1	$ 24,800		$ -	0.60	$ 4,800	33	$ 260,000
Furnish & Install Project Signs	EA	$ 1,500.00	2	$ 3,000	2	$ 3,000	2	$ 3,000	2	$ 3,000		$ -		$ -	8	$ 12,000
Safety Railing	LF	$ 90.00	250	$ 22,500	750	$ 67,500	300	$ 27,000		$ -		$ -		$ -	1,300	$ 117,000
Grind Pavement for Overlay	SF	$ 0.25	25,000	$ 6,250	-	$ -	-	$ -		$ -		$ -		$ -	25,000	$ 6,250
Facility & Utility Relocation	Mile	$ 10,000.00	2.05	$ 20,504	5.59	$ 55,871	4.23	$ 42,348		$ -		$ -		$ -	12	$ 118,723
Adjust Manhole	EA	$ 490.00								$ -		$ -	1	$ 490	1	$ 490
Traffic Control	LS	$ 10,000.00	1.00	$ 10,000	1.00	$ 10,000	1.00	$ 10,000	1	$ 10,000		$ -	5.00	$ 50,000	9	$ 90,000
Erosion Control	AC	$ 1,000.00	5.00	$ 5,000	13.5	$ 13,500	10.3	$ 10,300	3.1	$ 3,100		$ -	20.00	$ 20,000	52	$ 51,900
Landscape & Irrigation	SF	$ 4.25	108,280	$ 460,105	290,000	$ 1,232,500	223,580	$ 950,215	82,400	$ 350,200		$ -	849,000.00	$ 3,608,250	1,553,240	$ 8,601,270
Construction Subtotal				$ 1,253,784		$ 4,203,625		$ 3,084,049		$ 1,728,980		$ 776,563		$ 9,426,523		$ 20,483,524
Contingency 20%				$ 250,757		$ 840,725		$ 616,810		$ 347,796		$ 155,313		$ 1,885,305		$ 4,096,705
Construction Total				$ 1,504,541		$ 5,044,351		$ 3,700,859		$ 2,086,776		$ 931,875		$ 11,311,827		$ 24,580,229
AMENITIES (Class I section only)																
Trash Receptacles (5/mi)	EA	$ 300.00	10	$ 3,078	28	$ 8,400	21	$ 6,300	8	$ 2,400			80.00	$ 24,000	147	$ 44,176
Benches (5/mi)	EA	$ 65.00	10	$ 650	28	$ 1,820	21	$ 1,365	8	$ 520			80.00	$ 5,200	147	$ 9,555
Drinking Faucets (1/mi)	EA	$ 2,000.00	2	$ 4,000	6	$ 12,000	4	$ 8,000	2	$ 4,000			16.00	$ 32,000	30	$ 60,000
Water Main Connection (1/mi)	EA	$ 5,000.00	2	$ 10,000	6	$ 30,000	4	$ 20,000	2	$ 10,000			16.00	$ 80,000	30	$ 150,000
Solar Call Boxes (1/mi)	EA	$ 5,000.00	2	$ 10,000	6	$ 30,000	4	$ 20,000	2	$ 10,000			16.00	$ 80,000	30	$ 150,000
Lighting (300'/)	EA	$ 5,000.00	36	$ 180,000	98	$ 490,000	75	$ 375,000	57	$ 285,000			350.00	$ 1,750,000	616	$ 3,080,000
Bike Racks (1/mi)	EA	$ 350.00	2	$ 700	6	$ 2,100	4	$ 1,400	2	$ 700			16.00	$ 5,600	30	$ 10,500
Public Art (1% Construction)	LS	1%		$ 15,045		$ 50,444		$ 37,009		$ 20,868		$ -			-	$ 123,365
Amenities Subtotal				$ 223,471		$ 574,320		$ 432,065		$ 312,620		$ -		$ 1,976,800		$ 3,504,231
Contingency (20%				$ 44,694		$ 114,864		$ 86,413		$ 62,524		$ -		$ 395,360		$ 700,848
Amenities Total				$ 268,165		$ 689,184		$ 518,478		$ 375,144		$ -		$ 2,372,160		$ 4,205,077
SOFT COSTS																
Final Engineering Design & Topography (15%)				$ 225,681		$ 756,653		$ 555,129		$ 313,016		$ 139,781		$ 1,698,774		$ 3,687,034
Environmental & Permits (10%)				$ 150,454		$ 504,435		$ 370,086		$ 208,678		$ 93,188		$ 1,131,183		$ 2,456,158
Legal, Appraisal, R/W & Misc (5%)				$ 75,227		$ 252,218		$ 185,043		$ 104,339		$ 46,594		$ 565,591		$ 1,078,079
Project Management (5%)				$ 75,227		$ 252,218		$ 185,043		$ 104,339		$ 46,594		$ 565,591		$ 1,078,079
Railroad Plan Check, Inspection & Flagging (5%)				$ 75,227		$ 252,218		$ 185,043		$ 104,339		$ 46,594		$ 565,591		$ 1,078,079
Inspection (7%)				$ 105,318		$ 353,105		$ 259,060		$ 146,074		$ 65,231		$ 791,828		$ 1,509,316
Surveying (3%)				$ 45,136		$ 151,331		$ 111,028		$ 62,609		$ 27,956		$ 339,354.81		$ 646,847
Soft Costs Total				$ 752,270		$ 2,522,176		$ 1,850,429		$ 1,043,388		$ 465,938		$ 5,655,914		$ 11,233,587
PROJECT TOTAL				$ 2,524,976		$ 8,255,711		$ 6,069,766		$ 3,505,308		$ 1,397,813		$ 19,339,901		$ 40,018,893

Prepared by Helming Engineering Sept. 12, 2000 based on quantities from Translech Estimate, discussion with Dokken Engineering and additional field review
Modified Oct. 1, 2000 to include City of San Diego
Modified Oct. 25, 2000 to include Cities of Solana Beach & Del Mar

These have changed with the 30% design est.

5.0 Trail Alignment

The entire 44-mile railway corridor was evaluated to determine whether it was economically viable and environmentally sound to construct a multi-use path along the right-of-way for the entire distance from Oceanside to San Diego. Preliminary analysis of the corridor was conducted and potential alternatives were explored by walking along the right-of-way, reviewing available mapping, and scrutinizing aerial photographs. The alignment was divided into 11 distinct project segments within each city for closer evaluation. The methodology used to identify various alternatives and recommend the preferred alignment, included the following considerations:

- Available width of the railroad right-of-way;
- Physical obstructions of the railroad right-of-way;
- Access to transit stations;
- Utilization of existing informal trails;
- Environmental constraints; and
- Cost.

The final alignment discussed in this chapter and presented in the detailed project alignment drawings (Drawing No. 376-9) following the Appendices, represents a conscientious effort to locate a multi-use path in logical, non-prohibitive areas. The preliminary study completed in 1989 by Morrison-Knudsen considered trail bridges across the five lagoons that separate each of the northern coastal cities. However, upon further review in conjunction with this PSR, construction of the pathway across the lagoons is not being considered at this time, except a proposed bridge over an existing sewer line across the Agua Hedionda Lagoon in Carlsbad. Construction of new bridges across the lagoons or construction of a bridge extension along existing railway trestles would be cost prohibitive and environmentally constrained. Avoidance of the lagoons does not reduce the overall continuity and benefits of the Coastal Rail Trail.

In the future, further analysis of a trail across one or more of the lagoons may be considered when the SDNR explores reconstruction of existing bridges or construction of new bridges to accommodate increased rail services. At that time, local agencies may encourage the construction of a separate Class I trail in conjunction with the SDNR project(s). Additionally, NCTD is conducting a Capital Study Master Plan for the entire railroad right-of-way, which could impact the alignment of the Coastal Rail Trail.

At each lagoon, the trail will utilize existing Class II bicycle lanes along Highway 101 (Coast Highway). In downtown San Diego, the Coastal Rail Trail will divert to Pacific Coast Highway bicycle lanes due to a constrained right-of-way and high traffic volumes on east-west major roads. The railway currently has two tracks from the Old Town Transit Center to the Santa Fe Depot. Future plans identify four tracks to accommodate light rail trolley service and AMTRAK/Coaster service.

In order to ensure accessibility from residential developments to the beach there are numerous at-grade bicycle/pedestrian crossings identified. Although these are viable options for safe railroad crossings, each of these at-grade crossings will be addressed separately, either by each individual

jurisdiction or jointly by more than one agency. The City of Solana Beach has proposed and will develop two overcrossings as part of their Linear Park Project.

This chapter describes each of the 11 segments of the Coastal Rail Trail as the alignment proceeds north to south..

5.1 Segment 1: City of Oceanside, San Luis Rey River Path to Buena Vista Lagoon

The Coastal Rail Trail begins at the northern end of the City of Oceanside, at the San Luis Rey River Bicycle Path (a separate City of Oceanside project) on the eastern side of the tracks. The Class I pathway would proceed south along the eastern side of the right-of-way where there is sufficient width except near Surfrider Way and between Pier View Way and Civic Center Drive where two public parking lots have been constructed. The trail would divert around two parking lots utilizing adjacent streets. Standardized Coastal Rail Trail signs consistent with the Project Study Report would be erected to identify the Class III bicycle route along these streets.

To avoid diverting in and out of the rail right-of-way, the trail would head easterly on Neptune Way to Cleveland Street. At Cleveland Street, the trail would cross over Surfrider Way, Sportfisher Way, Civic Center Drive, Pier View Way, Mission Avenue, and Seagaze Way. At Seagaze Way, the trail would go easterly to Tremont Street where it would proceed south past the Oceanside Transit Center. The trail would proceed past the transit station to Missouri Avenue. At Missouri Avenue, the trail would proceed westerly accessing the eastern side of the railway right-of-way. The Coastal Rail Trail project would proceed southerly within the railroad right-of-way along the east side of the tracks to Oceanside Blvd. The trail would proceed as a Class II bikeway west two blocks to Pacific Street where it would utilize a Class III bicycle route to Buccaneer Beach Park.

At Buccaneer Beach Park, bicyclists would connect to an existing pedestrian path, which traverses along the north side of the Park and proceeds easterly under the railway trestle. An approximate 60' long retaining wall would be constructed under the railroad trestle. The height of the wall would vary from 2' to 8' above top of footing. Approximately 280 s.f. of retaining wall would be constructed in this location to accommodate the width of the bicycle path. The pedestrian path would be widened to a 12' wide multi-use Class I trail and would connect to the eastern edge of the railroad right-of-way. The trail would then proceed south along the right-of-way to Vista Way, just north of the Buena Vista Lagoon, where it would utilize Class III route to Coast Highway Class II bicycle lanes.

Table 6 Segment 1: San Luis Rey River Path to Buena Vista Lagoon City of Oceanside		
Total Length	Class I - 2.05 miles (3.30 km) Class II - .96 miles (1.55 km) Class III - .35 miles (.56 km)	3.36 miles (5.41 km)
ROW width		65'-200'
Arterial Grade Crossings (Mission Ave., Oceanside Blvd., Cassidy Ave.)		3
Undercrossings (Buccaneer Park)		1
Bridges/Overcrossings		0
Collector/Local Grade Crossings (Oceanside Blvd., Wisconsin, Surfrider Way, Pierview Way, Seagaze Way, Michigan Avenue)		6
At-grade Pedestrian R/R Crossings		0

Major Destinations	
Recreational	Commuter
Oceanside Beaches, Harbor & Pier	Oceanside Transit Station
Buccaneer Beach Park	Downtown Oceanside retail and business district
Pacific Street Linear Park	Camp Pendleton
Oceanside-Escondido Rail Trail (proposed)	Oceanside City Hall, Library, and Art Center
San Luis Rey River Bicycle Path	
Library and Art Center	

FIGURE 5.1	SEGMENT #1 SAN LUIS REY RIVER TO BUENA VISTA LAGOON	COASTAL RAIL TRAIL

5.2 Segment 2: City of Carlsbad, Buena Vista Lagoon to Agua Hedionda Lagoon

Southbound users would proceed south along Coast Highway on Class II bicycle lanes. The trail would divert from Class II bikes lanes through city-owned property at the Home Plant Lift Station. The trail would follow along the southern boundary of the lift station property and would access the eastern side of the right-of-way. A retaining wall would be needed to support the slope from the northerly bridge abutment.

The retaining wall would be approximately 200' in length with height varying from 4' – 8' above top of footing. The area of the wall would be approximately 1,200 s.f.

The trail would follow the railroad right-of-way to the Carlsbad Village Transit Station parking lot. There the trail would proceed along the northern edge of the parking lot to State Street. The trail would utilize a Class III bicycle route to along State Street to Oak Street where the trail would access the eastern edge of the railroad right-of-way. A Class I bicycle path would be constructed within the eastern edge of the right-of-way proceeding south. At Chestnut Avenue, an at-grade pedestrian/bicycle crossing would be constructed in order to allow bicycle/pedestrian access to Chestnut Avenue on the west side of the tracks. The Class I bicycle path would continue along the eastern edge of the right-of-way to the north side of the Agua Hedionda Lagoon.

Table 7
Segment 2: Buena Vista Lagoon -Agua Hedionda Lagoon
City of Carlsbad

Total Length	Class I - 1.80 (2.90 km) Class II - .1.04 (.1.67 km) Class III - .36 (.58 km)	3.2 miles (5.15 km)
ROW width		100'-200'
Arterial Grade Crossings (Carlsbad Village Drive)		1
Undercrossings (South side of Buena Vista Lagoon)		1
Bridges/overcrossings		0
Collector/Local Grade Crossings (Grand Avenue, Oak Avenue, & Tamarack)		3
At-grade Pedestrian R/R Crossing (Chestnut Ave.)		1

Major Destinations	
Recreational	Commuter
Hotels/Motels	Carlsbad Village Retail and Business district
Encina Public Fishing Area	Carlsbad Village Coaster Station
Carlsbad State Beach	Army/Navy Academy
Carlsbad Village	Kaiser Hospital Medical Offices
Legoland Amusement Center	

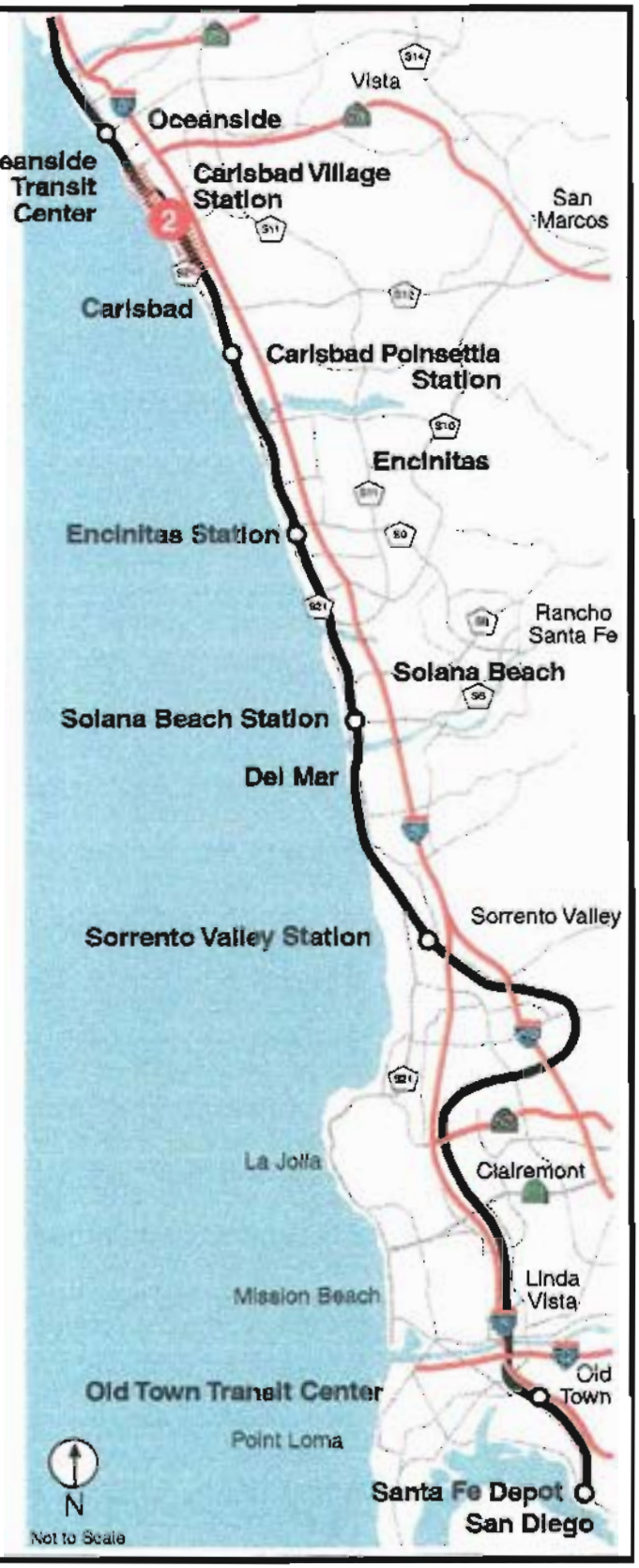


FIGURE 5.2	SEGMENT #2 BUENA VISTA LAGOON TO AGUA HEDIONDA LAGOON	COASTAL RAIL TRAIL

5.3 Segment 3: City of Carlsbad, Agua Hedionda Lagoon to Batiquitos Lagoon

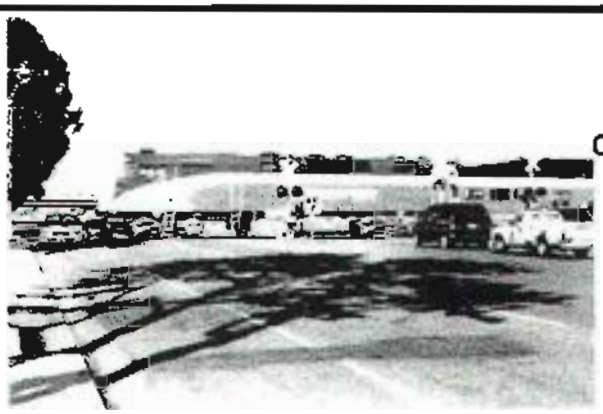
The trail proceeds south crossing the Agua Hedionda Lagoon on a bridge spanning the channel for approximately 220' in length. The bridge design would accommodate the future 48" to 54" Vista/Carlsbad Interceptor Sewer Main. The bridge design would not place supporting columns or falsework in the channel. The Class I bicycle path would continue south along the Agua Hedionda Sewer Pump Station. A retaining wall would be necessary for approximately 600' in length with varying heights up to 10'.

The trail continues as a Class I bicycle path along the easterly side of the right-of-way. A short bridge or structure, approximately 50' in length, would be constructed over the storm drain inlet between Cannon Road and Palomar Airport Road. The trail would proceed south to the Poinsettia Transit Station continuing on Class II bicycle lanes to Avenida Encinas. The trail continues on Avenida Encinas southerly to the Carlsbad Boulevard/Avenida Encinas intersection. The intersection would require improvements to include sidewalks and loop detectors. At Carlsbad Boulevard, the trail proceeds south on Class II bicycle lanes across the Batiquitos Lagoon, while providing access to the Carlsbad State Beach.

Table 8
Segment 3: Agua Hedionda Lagoon - Batiquitos Lagoon
City of Carlsbad

Total Length	Class I - 3.68 mi. (5.79 km) Class II - .40 mi. (.64 km)	4.08 miles (6.43 km)
ROW width		100'-200'
Arterial Grade Crossings (Cannon Road, Avenida Encinas)		2
Undercrossings (Poinsettia)		1
Bridges/Overcrossings (Agua Hedionda Lagoon, and north of Palomar Airport Road)		1
Collector/Local Grade Crossings		0
At-Grade Pedestrian R/R Crossing		0

Major Destinations	
Recreational	Commuter
Hotels/Motels, Restaurants	Hotels/Motels, Restaurants
South Carlsbad State Beach	Poinsettia Station
Legoland Amusement Center	Industrial Center (east from Palomar Airport Road)
	Palomar Airport
	Kaiser Hospital Medical Offices
	Businesses along Avenida Encinas



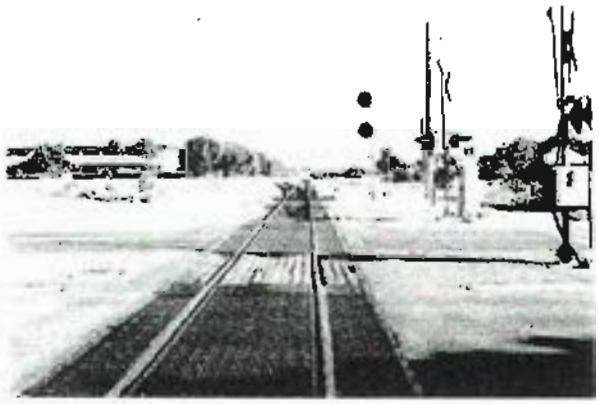


FIGURE 5.3	SEGMENT #3 AGUA HEDIONDA LAGOON TO BATIQUITOS LAGOON	COASTAL RAIL TRAIL

5.4 Segment 4: City of Encinitas, Batiquitos Lagoon to the Encinitas Station

The trail would proceed south on Class II bicycle lanes along Coast Highway to the City of Encinitas. At the signalized La Costa Avenue intersection and Coast Highway, users would enter the western edge of the railroad right-of-way. This intersection will be modified by the City of Encinitas to accommodate the Coastal Rail Trail and will include accommodations for a Class I bicycle path along the west side of the rail road right-of-way.

The trail continues south along the western side of the right-of-way towards Encinitas Boulevard replacing an existing 4' wide bike path currently located within the right-of-way. At Marcheta Street/Orpheus Avenue, a bicycle/pedestrian at-grade crossing would be constructed to the east side of the right-of-way. Proceeding south to Encinitas Boulevard the trail continues as a Class I bicycle path along the eastern edge of the railroad right-of-way. The trail would cross Encinitas Boulevard at the intersection of Encinitas Boulevard and Vulcan Avenue and continue to the Encinitas Transit Station.

Table 9
Segment 4: Batiquitos Lagoon - Encinitas Station
City of Encinitas

Total Length - Class I - 2.65 miles (4.26 km) Class II - .45 miles (.72 km)	3.1 miles (4.98 km)
ROW width	100'
Arterial Grade Crossings (La Costa Avenue, Leucadia Blvd, Encinitas Blvd)	3
Undercrossings	0
Bridges/Overcrossings	0
Collector/Local Grade Crossings	0
At-grade Pedestrian R/R Crossings (Grandview St./Hillcrest Dr., between Jason/E. Jason St.'s and Glaucus/E. Glaucus St.'s and Marcheta St./Orpheus Ave.)	3

Major Destinations	
Recreational	Commuter
Ponto Beach State Park	Paul Ecke Central Elementary School
North Coast Highway 101 Commercial Corridor	North Coast Highway 101 Commercial Corridor
City Beaches (Grandview, Beacons, Stone Steps, and Moonlight)	Encinitas Station
City Parks (Leucadia Roadside, Orpheus, and Encinitas Viewpoint)	Encinitas City Hall, Library
Downtown Old Encinitas	Downtown Old Encinitas

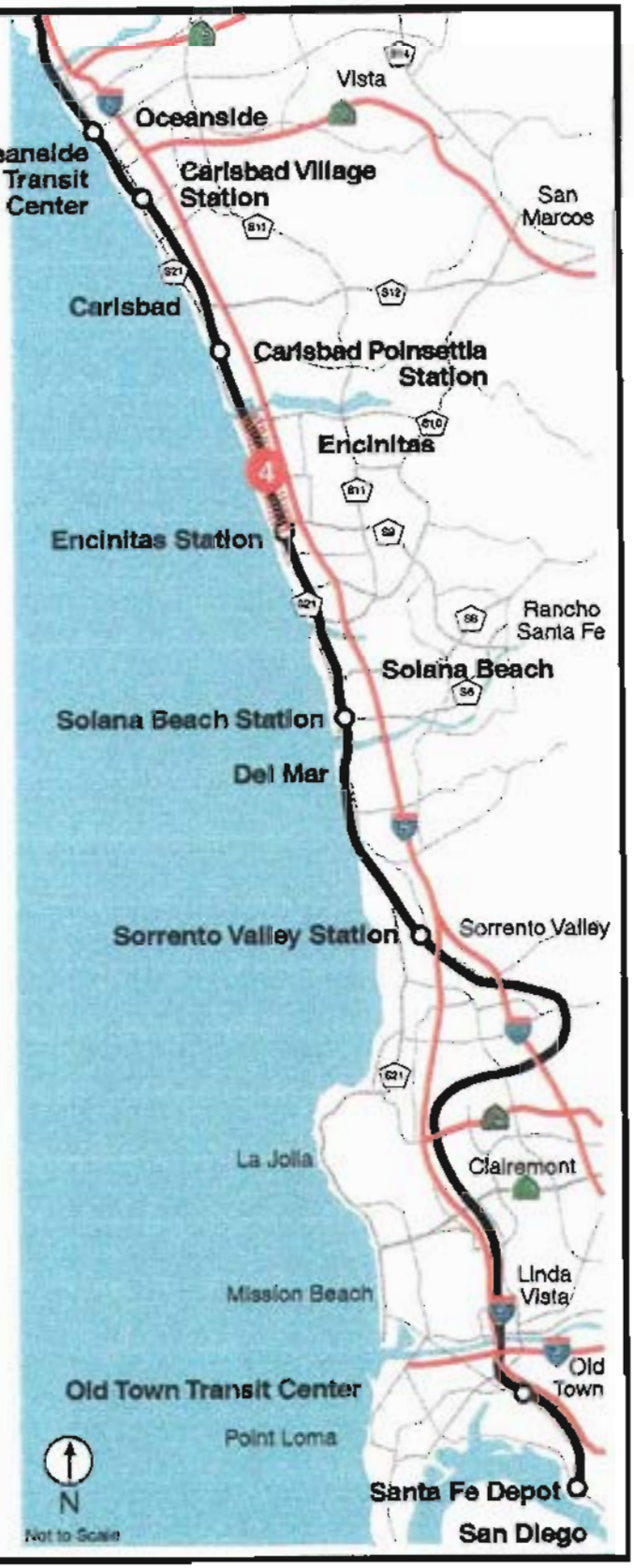


FIGURE 5.4	SEGMENT #4 BATIQUITOS LAGOON TO ENCINITAS STATION	COASTAL RAIL TRAIL

5.5 Segment 5: City of Encinitas, Encinitas Station to San Elijo Lagoon

The trail would divert to the eastside of the railroad right-of-way at E Street and proceed south to Chesterfield Drive. The terrain with the right-of-way varies and short retaining walls may be necessary to develop the trail within this section. The trail would not impact the existing unimproved parking along San Elijo Avenue since the Class I path drops below the road. Just north of Chesterfield Drive, a bridge (adjacent to the existing pedestrian bridge) would be constructed to accommodate bicycles and additional non-motorized traffic. This bridge would be of similar construction as to the existing 5' wide pedestrian bridge and of similar length, approximately 60'.

At Chesterfield Drive, the trail crosses the tracks at the intersection and joins the existing Class II bike lanes on South Coast Highway 101, and proceeds south across the San Elijo Lagoon to the City of Solana Beach.

Due to the active use of residents and visitors accessing the beach, Downtown Old Encinitas, and the San Elijo State Campground, four new at-grade pedestrian crossings are proposed, in addition to the three existing at-grade street crossings at D Street, E Street, and Chesterfield Drive. These would be located at East I Street, Santa Fe Drive, Montgomery Avenue, and Birmingham Drive.

Table 10
Segment 5: Encinitas Station - San Elijo Lagoon
City of Encinitas

Total Length Class I - 1.58 miles (2.54 km) Class II - .45 miles (.72 km) Class III - .29 miles (.46 km)	3.12 miles (5.02 km)
ROW width	70-200'
Arterial Grade Crossings (Chesterfield Dr.)	1
Undercrossings	0
Bridges/Overcrossings	0
Collector/Local Grade Crossings (D St. and E St.)	2
At-Grade Pedestrian R/R Crossings (East I St., Santa Fe Drive, Montgomery Avenue, Birmingham Drive)	4

Major Destinations	
Recreational	Commuter
Downtown Old Encinitas	Encinitas Station
City Beaches (Moonlight, D Street, Swami's),	Downtown Old Encinitas
City Parks (Mildred Macpherson, George Berkich, and Glen)	Encinitas City Hall, Library Cardiff Elementary School
State Beaches (Moonlight, San Elijo, Cardiff)	Downtown Cardiff

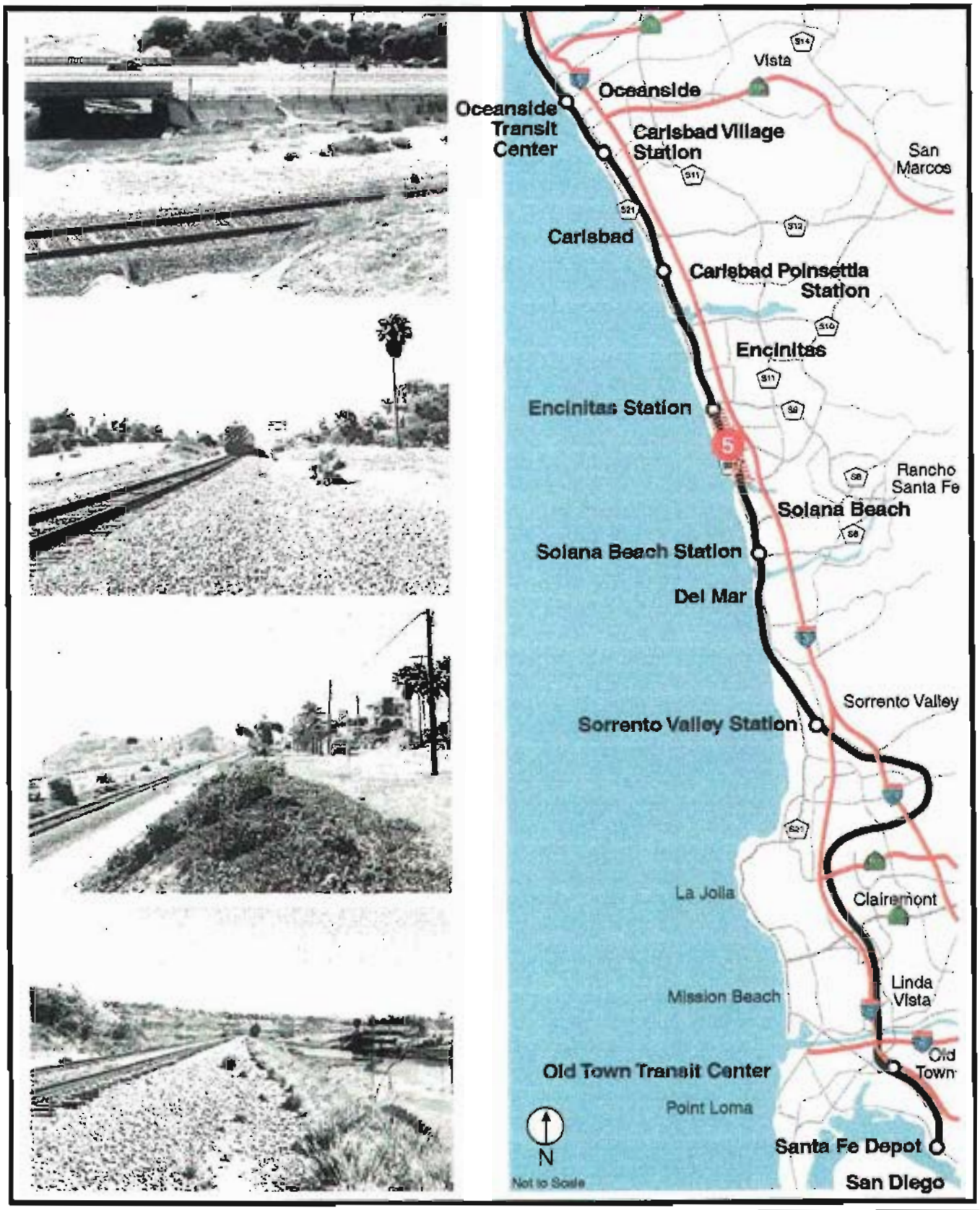


FIGURE 5.5	SEGMENT #5 ENCINITAS STATION TO SAN ELIJO LAGOON	COASTAL RAIL TRAIL

5.6 Segment 6: City of Solana Beach, San Elijo Lagoon to Via de la Valle

The trail would proceed south to Cliff Street crossing the street at an existing signalized intersection to access the western edge of the railroad right-of-way. The Class I bicycle path would proceed south through the City of Solana Beach, crossing Lomas Santa Fe Road and continuing to Via de la Valle in the City of Del Mar.

The City of Solana Beach has prepared and adopted the Solana Beach Linear Park Master Plan, which provides design guidelines for the rail trail through their city. Ultimately, the City's plans include construction of landscaped nodes, a nature walk along San Elijo lagoon, parklike amenities, and bridge overcrossings at Cliff Street and Rosa Street.

Jointly NCTD and the City of Solana Beach completed the Lomas Santa Fe Grade Separation project, which lowered the railroad 35 feet below grade and adds a passing track. The project began construction in May of 1998 and was completed in spring 2000. The remaining right-of-way along the westside of the railway has been identified for a multi-use pathway. The trail will proceed across Lomas Santa Fe at the intersection. The rail trail diverts from the tracks at the south end of the city at the Via de la Valle intersection and proceeds south towards the City of Del Mar on existing Class II bicycle lanes on Camino Del Mar.

Table 11
Segment 6: San Elijo Lagoon - Via de la Valle
City of Solana Beach

Total Length - Class I - 1.56 miles (2.51 km)	1.56 miles
ROW width	70'-100'
Arterial Grade Crossings (Lomas Santa Fe, Cliff Street/ Highway 101)	2
Undercrossings	0
Bridges/Overcrossings (Cliff Street, Rosa Street)	2
Collector/Local Grade Crossings	0
At-Grade pedestrian R/R Crossings	0

Major Destinations	
Recreational	Commuter
Visitors Information Center	City Hall
Tide Beach City Park	Transit Station
Fletcher Cove Park	South Cedros Design District
Seascape Surf	Hwy 101 Commercial & Retail
Del Mar Shores Beach Park	
Del Mar Racetrack and Fairgrounds	

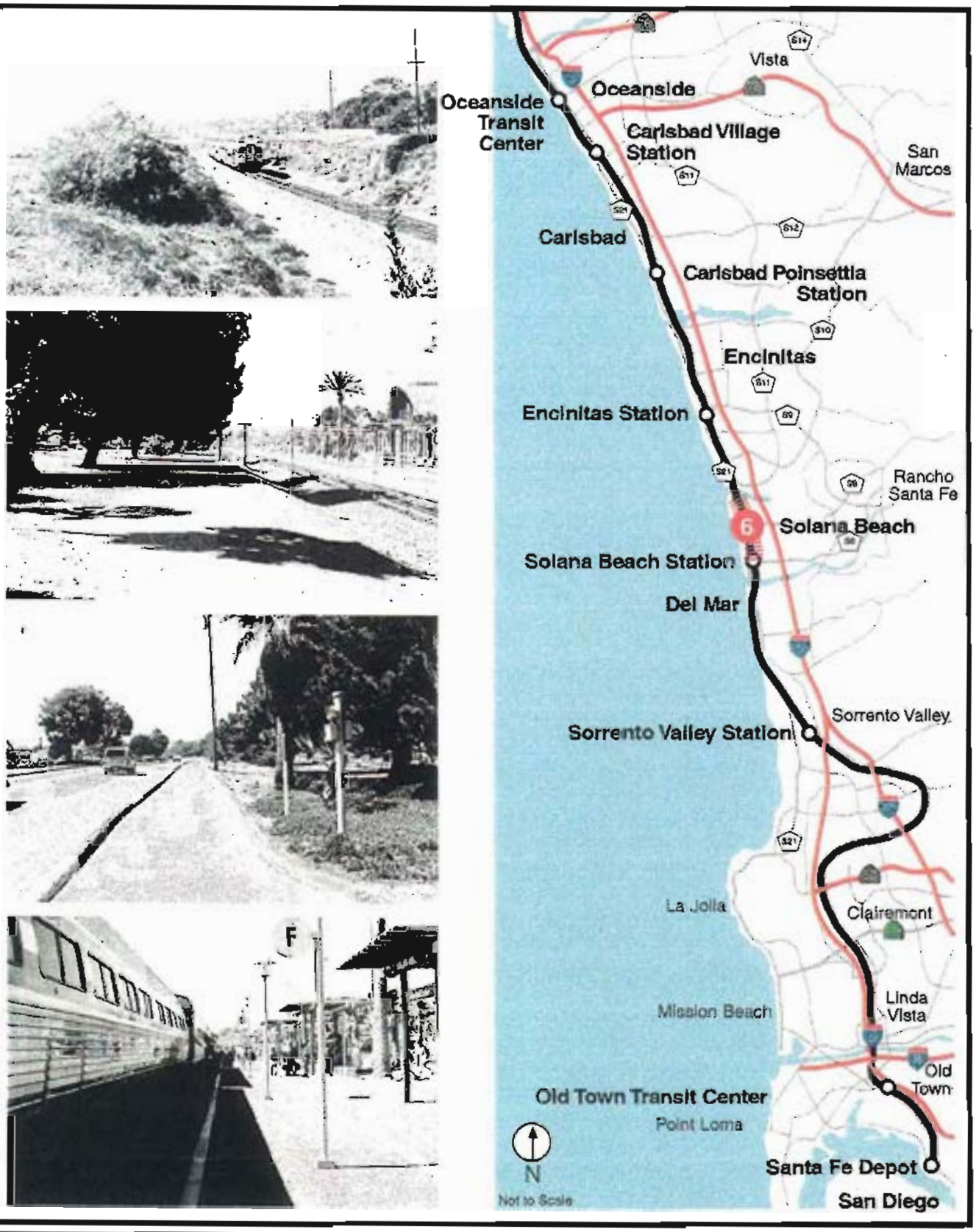


FIGURE 5.6	SEGMENT #6 SAN ELIJO LAGOON TO VIA DE LA VALLE	COASTAL RAIL TRAIL

5.7 Segment 7: City of Del Mar, Via de la Valle to Carmel Valley Road

The rail trail ends at the Via de la Valle intersection and proceeds south through the City of Del Mar along Camino del Mar on Class II bike lanes. The trail continues south along Camino del Mar through the retail district of Del Mar, using existing Class II bike lanes.

The City of Del Mar is separated from the ocean by the railroad tracks, which gradually climb the bluffs and literally sit on the edge of eroding cliffs above the beach. Due to concerns related to the stability of the bluffs, a City Council appointed trails committee recommended that the City Council adopt the street route for bicyclists and maintain the existing dirt trail along the bluffs for pedestrians.

The pedestrian trail proceeds along the railroad right-of-way at Power House Park, using the western side of the right-of-way. At the southern limits of Del Mar, the trail goes under the railroad connecting with an existing paved path at the Torrey Pines Preserve parking lot.

In order to provide safe public access to the beach, four at-pedestrian crossings are proposed by the City of Del Mar for the following locations: Torrey Pines, 8th Street, and 11th Street and 29th Street.

Table 12 Segment 7: Via de la Valle - Carmel Valley Road City of Del Mar	
Total Length - Class II - 2.7 miles (4.35 km) Pedestrian Path - 2.13 (3.42 km)	2.7 miles
ROW width	100'-200'
Arterial Grade Crossings (Jimmy Durante Road, Del Mar Heights Road, Via de la Valle)	3
Undercrossings	0
Bridges/ Overcrossings	0
Collector/Local Grade Crossings	7
At-grade pedestrian R/R crossings(Torrey Pines, 8th St, 11th St, and 29th St.	4

Major Destinations	
Recreational	Commuter
Torrey Pines State Beach	Del Mar City Hall and Library
Seagrove Park	Downtown Del Mar retail and commercial
San Dieguito River Park Coast to Crest Trail	Del Mar Racetrack and Fairgrounds
Del Mar Racetrack and Fairgrounds	

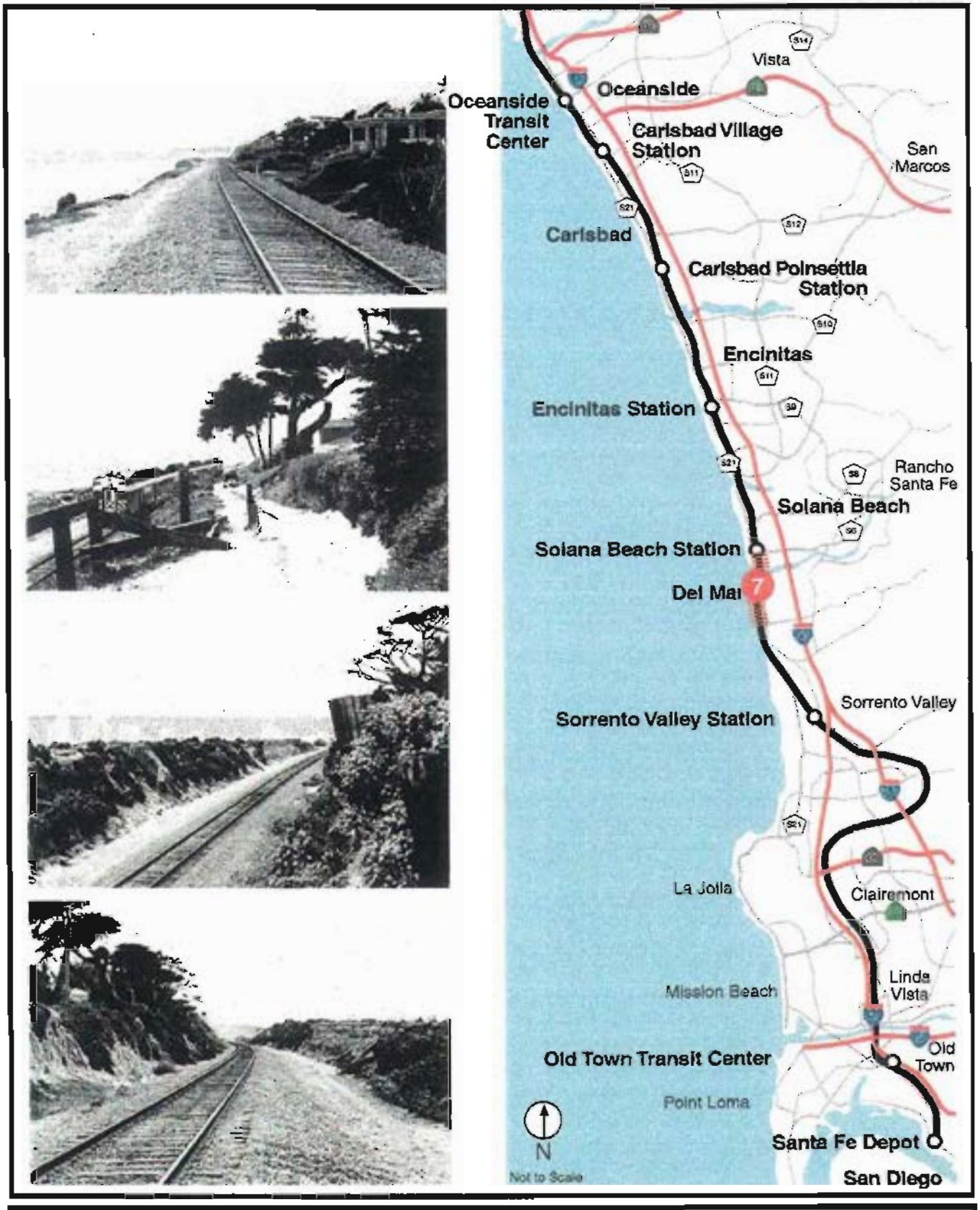


FIGURE 5.7	SEGMENT #7 VIA DE LA VALLE TO CARMEL VALLEY ROAD	COASTAL RAIL TRAIL

5.8 Segment 8: City of San Diego, Carmel Valley Road to Genesee Avenue

At Carmel Valley Road, the trail would utilize the bicycle lanes currently in the design phase by the City of San Diego. The City of San Diego is proposing a pedestrian trail along the south side of Carmel Valley Road as part of the Carmel Valley Road street improvement project.

At Sorrento Valley Road both cyclists and pedestrians would utilize a Class I bicycle path. The City of San Diego is considering closing this portion of the road for pedestrians and cyclists, which would connect to Carmel Mountain Road. Just past Carmel Mountain Road, the trail would access the railroad right-of-way and proceed behind the industrial area. The rail trail will pass along the Sorrento Valley Station on Sorrento Valley Road at I-5 and then access the railway right-of-way at the eastern edge.

The rail trail follows the railroad, along the existing SDNR service road. Due to the limited width of the right-of-way, a fence would be installed between the tracks and the trail. The trail may be reduced to the CalTrans minimum standard for a Class I trail of 8 feet through this section due to the constraints. The rail proceeds up a steep hill with an access road along the eastern edge. It is anticipated that this access road would accommodate a minimum width trail with fencing. NCTD is in the process of designing a second track from I805 to Miramar Road. It is recommended that the trail be developed in conjunction with the future realignment of the railway. The trail would cross under Miramar Road where a retaining wall is necessary between the bridge abutment and the slope. The trail then enters MCAS Miramar, crossing a Y-spur line on at-grade crossings. Through this open space area, the trail will follow the existing dirt access road located approximately 25 feet from the railroad. The trail would remain on the east side of the right-of-way though this corridor to I-805. MCAS recommends a fence be installed at the edge of the right-of-way to reduce encroachment on the military base.

At I-805, the trail crosses the railroad on a separate overcrossing to the north side of the railway. The south side of the railroad is Rose Canyon Open Space Park, a protected natural area that contains sensitive habitats such as Oak Woodland and riparian areas. The trail utilizes existing dirt trails on the north side of the railroad. At Genesee, the trail goes under the road following the railroad.

Table 13 **Segment 8: Carmel Valley Road** to Genesee Avenue **City of San Diego**	
Total Length - Class I - 9.4 miles (15.13 km) Class II - .7 miles (1.12 km)	10.6 miles (17.05 km)
ROW width	70-200'
Arterial Grade Crossings (Sorrento Valley Road/Roselle Street)	1
Undercrossings (Miramar road)	1
Bridges (North of Sorrento Valley Road., south of Sorrento Valley Road)	2
Overcrossings (I 805)	1
Collector/Local Grade Crossings (Del Mar Scenic Parkway, Via Aprilla, Via Grimaldi, Portofino Drive)	4
At-Grade Pedestrian R/R Crossings (MCAS spur lines)	2

Major Destinations	
Recreational	Commuter
Torrey Pines City Beach and Park	University of California, San Diego
Torrey Pines State Reserve and Beach	Sorrento Valley Station
	MCAS Miramar
	University Town Center (UTC)

FIGURE 5.8	SEGMENT #8 CARMEL VALLEY ROAD TO GENESEE AVENUE	COASTAL RAIL TRAIL

5.9 Segment 9: City of San Diego, Genesee Avenue to Balboa Avenue

The rail trail proceeds under Genesee Avenue, providing access to existing Class II bicycle lanes on Genesee Avenue . The rail trail will connect to the proposed Nobel Drive Coaster Station, thus increasing the potential commuter use of this particular trail segment.

The rail trail proceeds westerly and connects to an existing paved rail trail at Gilman Drive. The existing trail will be widened to 12' with striping and signing. Where the existing path ends at Santa Fe Street, the trail will utilize a Class III bicycle route along Santa Fe Street. Once past Santa Fe Street, the trail would access the western side of the alignment and proceed south. A flashing light and signs are recommended at the crossing at Santa Fe Street to alert motorists of bicycle cross-traffic. The trail proceeds south along the west side of the railroad, slowly progressing above the roadway to Balboa Avenue.

The trail would cross over Balboa Avenue on a separate bridge, due to the traffic volumes of over 51,000 ADT, grade difference, poor visibility, and road configuration which makes it very dangerous for a bicyclists to navigate this road segment.

Table 14
Segment 9: Genesee Avenue - Balboa Avenue
City of San Diego

Total Length - Class I - 3.57 miles (5.74 km) Class III - .45 miles (.73 km)	3.7 miles (5.95 km)
ROW width	100'-200'
Arterial Grade Crossings	0
Undercrossing	0
Bridges/Overcrossings (Balboa Avenue)	1
Collector/Local Grade Crossings (Santa Fe Street)	1
At-Grade pedestrian R/R Crossings	0

Major Destinations	
Recreational	Commuter
Marian Bear Park/San Clemente Canyon	University of California, San Diego, Torrey Pines High School
Rose Canyon Park	Multi-family residential communities
Soledad Natural Park	University Town Center and surrounding offices and commercial uses

FIGURE 5.9	SEGMENT #9 GENESEE AVENUE TO BALBOA AVENUE	COASTAL RAIL TRAIL

5.10 Segment 10: City of San Diego, Balboa Avenue to the Old Town Transit Center

This segment would begin at a new bridge over Balboa Avenue. Until the bridge is constructed, trail users could be directed to the Morena Boulevard crossing. Between Balboa Avenue and Clairemont Drive, the trail will be located on the west side of the tracks paralleling Morena Boulevard.

MTDB is proposing trolley service, which will require two additional light rail tracks and traction substations. In addition, NCTD proposes an additional track for Coaster services, known as the False Bay Siding Project. Coordination with MTDB and NCTD during final design will be essential to determine available right-of-way. The rail trail may utilize Class II bike lanes along Morena Boulevard, if the right-of-way becomes limited as a result of the increased rail services. The trail will divert to the east above Friars Road to Pacific Coast Highway Class II bicycle lanes.

Table 15
Segment 10 : Balboa Avenue to Old Town Transit Center
City of San Diego

Total Length - Class I - 3.13 miles (5.08 km) Class II - .53 miles (.85 km)	3.66 miles (5.9 km)
ROW width	70'-100'
Arterial Grade Crossings (Taylor Street, Clairmont Drive)	2
Undercrossings (Pacific Highway)	1
Bridges/Overcrossings	0
Collector/Local Grade Crossings	0
At-Grade Pedestrian R/R Crossings	0

Major Destinations	
Recreational	Commuter
Mission Bay Park	University of San Diego
Tecolote Canyon Natural Park	Old Town Transit Center
Mission Beach Boardwalk	Mission Valley Retail and Commercial areas
Old Town State Historical Park	

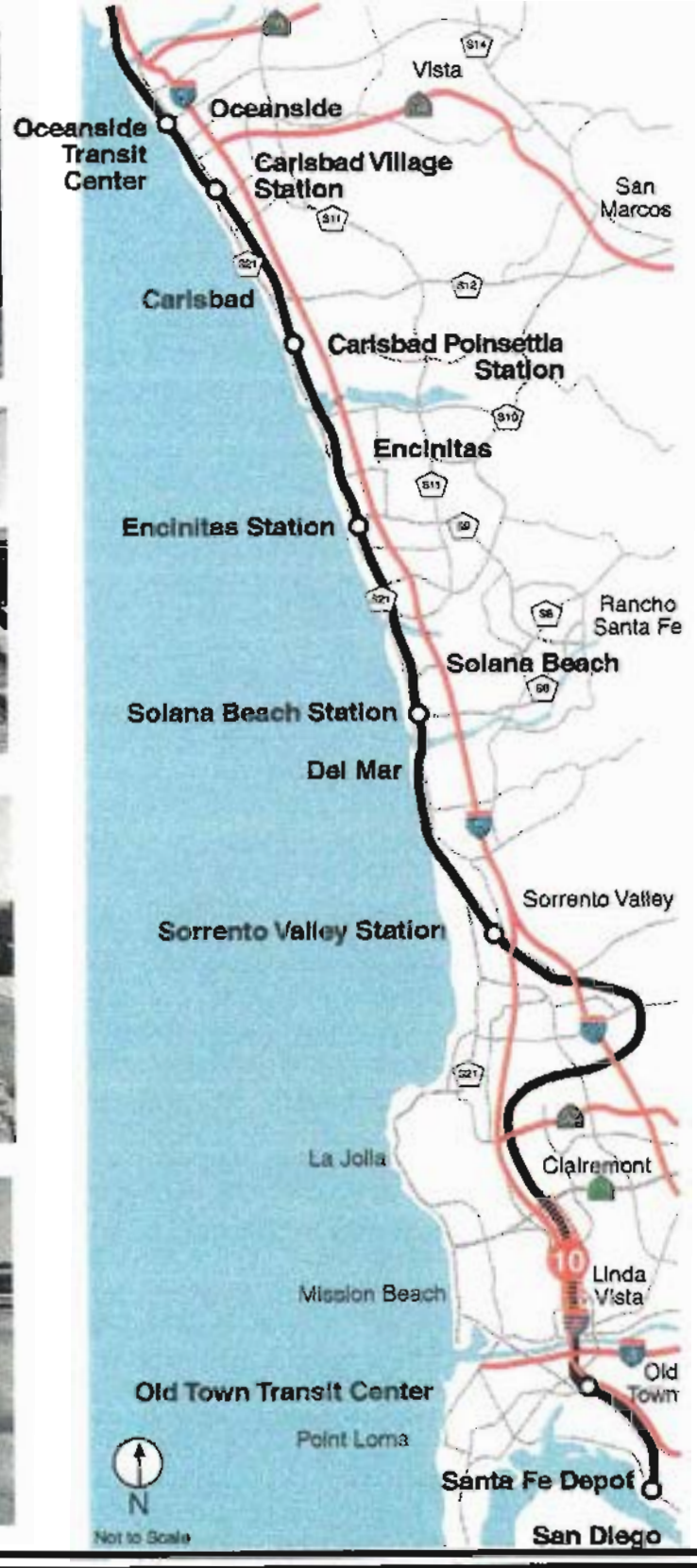


FIGURE 5.10	SEGMENT #10 BALBOA AVENUE TO OLD TOWN TRANSIT CENTER	COASTAL RAIL TRAIL

5.11 Segment 11: City of San Diego, Old Town Transit Center to the Santa Fe Depot

Due to the limited available right-of-way and high volume east-west traffic, the Coastal Rail Trail will continue along Pacific Highway utilizing the existing Class II bicycle lanes and terminate on the south end at the Santa Fe Depot in downtown San Diego. This is the logical terminus of the trail. Connections to the Old Town Transit Center will provide trolley service to east San Diego communities and Qualcomm Stadium. The Santa Fe Depot offers connections to the San Diego Civic Center, historic Gaslamp Quarter, the Children's Museum, and Tijuana, Mexico.

Table 16
Segment 11: Old Town Transit Center to the Santa Fe Depot
City of San Diego

Total Length: Class II - 3.65 miles (5.87 km)	3.65 miles
ROW width	70'-100'
Arterial Grade Crossings (Broadway, Grape, Ash, Laurel)	4
Undercrossings	0
Bridges/Overcrossings	0
Collector/Local Grade Crossings (Barnett Ave., Washington St., Palm St., Juniper St., Cedar St.)	5
At-Grade Pedestrian R/R Crossings	0

Major Destinations	
Recreational	Commuter
Maritime Museum/Waterfront	Downtown San Diego
Convention & Performing Arts Center	San Diego International Airport
Balboa Park and Zoo	U.S. Naval Supply Center
Horton Plaza/Downtown Shopping District, Gaslamp Quarter and theaters	County Administrative Center
Old Town State Historical Park	
Sports Arena	
Bayshore Bikeway	
Ferry Service to Coronado	

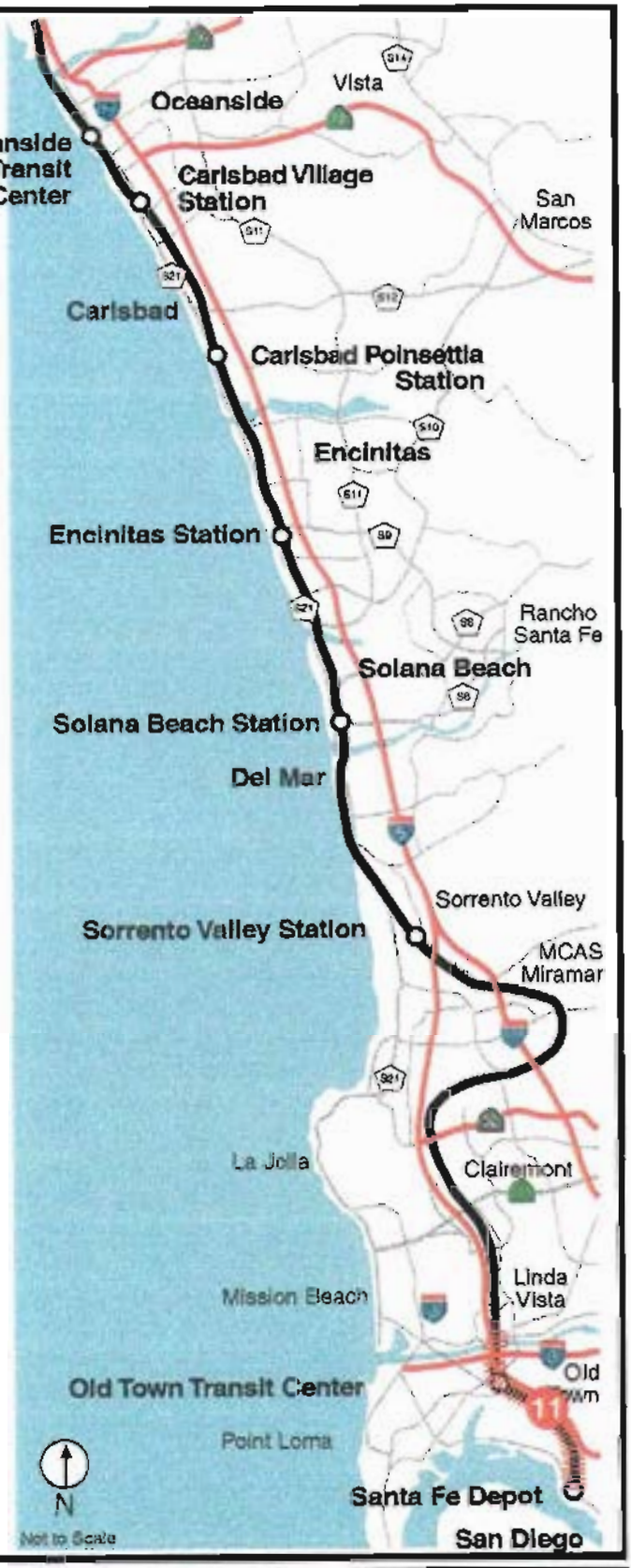


FIGURE 5.11	SEGMENT #11 OLD TOWN TRANSIT CENTER TO SANTA FE DEPOT	COASTAL RAIL TRAIL

5.12 Trail Alignment Summary

The advantages of the preferred route are the relative ease of implementation, lower traffic volumes along the Class I segments, limited impact on environmental resources, reasonable costs, and directness of route. The disadvantages include a lack of appeal for recreational users in areas where the trail utilizes the roadway.

Table 17
Trail Alignment Summary

	Oceanside	Carlsbad		Encinitas		Solana Beach		Del Mar		San Diego		
Segment	1	2	3	4	5	6	7	8	9	10	11	Total
Length Class I	2.05	1.80	3.68	2.65	1.58	1.56	2.7	9.4	3.57	3.13	0	32.12
Length Class II	.96	0	.40	.45	1.25	0	0	.7	0	.53	3.65	7.94
Length Class III	.35	.36	0	0	.29	0	2.13	0	.45	0	0	3.58
Arterial Grade Crossings	2	1	2	3	1	2	3	1	0	2	4	20
Road Undercrossings	1	1	1	0	0	0	0	1	0	1	0	7
Bridges/ Overcrossings	0	1	1	0	0	2	0	2	1	0	0	13
Collector/ local Grade crossings	6	3	0	0	2	0	3	4	1	0	5	26
At-grade ped R/R crossings	0	1	0	3	4	0	4	2	0	0	0	13

6.0 Trail Design

6.1 Planning and Design Standards

This chapter provides specific design and implementation guidelines and standards to ensure that the Coastal Rail Trail is consistently constructed to the highest and best standards currently available in the United States. Planning, design, and implementation standards are derived from the following sources:

CalTrans: "Highway Design Manual" (Chapter 1000: Bikeway Planning and Design)
American Association of State Highway and Transportation Officials (AASHTO): "Policy on Geometric Design of Highways and Streets"
State of Florida: Florida Bicycle Facilities Planning and Design Manual (1996)
CalTrans: Manual of Uniform Traffic Control Devices (MUTCD)
USDOT, FHWA: "Selecting Roadway Design Treatments to Accommodate Bicycles"
Bicycle Federation of America (BFA): "Selecting and Designing Bicycle Routes"
USDOT/FHWA: Conflicts on Multiple-Use Trails
Institute of Traffic Engineers (ITE): "Design and Safety of Pedestrian Facilities"
Rails to Trails Conservancy (RTC): Rails-with-Trails, Sharing Corridors for Transportation and Recreation

It is useful to note that while there are a considerable number of trails on active railroads around the United States, there are few design guidelines that have been developed specifically for this type of facility. The sources listed above provide details on many aspects of a rail trail, but a) may contain recommendations that conflict with each other, b) are not, in most cases, officially recognized 'requirements,' and c) do not cover all of the conditions on most rail trails. Except for the CalTrans guidelines, all design guidelines must be considered as simply design resources for the Coastal Rail Trail, to be supplemented by the reasonable judgement of the trail designer and trail manager.

In addition to the published resources listed above, the trail design reflects recommendations from active rail trail managers around California and the United States. Unfortunately, there are few rail trails around the country, which reflect the similar characteristics of the Coastal Rail Trail corridor in terms of grade crossings, fencing, setbacks, speed of trains, train frequency and draw of users to the beach. Currently a committee has been formed at the Federal Railroad Administration to review and establish a set of standards for rail trails nationwide.

Until CalTrans or the Federal Highways Administration adopts specific standards for rail trails, the CalTrans basic design parameters will be used. Mandatory standards are shown in bold face. Advisory standards are important but allow for greater flexibility and are identified by the word 'should.' Permissive standards are identified by the words 'should' or 'may', and can be applied at the discretion of the project engineer. Controlling Criteria, as defined by the FHWA, consists of 13 specific criteria to be used in the selection of design standards. They are: (1) design speed, (2) lane width, (3) shoulder width, (4) bridge width, (5) horizontal alignment, (6) vertical

alignment, (7) grade, (8) stopping sight distance, (9) cross slope, (10) super elevation, (11) horizontal clearance, (12) vertical clearance, and (13) bridge structural capacity.

Designs which deviate from the mandatory CalTrans design standards **shall** be approved by the Chief Office of Project Planning and Design, or by delegated Project Managers. These standards represent the basic guidelines set fourth by CalTrans. There are many conditions, which are not explicitly covered in the CalTrans or AASHTO guidelines. These may be site specific, user specific, or policy specific.

6.2 Trail Design - Class I

Recommended Width

The recommended minimum width for paved multi-use trails in California is 8-feet, with 2-feet of lateral clearance and 8-feet of vertical clearance. The minimum standards for a Class I rail trail are reflected in Figure 6.1. The rail trail is projected to have higher volumes of bicyclists and other users, and may accommodate maintenance vehicles on a regular basis for both the railroad and the trail. The following are the recommended design dimensions: 1) 12-feet width with the same lateral and vertical clearances, (2) 2' wide unpaved shoulders, with a compacted surface, on each side of the paved surface to accommodate joggers and others who prefer a softer surface, and (3) a 2% cross slope for drainage. The recommended Class I rail trail is shown in Figure 6.2.

Signing and Striping

A yellow centerline stripe may be desirable, but is not required on sections of the trail that have heavy usage, curves with restricted sight lines, at approaches to intersections, and/or where nighttime riding is expected. Signing of the trail is addressed in Chapter 7.0.

Intersections and Crossings

The trail alignment should take into consideration the frequency and conditions of grade crossings at roadways. Grade separations, such as bridges or undercrossings, are recommended if traffic volumes are heavy. If grade separation is not feasible, traffic signals may suffice. Stop or yield signs for bicyclists are acceptable where traffic volumes are not heavy.

Trail crossings should occur at established pedestrian crossings wherever possible. Mid-block crossings should address right-of-way for the motorist and trail user through use of yield, stop, or traffic signals that can be activated by trail users. Trail approaches at intersections should always have stop or yield signs to minimize conflicts with autos. Ramps should be placed on sidewalk curbs for bicyclists.

Separation of Pathways

The CPUC has specific minimum setbacks from any sidewalk or trail that parallels active railroad tracks. These standards are typically applied to the minimum distance that crossing guard equipment is located from tracks. Minimum distances from the centerline of an active railroad to the outside edge of a trail or bikeway is 8'6" on tangent and 9'6" on curved track as shown in Figure 6.1. Wherever possible, it is recommended that the trail be set back at least 25 feet from the centerline of the tracks, or at least 15 feet when there is a vertical separation of more than 10 feet (see Figure 6.2).

Design Speed

The minimum design speed for bike paths is 20 miles per hour, except on sections where there are long downgrades (steeper than 4%, and longer than 500-feet). **Speed bumps or other surface irregularities should never be used to slow bicycles.**

Horizontal Alignment

Recommended radius for a curve and elevation are reflected in CalTrans Standards Specifications in Appendix I. A 2% cross slope is recommended for drainage.

Stopping Sight Distances and Crest Vertical Curves

Recommended stopping sight distances reflected in the CalTrans Standards Specifications (see Appendix I) should be applied to the downgrade portion of any two-way trail. The recommended length of crest of vertical curves is also shown.

Lateral Clearance on Horizontal Curves

The minimum clearance to line of sight obstructions on horizontal curves can be calculated by taking the lateral clearance information from the CalTrans Standards Specifications, required stopping sight distance, and the proposed horizontal curve radius.

Gradients

Steep grades should be avoided on any bike path or multi-use trail. A 5% maximum gradient is recommended. Steeper grades can be tolerated for short distances (up to about 500 feet), but must also meet ADA requirements.

Structural Section

Bike path construction should be conducted in a similar manner as roadway construction, with sub-base thickness to be determined by soils condition and expansive soil types requiring special structural sections. Minimum asphalt thickness should be 2" of Type A or Type B, with ½"

maximum aggregate and medium grading as described in CalTrans Standard Specifications in Appendix I.

Drainage

The 2% cross slope will resolve most drainage issues on a bike path, except along cut sections where uphill water must be collected in a ditch and directed to a catch basin.

Barrier Posts

Posts or bollards at trail intersections and entrances may be necessary to keep vehicles from entering. Posts should be designed to be visible to bicyclists and others, especially at night, with reflective materials and appropriate striping. Posts should be designed in such a way that they are moveable by emergency vehicles.

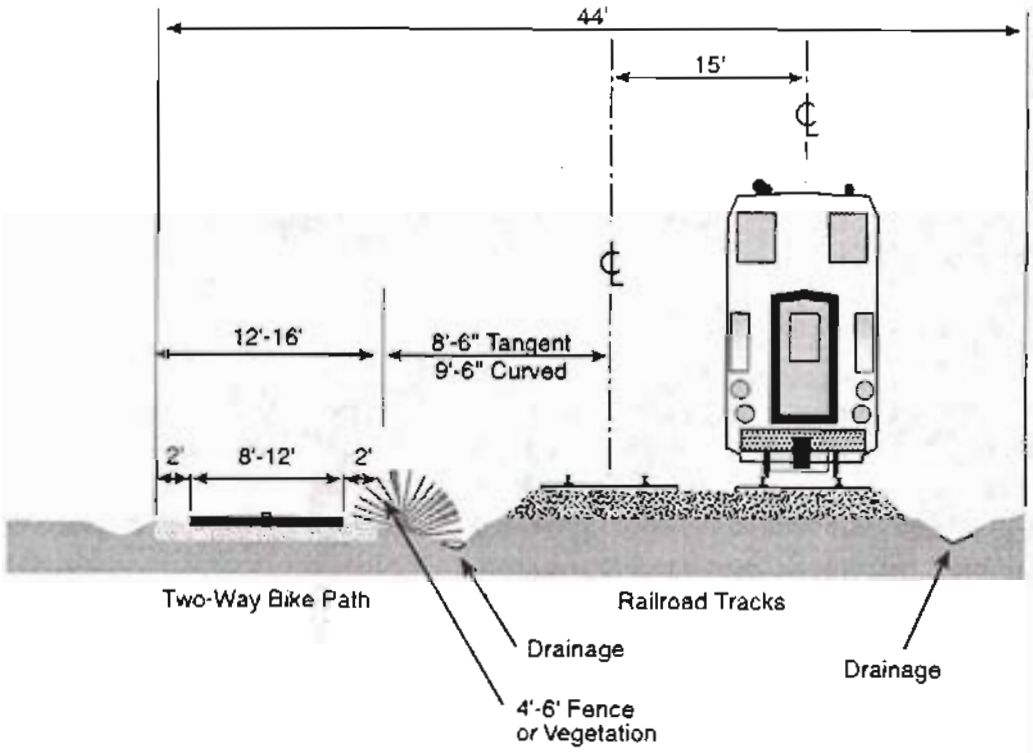
Street Lights

Streetlights may be desirable in specific locations. Possible locations are: where night use is expected or encouraged, at intersections, where they may be warranted to ensure safety or to provide accent in a park like setting.

Flashing Lights

Due to the quietness of newer passenger trains, it may be worthwhile to install flashing lights along the trail which indicate a train is approaching. This may reduce the amount of hornblowing to alert trail users of an oncoming train. The flashing lights may be especially useful in areas where there is limited right-of-way width, high volumes of users, and/or no physical barrier present.

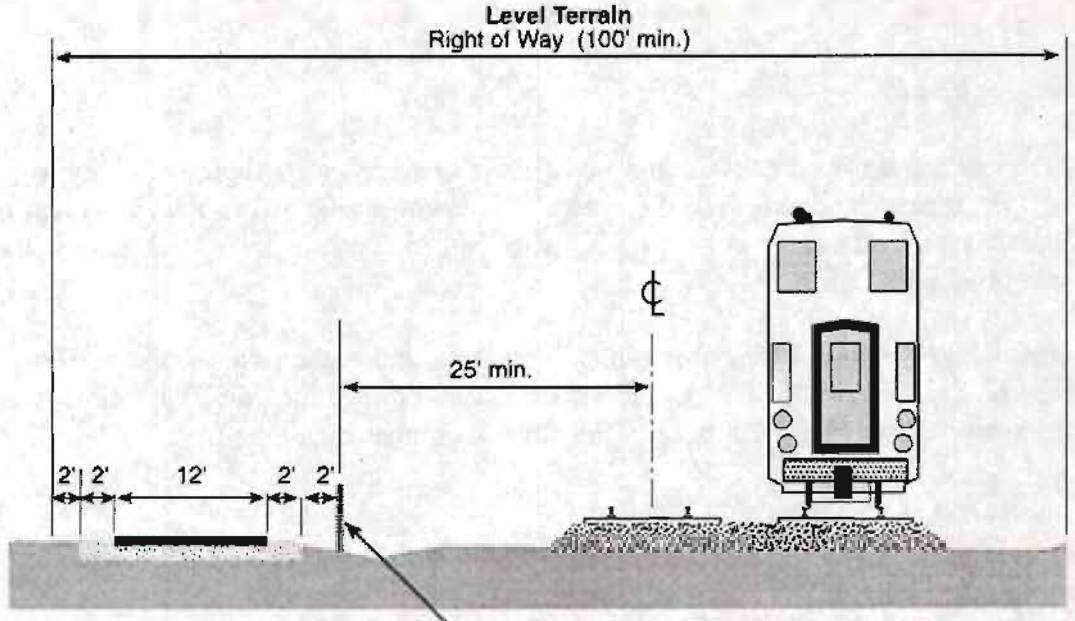
Double Track Right of Way with Bikeway
Minimum PUC and Caltrans Dimensions



Caltrans Standard for Class I Bikepath

CPUC Standard for minimum distance from railroad

FIGURE 6.1	CLASS I RAIL / TRAIL (MINIMUM STANDARDS)	COASTAL RAIL TRAIL



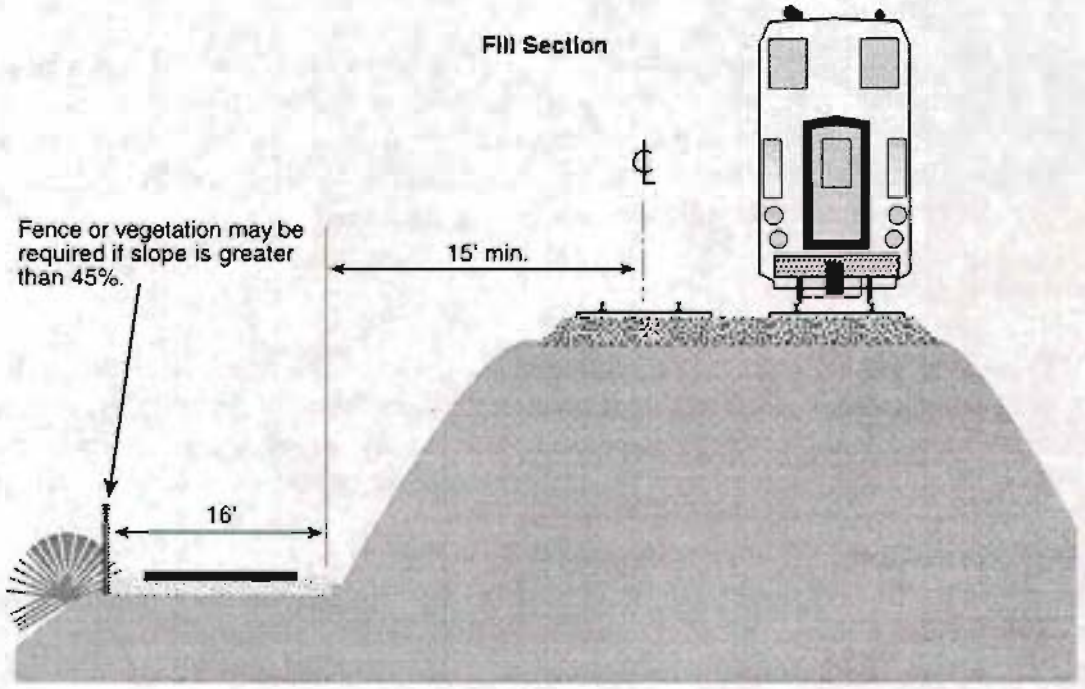


FIGURE 6.2	RECOMMENDED CLASS I RAIL TRAIL	COASTAL RAIL TRAIL

Bikeways and Railroads

Bikeway crossings at railroad tracks should be at least as wide as the approach bikeway, and should be at right angles (90 degrees) to the tracks. Pavement should be maintained so that ridge buildup adjacent to the tracks does not occur, with timber plank or other enhanced surfaces installed when possible.

The California Public Utilities Commission (CPUC) regulates railroad crossings. All new at-grade crossings must be approved by the CPUC. Necessary railroad protection will be determined based on a joint field review involving the applicant, the railroad company, and the CPUC.

Signing, Markings, and Traffic Control Devices

Uniform signs, markings, and traffic control devices shall be used per section 2376 of the Streets and Highways Code. An optional 4" yellow centerline stripe may be used to separate users on a Class I bike path. **Bike lane signs (R81) shall be placed at the beginning of all bike lanes, on the far side of every arterial street intersection, at all major changes in direction, and at maximum half-mile intervals. Bike lane pavement markings shall be placed on the far side of each intersection.**

Bike path, bike lane, and bike route signing and markings should follow the guidelines as developed by CalTrans and presented in the Manual on Uniform Traffic Control Devices. This includes advisory, warning, directional, and informational signs for bicyclists, pedestrians, and motorists. The final striping, marking, and signing plan for the Coastal Rail Trail should be reviewed and approved by a licensed traffic engineer or civil engineer.

6.3 Constrained Cross Section

The major design objective of the Coastal Rail Trail is to locate the trail within the existing railroad right-of-way. The railroad right-of-way generally ranges from 100 to 200 feet, although the effective or available width may be considerably less. For example, through wetlands or areas of rugged topography, the railway tracks are often on narrow fill or cut sections, or on bridges, leaving little space for a maintenance road or the rail trail.

Excess right-of-way for the trail is constrained in many locations by terrain, wetlands, waterways and bridges, utility poles, signal equipment, sub-surface utilities, drainage ditches, buildings, transit lines, and existing or future railroad sidings. The selection of the alignment reflects these constraints, with the result that in some locations the rail trail may be reduced in width or relocated from the railroad right-of-way to existing bike lanes adjacent to roadways. A constrained cross section has been developed, where it may be preferable to keep the rail trail within the railroad right-of-way, rather than re-route the trail onto adjacent roads. The conditions under which a constrained cross-section should be used are described below:

- Alternate routes have been studied and are not acceptable because of functional or safety reasons;
- The constrained section is for a relatively short distance, generally less than 500 feet;
- Trail volumes are not projected to be above average;
- Hazards are clearly marked;
- Trail speed limits are 10 miles per hour; and
- Bicyclists are required to dismount when appropriate.

The minimum width for a constrained section is six (6) feet, with at least one (1) foot of lateral clearance and eight (8) feet of vertical clearance. All other standards identified by CalTrans Standard Specifications should be met.

6.4 Overcrossings /Undercrossings

Bridges

A key factor in selecting the preferred rail trail alignment was to minimize the number of bridges across lagoons or wetlands that would need to be constructed, due primarily to the cost constraints and availability of funding, but also due the potential environmental impact on lagoon or riparian habitat. Wherever possible, the trail utilizes existing roadway bridges thus eliminating major expense associated with bridge construction. Aside from numerous minor crossings of culverts and minor waterways, there are several major bridges that are included as part of the preferred alignment. These structures are listed below in Table 17.

Table 18
Proposed Coastal Rail Trail Bridges

Location	Type
Agua Hedionda Lagoon	Trail bridge constructed on top of existing sewer main. (see Section 5.2)
I-805	Overcrossing from south side to north side (see Section 5.8)
Balboa Avenue	Trail bridge over Balboa Avenue (see Section 5.9)

In addition to these structures, other existing roadway bridges may need widening to accommodate bike lanes or a bridge attachment may be used. Lateral access points along the rail trail may be either on bridges, undercrossings, or possibly at-grade. The need for lateral access points to the rail trail and across the adjacent railway tracks to supplement existing roadway grade crossings has been identified for Carlsbad, Del Mar, Encinitas, Solana Beach, and San Diego. The exact location, type, and number of these crossings will be the subject of evaluation during design and CPUC approval.

The railroad corridor north of San Diego includes several long fill sections through wetlands coupled with long trestles or bridges over the saltwater lagoons. The profile of the fill sections

and presence of adjacent wetlands makes locating the Coastal Rail Trail problematic in these areas, hence the relocation of the rail trail to nearby roadways.

All new bridges should provide a clear 8-foot wide trail, with CalTrans approved railings. The structural load bearing capacity of bridges should meet or exceed CalTrans standards, and be able to support emergency vehicles.

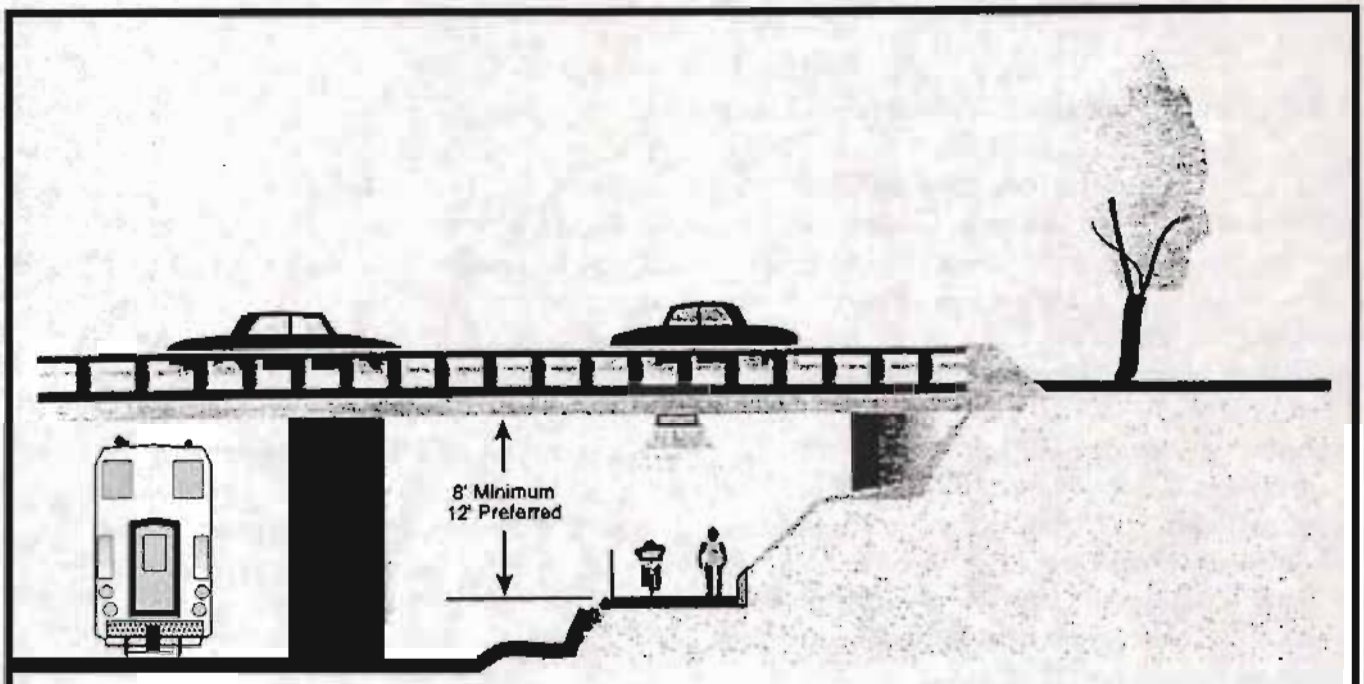
Bridges may have to meet special requirements such as staging, material types, and specifications when crossing CalTrans or railroad facilities. All bridges must meet ADA requirements for a maximum 5% gradient, which results in long approaches to the overcrossing.

Most recreational bike path bridges in California are pre-fabricated steel structures, with single spans in excess of 300 feet. Cast-in-place concrete bridges may prove to be a better solution when subject to salt-water corrosion.

Undercrossings

No new undercrossings have been identified for the Coastal Rail Trail, other than at locations where the trail will pass under an elevated rail or roadway overcrossing. It may prove to be more cost effective to tunnel under the railroad where the trail is below the track level, rather than bridge the railway tracks. A new technology has been developed that allows pre-fab casings to be put in place while the railway tracks are being used, thereby eliminating the need to close the railway tracks to excavate the under crossing. This technology may have applications at new lateral access points along the Coastal Rail Trail.

Undercrossings under existing roadways or rail in excess of 50 feet should be well lit and be visible for the entire length by bicyclists entering one end. Figure 6.3 graphically describes typical undercrossing issues and requirements.



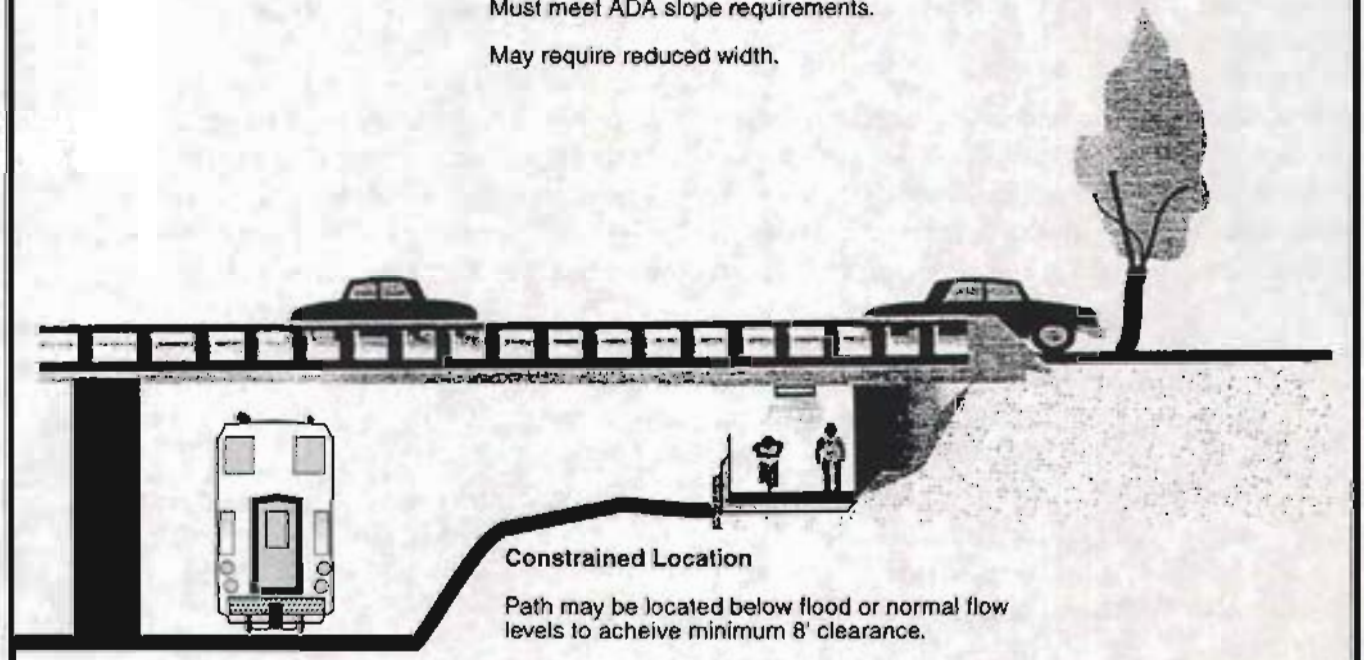
Typical Cross Section

Lighting / security needed for undercrossings over 40' length.

Must be designed to support bulldozer to clear silt.

Must meet ADA slope requirements.

May require reduced width.



Constrained Location

Path may be located below flood or normal flow levels to acheive minimum 8' clearance.

Design should allow for clearing by bulldozer.

FIGURE 6.3	ROADWAY UNDERCROSSINGS	COASTAL RAIL TRAIL

6.5 Fencing and Other Barriers for Class I

Where the trail is located in close proximity to the railroad tracks (15' or less from the outside edge of the tracks) a barrier or fence is necessary to provide a safe separation between the trail and the tracks. Fencing, vegetation, and other barriers may be used to separate a rail trail from adjacent active railroads on one side and/or from adjacent land uses on the other side. MCAS Miramar has requested that a fence be installed on both sides of the right-of-way to ensure protection of environmental resources and restrict base access.

Barriers between the trail and railway tracks have been the subject of a study conducted by the Rails-to-Trails Conservancy (RTC). Of the 37 trails-with-rails in the United States surveyed by RTC in 1996, 11 (30%) of the trains operate at speeds of 40 miles per hour or greater. The SDNR right-of-way operates 43 trains daily at speeds up to 90 miles per hour. The median distance (of all rail trails) from the edge of the trail to the centerline of the nearest railroad track was 55 feet, although 36% of the trails were located within 20 feet of the centerline of the railway tracks.

Of all rail trails, the majority (70%) had a barrier separating the railway tracks and trail, with the most common types of barriers being vegetation (32%), vertical separation (27%), and fencing (21%). Although the trails surveyed do not reflect the speed or frequency rates of the SDNR corridor, the survey is valuable when identifying the success of rail trail projects, design standards, and usage patterns.

FHWA is currently conducting a thorough survey of other rails with trails. Rail trails across the nation are being surveyed to find out how various issues have or have not been addressed. The study is due to be released in late 2001. The purpose of the study is to determine if standards should be developed which meet the needs of the railroad operators, the Public Utilities Commission, Federal Railroad Administration, and others. Some of the major issues include:

a. *Existing Conditions*: Railroads are seldom fenced through urban or suburban areas in California. Vegetation, fencing, or other barriers are typically not provided where a railroad is directly adjacent to a roadway with sidewalks.

b. *Parallel Movement:* Typically pedestrians, bicyclists, and others are not permitted on the railroad right-of-way, although there has been historic public use of railroad right-of-ways. Most people walking or riding on railroad right-of-ways are usually not on the railroad tracks themselves unless there is no other viable place to walk.

c. *Lateral movement:* There is considerable lateral movement across railroad tracks in most communities, and even more so along the Coastal Rail Trail due to the location of the railroad tracks between beaches and residential neighborhoods. This lateral movement, while considered trespassing, is a historic pattern in many communities.

d. *Right of Access*: Related to lateral movement is the fact that any attempt to prevent informal crossings of railroad railway tracks using fencing or other materials may result in

protests from local groups such as the Surfriders Association, California Coastal Commission and other public and private organizations.

e. *Environmental Impact:* Extensive fencing or other structural barrier would inhibit wildlife that currently migrates across the corridor, especially in the Rose Canyon Open Space Park and MCAS Miramar.

f. *Vandalism:* Fencing or other structural barriers that are constructed to prevent historic pedestrian patterns are typically repeatedly vandalized, including cutting holes in, pulling down, or jumping over fencing.

g. *Cost:* Fencing and other structural barriers, depending on the type of materials used, height, and length, can be one of the most expensive features of a rail trail, and may, in some circumstances, impact the overall project feasibility.

h. *Aesthetics:* Depending on the type and height of the barrier, the aesthetics of a Coastal Rail Trail could be impacted by eliminating or reducing views and otherwise creating a 'bowling alley' effect for trail users. Structural barrier materials should contribute to rather than detract from the overall community aesthetics. Choices on barrier type and height could impact the overall attractiveness of the facility. Shrubs may provide a solid barrier while reducing visual impacts of a fence or wall.

I. *Safety:* The majority of existing rail-trails have some type of barrier between the trail and railway tracks. It is reasonable to assume that the safety record is related somewhat to the presence of barriers in some circumstances. Those circumstances are assumed to be where the trail is located in close proximity to an active mainline or where there is heavy lateral movement across the railway tracks.

j. *Security:* Vegetation or fencing barriers between the trail and adjacent land uses can protect the privacy and security of the property owners. While crime or vandalism has not proven to be a common problem along most multi-use trails, fencing in this instance is still considered a prudent feature. The type, height, and responsibility of the barrier are dependent on local policies.

k. *Barrier height:* The height and design of the vegetation or fence influences whether lateral movement will be inhibited. Barriers that cannot be climbed will typically be cut or otherwise vandalized. Heavy-duty fencing such as wrought iron or other styles of fencing that are difficult to climb may be cost prohibitive. If people are given the opportunity to cross at a new crossing within 250 feet in either direction, the desire to climb over the fence or barrier is reduced.

l. *Noise and wind:* Due to high speeds of the Coaster and other trains, noise, wind, dust, vibration, and the sheer surprise of an 90-mph train to a trail user located in close proximity to the railway tracks may be overwhelming. A vegetated or solid barrier will reduce the effects of noise and wind.

Based on these issues and available research, the following recommendations regarding barriers on the Coastal Rail Trail have been proposed, subject to revision by the individual jurisdictions and a proposed statewide reviewing panel:

a. Vegetation and/or other physical barriers shall be installed where the rail trail is located closer than 25 feet from the edge of the trail to the centerline of the closest track; where the vertical separation is 10 feet or less; and where there are no existing physical barriers such as drainage ditches.

b. Vegetation and/or other physical barriers shall be installed where there is observed lateral crossings by pedestrians and others. Where fencing is installed for this purpose, new crossings shall be installed no less than every 500 feet. New crossings may be bridges, undercrossings, or at-grade crossings.

c. Vegetation and/or other physical barriers shall provide breaks or openings at least 5 feet wide every 500 feet.

d. Vegetation and/or other physical barrier height may range between 36 inches and 72 inches although the recommended height is between 36 inches and 48 inches. Where the edge of the trail is located closer than 15 feet from the centerline of the nearest track, and the vertical separation is less than 10 feet, the barrier shall be at least 60 inches high with appropriate baffling material. Baffling material includes vegetation such as ivy or other vines, or a solid material, such as wood.

e. Other barrier types such as vegetation, ditches, or berms may be used where the edge of the trail is located further than 25 feet from the centerline of the closest track, or where the vertical separation is greater than 10 feet. Recommended vegetation types should be low water, low-maintenance, such as pyracanthea (see Chapter 8.0). Ditch or berm gradients should not exceed 2:1 slopes or be greater than 10 feet in depth or height.

6.6 Trail Design - Class II Bike Lanes and Class III Bike Routes

Portions of the proposed Coastal Rail Trail will be located on local surface streets and classified as either bike lanes or bike routes. Standards for Class II bike lanes and Class III bike routes are presented below, with mandatory standards in bold type and are reflected in the CalTrans Standard Specifications in Appendix I.

a. **Bike lanes shall be one-way facilities, and located on both sides of two-way streets.**
b. **Bike lanes shall be 5-feet wide when adjacent to on street parking or a minimum of 4-feet wide if there is no on street parking. One (1) feet of the gutter pan may be included in the 4-feet. Combination parking/bike lanes may be used that have one outside stripe and are 11 or 12-feet wide, depending on the type of curb.**
c. **All striping should be continuous 6" solid white, except for the line between the lane and parking, which may be 4" solid white.**

d. **Bike lanes shall not be placed between the parking area and curb.**

e. **Bike lanes shall be striped next to curbs where parking is prohibited during certain hours only in conjunction with special signing.**

f. Typical vehicle lanes next to a bike lane are 12-feet wide, with 11-feet acceptable where favorable conditions exist.

g. **Raised barriers such as curbs shall not be used to delineate bike lanes.**

h. Intersection design should be accomplished according to the designs presented in Figure 6.4.

i. Class III bike routes are unstriped shared facilities with motorists or pedestrians that should provide continuity to the bikeway system, and provide the bicyclist with a higher degree of service than alternative routes. A higher degree of service includes directness, adjusted traffic control devices giving priority to bicyclists, removal of on street parking when possible, surface imperfections corrected, and/or a higher standard of maintenance than other comparable routes.

j. Sidewalks should generally not be used as a bike route, except under special circumstances.

k. **Bikeways or trails parallel to roadways should be located no closer than 5-feet from the edge of the roadway, unless a physical barrier is provided.** Generally, bikeways are not recommended directly parallel to roadways as most bicyclists will find it less usable than the street itself, assuming there is adequate width on the street.

Bridge and Grate Standards

Bicycles on bridges are best accommodated by bike lanes. Bikeway approaches to a two-way bikeway on one side of a bridge should be by way of a two-way bike path (not bike lane). **A physical separation (such as a fence or railing) shall be provided between a two-way bike path directly adjacent to travel lanes on a bridge (see Figure 6.11). Separate highway overcrossing structures for bicycles should conform to CalTrans' standard design loading of 85 pounds per square foot, with the minimum clear width the same as the approach bikeway. Drainage inlet grates on bikeways shall have openings narrow enough and short enough to assure bicycle tires will not drop into the grates.**

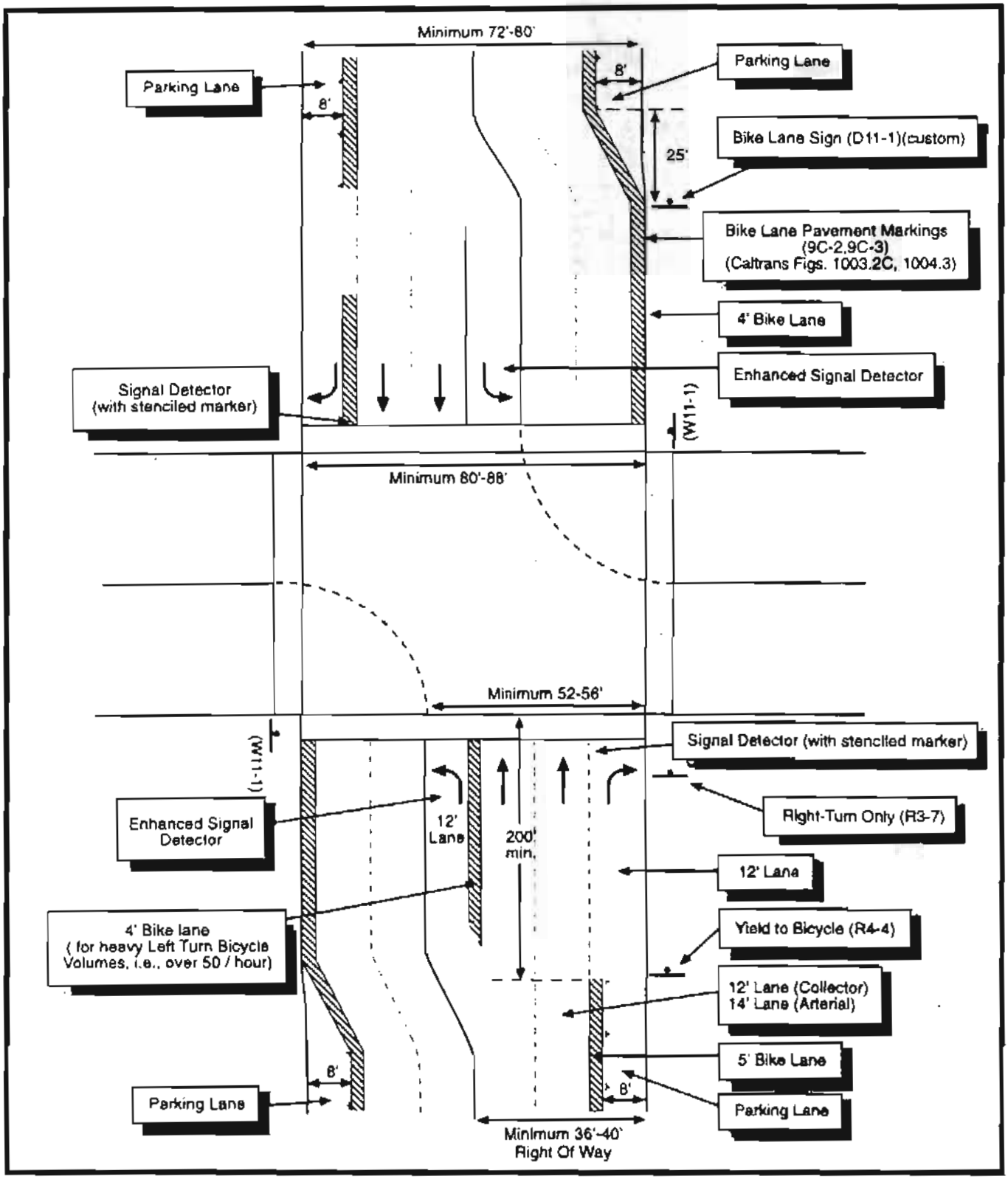


FIGURE 6.4	CLASS II BIKE LANES AT ARTERIAL INTERSECTIONS (RECOMMENDED)	COASTAL RAIL TRAIL

6.7 Roadway Grade Crossings

One of the major criteria used to select the preferred alignment was the reduction or elimination of rail or roadway crossings. Currently a bicyclist riding along the entire 44-mile Coastal Rail Trail corridor would have to ride on major arterials and highways, and cross over 150 streets including many high traffic arterials. The proposed trail will reduce the number of crossings to 39. Many of these crossings occur along the Class II bike lanes and not along the Coastal Rail Trail Class I path. As most bicycle and pedestrian-related accidents occur at intersections, this reduction in crossings and conflicts represents one of the significant benefits of the Coastal Rail Trail.

This is not to imply that the proposed rail trail crossings will eliminate bicycle and pedestrian-related accidents. Grade crossings represent one of the key obstacles to trail implementation. Motorists are often not expecting to see bicyclists and pedestrians at unprotected locations or at railroad crossings. However, based on the more than 60 active rail trails around the United States, all of which have at-grade crossings, safety has generally not been a problem.

When considering a proposed separated bike path and required crossings of roadways, it is important to remember two items: (1) trail users will be enjoying an auto-free experience and may enter into an intersection unexpectedly, and (2) motorists will not expect to see bicyclists entering from an unmarked intersection into the roadway. In most cases, bikeway roadway crossings can be properly designed to a reasonable degree of safety.

The final design of a trail will consider vehicle traffic patterns, traffic speeds, street width, traffic volumes (average daily traffic, and peak hour), line of sight, and trail user profile (age distribution, destinations) to determine appropriate design measures. When the Coastal Rail Trail accesses adjacent roadways, it will generally utilize existing Class II bike lanes along Coast Highway (Highway 101).

The proposed systems approach in this report is based on established standards, published technical reports, and the experiences documented on existing facilities. Virtually all roadway crossings fit into one of four basic categories, described below:

Unprotected Roadway Crossings (Type 1)

An unprotected roadway crossing consists of a crosswalk, signing, and often no other devices to slow or stop traffic (see Figures 6.5 and 6.6). The approach to designing roadway crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, trail traffic, use patterns, road type and width, and other safety issues such as the location of nearby schools. The table below identifies the general thresholds below which unprotected roadway crossings may be acceptable.

Table 19 Unprotected Roadway Crossings	
Install Crosswalks	All locations[27]
Maximum Traffic Volumes:	10,000-15,000 (ADT), 1,000-1,500 peak hour
Maximum 85th Percentile Speeds:	35-45 mph
Maximum Trail User Volumes:	50-75 per hour, 300-400 per day
Maximum Street Width	60 feet (no median)
Minimum Line of Sight	25mph zone: 100 feet 35mph zone: 200 feet 45mph zone: 300 feet

On residential and collector streets below 10,000 ADT, crosswalks and warning signs ('Bike Xing') should be provided for motorists, and STOP signs and slowing techniques (bollards/geometry) used on the trail approach. Care should be taken to keep vegetation and other obstacles out of the sight line for motorists and trail users.

Collector streets up to 15,000 ADT require a higher level of treatment for roadway crossings than residential streets. In addition to the features described for residential streets, signing locations may need to be moved towards oncoming traffic and made more visible for motorists. A flashing yellow beacon (costing between $15,000 and $30,000) may be used, preferably one that is activated by the trail user rather than one that is continuously flashing. The East Bay Regional Park District in Northern California is successfully using a flashing beacon that is activated by motion detectors on the trail, triggering the beacon as trail users approach the intersection. This equipment, while slightly more expensive, helps to keep motorists alert.

Higher volume arterials (over 15,000 ADT) may be unprotected in some circumstances, for example if they are located near a signalized intersection and there are substantial 'gaps' in the traffic, and/or there is a median island. This would not be appropriate if there were a significant number of children using the trail.

Roadway Crossings (Type 2)

Bike paths which either parallel a roadway or emerge closer than 200 to 250 feet from a protected intersection, should be routed to that crossing in most cases (see Figure 6.7). The reason is that motorists are not expecting to see pedestrians and bicyclists crossing so close to an intersection; traffic congestion may extend this distance; and the crossing may unnecessarily impact traffic capacity. Where the rail trail does not emerge at an existing intersection, a barrier and directional signing will be required to keep bicyclists and others from crossing at the unmarked location.

[27] Some traffic design guidelines suggest that crosswalks are not required with ADT volumes below 7,000.

Table 20 Roadway Crossings at Existing Intersections	
Maximum Distance from Coastal Rail Trail to Intersection:	Street width 40 feet or less: 200-250 feet Street width over 40 feet: 250 feet
Length of barrier to prevent informal crossing	Street width 40 feet or less: 50 feet Street width over 40 feet: 100 feet
Intersection Improvements	Warning Signs for Motorists Right turn on red prohibitions Elimination of high speed and free right turns Adequate crossing time Pedestrian activated signals

One of the key problems with using existing intersections is that it requires bicyclists to transition from a separated two-way facility to pedestrian facilities, such as sidewalks and crosswalks. Widening and striping of the sidewalk (if possible) between the trail and intersection may help to alleviate some of these concerns.

Signalized Roadway Crossings (Type 3)

When a trail must cross a roadway that exceeds the maximum thresholds identified for unprotected crossings, generally 10,000 ADT'S, some type of signalized control must be installed to protect the trail users (see Figure 6.8). Signals require the input of local traffic engineers, who review potential impacts on traffic progression, capacity, and safety. On corridors with timed signals, a new trail crossing may need to be coordinated with adjacent signals to maximize efficiency. Trail signals are normally activated by push buttons, but also may be triggered by motion detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street and trail volumes. The signals may rest on flashing yellow or green for motorists when not activated, and should be supplemented by standard advance warning signs.

Grade-Separated Roadway and Railroad Crossings (Type 4)

Arterials, expressways, and freeways carrying over 25,000 ADT will probably require some type of grade separation, either an undercrossing or overcrossing (Figures 6.9 and 6.10). Overcrossing alternatives are typically less expensive than tunneling under a roadway, but require as much as 400 or 500 feet of approach structure on each end due to the maximum 5% gradient as specified by ADA. Overcrossings also have a higher visual impact and meet with resistance from some trail users who may attempt to cross at-grade rather than climb the approach ramps.

Safety concerns are a major issue with both railroad overcrossings and undercrossings (tunnels). In both cases trail users may be temporarily 'out-of-sight' from public view, and have poor visibility themselves. Undercrossings, like parking garages, have the reputation of being places

where crimes occur. Most crime on trails, however, appears to have more in common with the general crime rate of the community and the overall usage of the trail than to any specific design feature. There are design and operation measures which can address trail user concerns. For example, an undercrossing can be designed to be spacious, well lit, with emergency call phones at each end, and completely visible for its entire length prior to entering.

Other potential problems with undercrossings include conflicts with utilities, drainage, flood control, and maintenance requirements. Proper design to address these issues will reduce potential problems including providing adequate access for maintenance vehicles.

Table 21
Grade Separated Roadway Crossings

Traffic volume thresholds:	25,000 - 45,000 ADT
Recommended minimum trail width:	8 feet (under crossings should provide tapered sides with wider clearances at top)
Recommended minimum overhead clearance:	10 feet (14 feet if equestrian use)
Estimated structure costs per linear feet:	$600 -$800
Maximum gradient per ADA:	5%
Ancillary features:	lighting, call phones, landscaping

6.8 At-Grade Railroad Crossings

The Coastal Rail Trail will cross at numerous established roadway crossings. Generally the trail crossing configuration will be where the Coastal Rail Trail crosses a roadway directly adjacent to the railway tracks at an uncontrolled or controlled intersection (Type 1 & 2).

Lateral access points to the Coastal Rail Trail will be provided by a combination of existing roadways, sidewalks, and pathways. In some cases, new trails or connectors into adjacent neighborhoods may be provided. Where lateral movement is heavy, new at-grade crossings will be required approximately every 500 feet. The City of Carlsbad proposes one at-grade lateral crossing, seven are proposed by the City of Encinitas, and four are proposed by the City of Del Mar. As the trail proceeds through MCAS Miramar, the trail will cross the Y spur line and there is an interim at-grade lateral crossing proposed west of I-805, within the City of San Diego. Grade separated crossings to accommodate all lateral movement will be prohibitively expensive and, in some cases, not warranted by the volumes of pedestrians or bicyclists. Pedestrian grade crossings of active mainlines currently exist in San Mateo County, and the California cities of San Clemente, San Juan Capistrano, and Dixon, California, among other locales.

The North San Diego County Transit Development Board has an adopted policy, which states that the Board will permit ten year leases for the development of pedestrian at-grade crossings of the San Diego Northern Railway, when the requesting public agency agrees to provide fencing on both sides of the railway and fund the installation of a grade separated pedestrian crossing at the end of the lease period. The California Public Utilities Commission (CPUC) has generally taken the position of not allowing additional at-grade crossings. Any proposed pedestrian at-grade crossings will require approval by the CPUC.

6.9 Coaster/Trolley Stations

The Coastal Rail Trail will generally go around the transit stations rather than use existing platforms to avoid conflicts with pedestrians boarding trains. Figure 6.12 reflects several options to route trail users through a station for those users accessing the train. In the design of future rail stations, the trail may be routed directly through the station when the boarding platforms are 10 feet wide or more, passenger usage is for a limited time of day, or alternative routes around transit stations are circuitous and involve multiple street crossings. Currently, bicycle riding is not permitted on the platforms due to safety concerns and is not being considered as an option by NCTD. It is recommended that when agreements are developed between the railroad and the trail operator that agreement consider the use of boarding platforms under the following conditions:

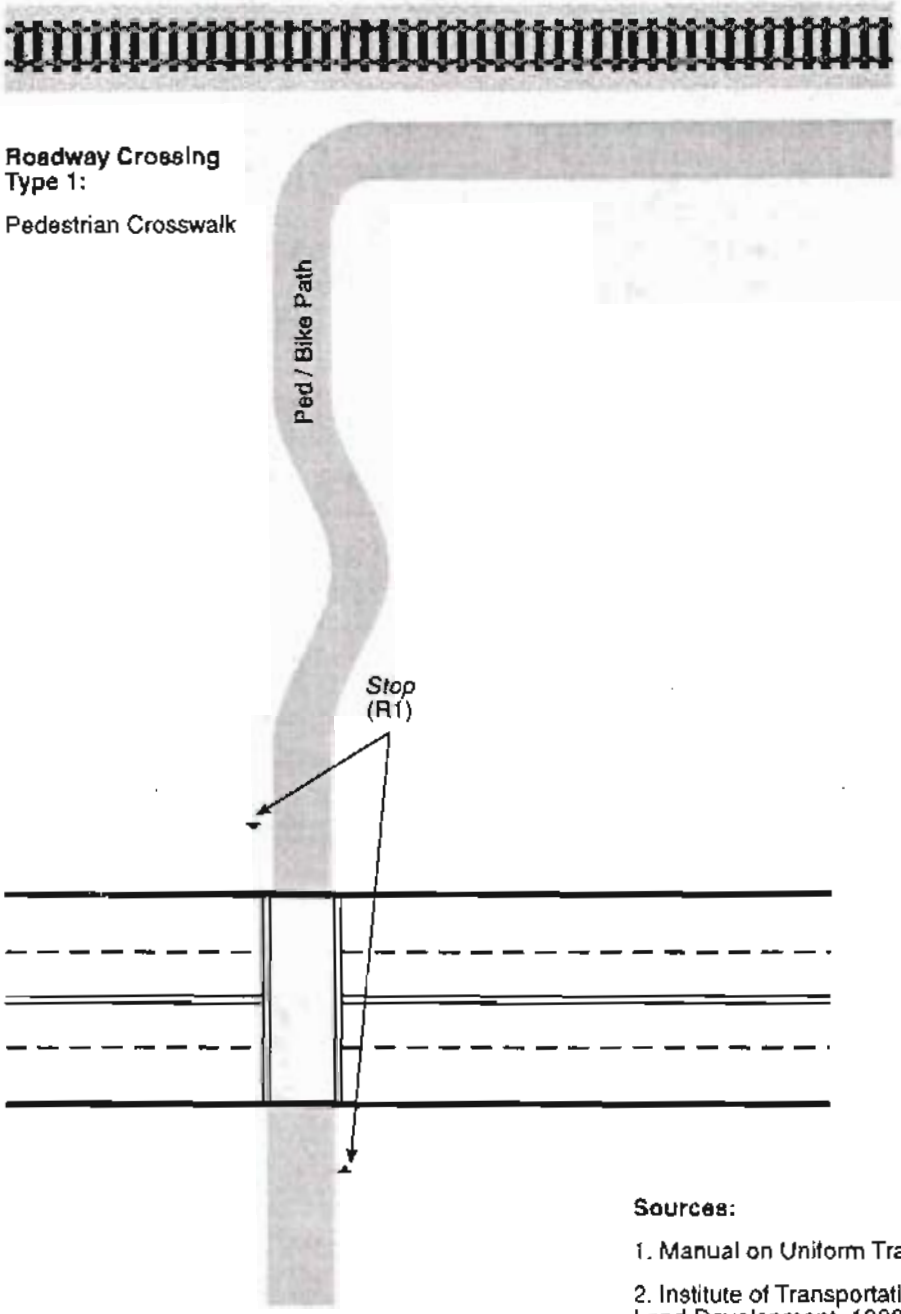
- A demonstration period of one year is allowed during which complaints and accident information can be compiled.
- The trail officially 'terminates' where it interfaces with the platform, and it is designed to stop or slow bicyclists through the use of bollards or gates.
- Bicyclists be required to dismount when trains are stopped at the station.
- Maximum speed limit of 5 mph on the platform.
- Striping on the platform to designate the location of bicycle and pedestrian flow.

6.10 Utilities and Lighting

Surface and sub-surface utilities are located within the railroad right-of-way, impacting the location and construction of the Coastal Rail Trail. Utilities include active and abandoned railroad communications cable, signal and communication boxes, fiber optic cable, water and sewer lines, and telephone lines. The Coastal Rail Trail will be designed to avoid moving most active surface utilities, although utility poles no longer in use may be removed. The trail may be located directly over existing sub-surface utilities assuming (a) adequate depth exists between the trail surface and utility to prevent damage, and (b) agreements can be reached with the utility owner regarding access for repairs and impact to the trail.

Roadway Crossing Type 1:

Pedestrian Crosswalk



Sources:

1. Manual on Uniform Traffic Control Devices, 1988

2. Institute of Transportation Engineers, Transportation and Land Development, 1988

3. Investigation of Exposure Based Accident Areas: Crosswalks, Local Street, and Arterials, Knoblauch, 1987

4. Caltrans Highway Design Manual, Fifth Edition, Chapter 1000: Bikeway Planning and Design

5. Caltrans Traffic Manual

FIGURE 6.5	UNPROTECTED ROADWAY AT-GRADE CROSSING TYPE I	COASTAL RAIL TRAIL

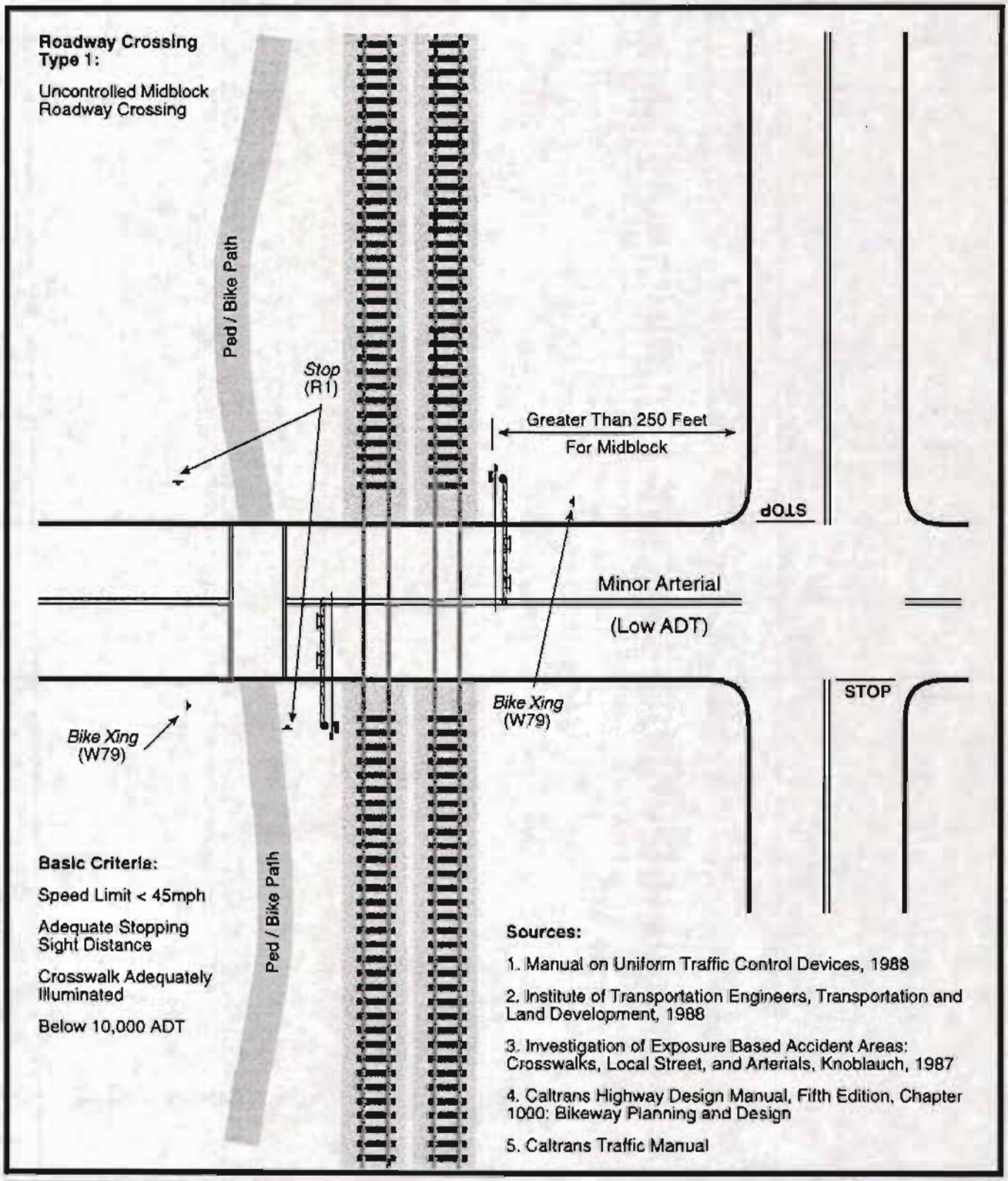


FIGURE 6.6	CLASS I ROADWAY CROSSING TYPE 1	COASTAL RAIL TRAIL

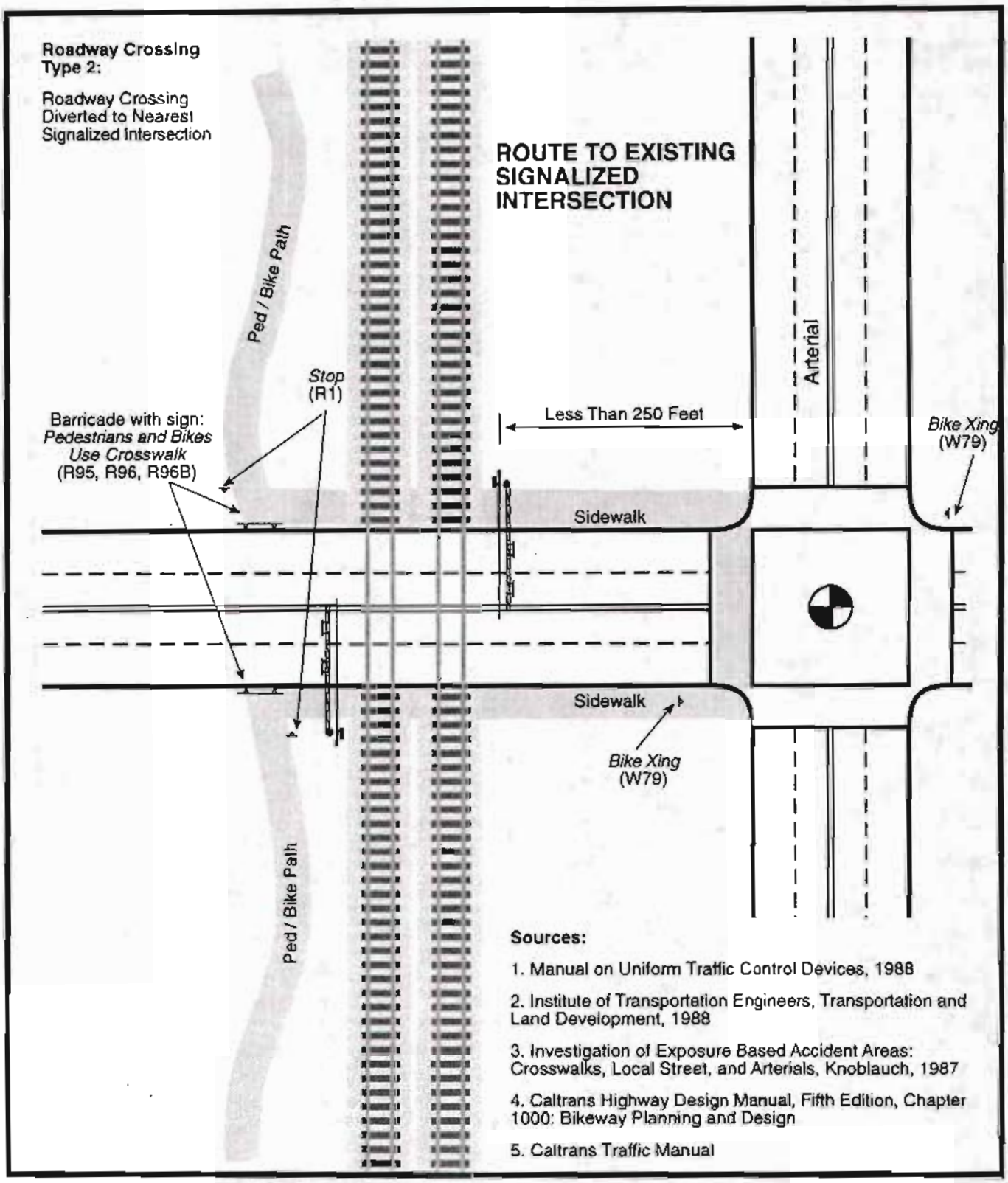
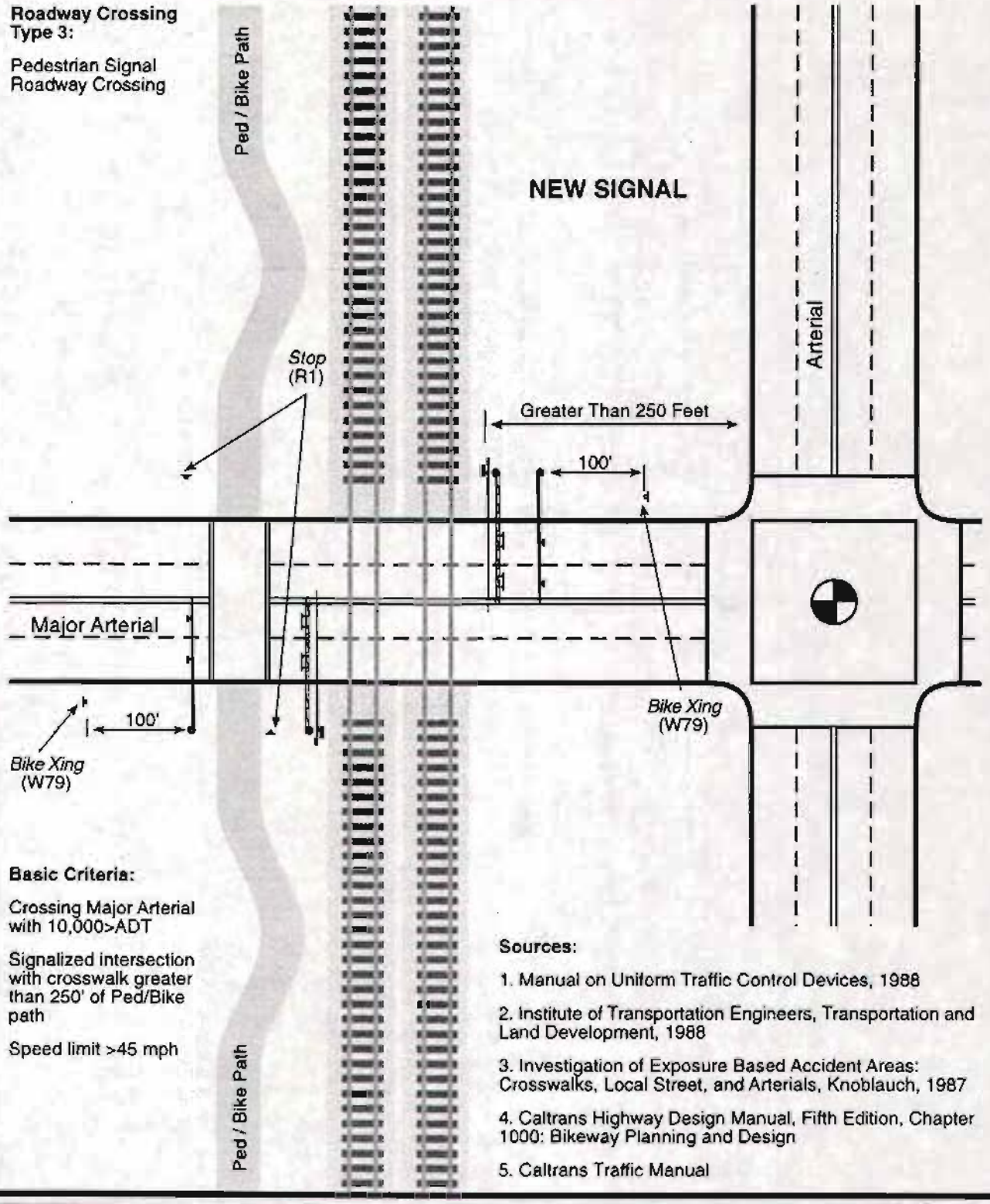


FIGURE 6.7	CLASS I ROADWAY CROSSING TYPE 2	COASTAL RAIL TRAIL

Roadway Crossing Type 3:

Pedestrian Signal Roadway Crossing



Basic Criteria:

Crossing Major Arterial with 10,000>ADT

Signalized intersection with crosswalk greater than 250' of Ped/Bike path

Speed limit >45 mph

Sources:

1. Manual on Uniform Traffic Control Devices, 1988

2. Institute of Transportation Engineers, Transportation and Land Development, 1988

3. Investigation of Exposure Based Accident Areas: Crosswalks, Local Street, and Arterials, Knoblauch, 1987

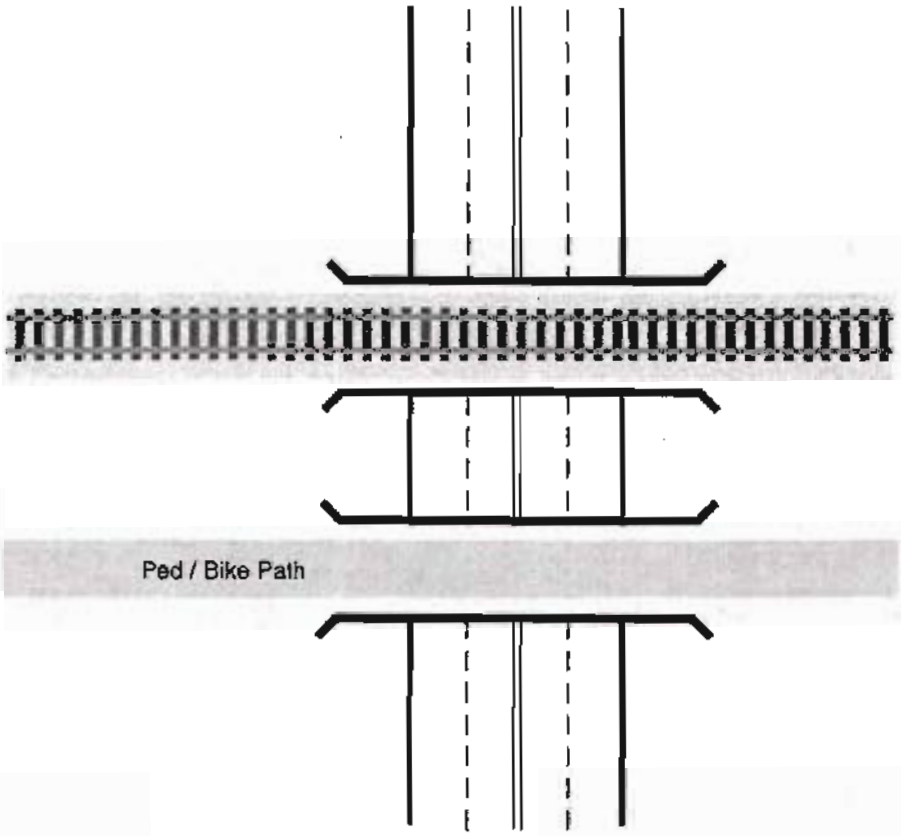
4. Caltrans Highway Design Manual, Fifth Edition, Chapter 1000: Bikeway Planning and Design

5. Caltrans Traffic Manual

FIGURE 6.8	CLASS I ROADWAY CROSSING TYPE 3	COASTAL RAIL TRAIL

Grade Separated Roadway Crossing Type 4:

Bridge



Sources:

1. Manual on Uniform Traffic Control Devices, 1988

2. Institute of Transportation Engineers, Transportation and Land Development, 1988

3. Investigation of Exposure Based Accident Areas: Crosswalks, Local Street, and Arterials, Knoblauch, 1987

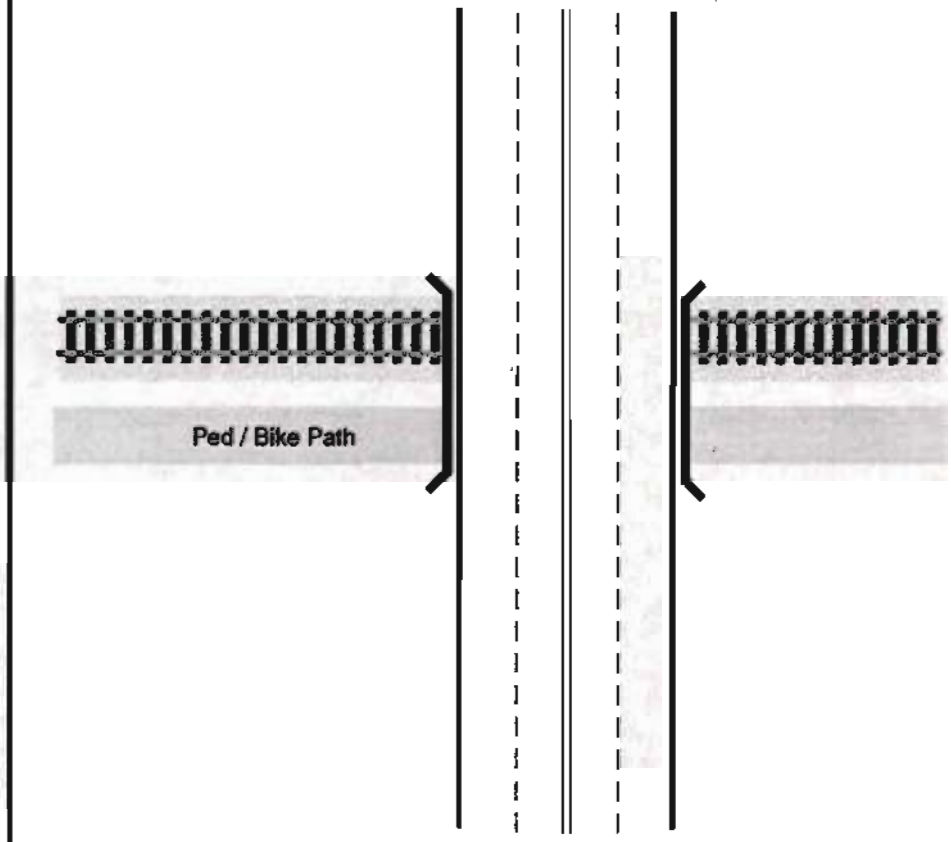
4. Caltrans Highway Design Manual, Fifth Edition, Chapter 1000: Bikeway Planning and Design

5. Caltrans Traffic Manual

FIGURE 6.9	GRADE SEPARATED ROADWAY CROSSING TYPE 4	COASTAL RAIL TRAIL

Grade Separated Roadway Crossing Type 4:

Undercrossing



Sources:

1. Manual on Uniform Traffic Control Devices, 1988
2. Institute of Transportation Engineers, Transportation and Land Development, 1988
3. Investigation of Exposure Based Accident Areas: Crosswalks, Local Street, and Arterials, Knoblauch, 1987
4. Caltrans Highway Design Manual, Fifth Edition, Chapter 1000: Bikeway Planning and Design
5. Caltrans Traffic Manual

FIGURE 6.10	GRADE SEPARATED ROADWAY CROSSING TYPE 4	COASTAL RAIL TRAIL

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Pedestrian bridge - Fredericksburg, Virginia

· City of Newport Beach

FIGURE 6.11	BRIDGE OVERCROSSINGS	COASTAL RAIL TRAIL

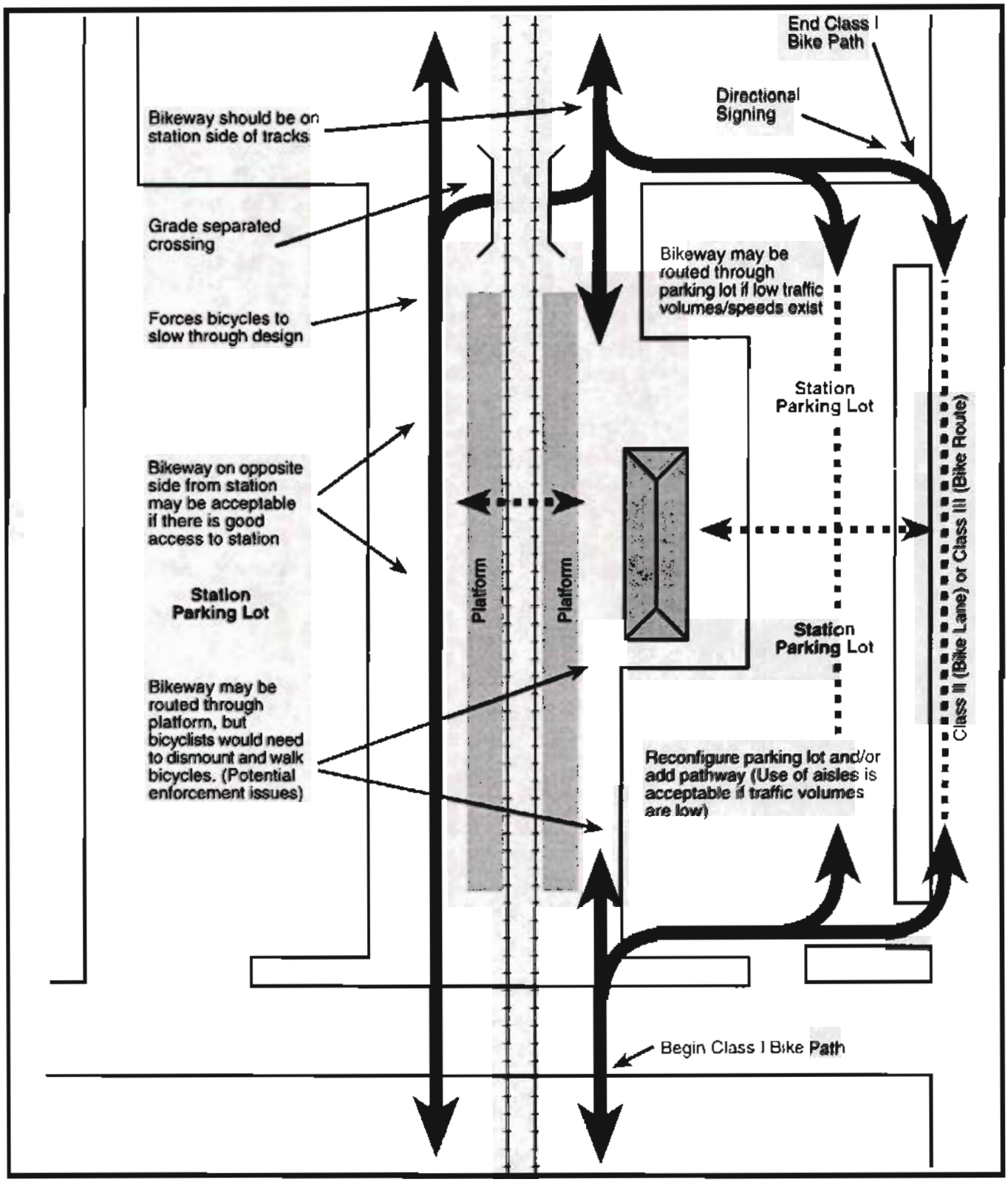


FIGURE 6.12	STATION ROUTING OPTIONS	COASTAL RAIL TRAIL

7.0 Signing and Marking

Crossing features for all roadways include warning signs for both vehicles and trail users. The type, location, and other criteria are identified in the Manual for Uniform Traffic Control Devices (MUTCD) and the CalTrans Highway Design Manual. Consideration must be given for adequate warning distance based on vehicle speeds and line of sight, with clear visibility of signing absolutely critical. 'Catching the attention' of motorists jaded to roadway signs may require additional alerting devices such as a flashing light, roadway striping, or changes in pavement texture. Signing for trail users must include a standard 'STOP' sign and pavement marking, sometimes combined with other features such as bollards or a zigzag approach to slow bicyclists. Care must be taken not to place too many signs at crossings lest they begin to lose their impact and may be ignored.

Direction signing is useful for trail users and motorists alike. For motorists, a sign reading 'Coastal Rail Trail Xing' along with a trail emblem or logo helps at crossings to keep them aware of potential trail users nearby.

The signing and marking of the Coastal Rail Trail is designed to be an integrated system of elements to communicate the following:

- Orient trail users along the route;
- Warn trail users of potential hazards;
- Provide for the interpretation of natural and cultural features along the trail; and
- Announce the trail to motorists and train passengers;

The signage system is designed to utilize the accepted design standards and fabrication technology utilized throughout San Diego County for marking roadways. The signage system includes the following types of signs and markings, a description and illustrations of each follow:

- Standard CalTrans and MUTCD sign panels,
- Coastal Rail Trail Logo sign panel,
- Trail information sign panels,
- Kiosk,
- Trail map,
- Stripes of reflective tape in Coastal Rail Trail colors, and
- Pavement markings.

7.1 Standard CalTrans and MUTCD Sign Panels

For safety and consistency, the rail trail includes the required and recommended CalTrans signing and marking standards. In addition, all signs and markings should conform to the standards developed in the MUTCD.

Standard signs on the trail should match the design of vehicular signs, but their size should be smaller, in scale with the needs of pedestrian and bicycle traffic. Table 20 summarizes the recommended signing and striping program for the Coastal Rail Trail. Figures 7.1 and 7.2, bike lane signing and striping, illustrate the recommended signing program for Class II portions of the rail trail at signalized and unsignalized intersections. Class III bike routes will use standard CalTrans signs in conjunction with a Coastal Rail Trail logo sign (Figure 7.3).

Recommended pavement markings should be consistent with CalTrans Standard Specifications included in the appendix and MUTCD. In general, all signs should be located a minimum 3 to 4 feet from the edge of the paved surface, have a minimum vertical clearance of 8.5 feet (when located above the trail surface), and be a minimum of 4 feet above the trail surface (when located on the side of the trail). The designs (though not the size) of signs and markings should be the same as used for motor vehicles.

Table 22
Recommended Signing and Marking

Item	Location	MUTCD Designation
No Motor Vehicles	Entrances to trail	R5-3
Use Ped Signal/Yield to Peds	At crosswalks; where using sidewalks	R9-5,6
Bike Lane Ahead: Right Lane Bikes Only	At beginning of bike lanes	R3-16 R3-17
STOP, YIELD	At trail intersections with roads	R1-1,2
Bicycle Crossing	For motorists at trail crossings	W11-1
Bike Lane	At the far side of all arterial intersections	D11-1
Hazardous Condition	Slippery or rough pavement	W8-10
Turns and Curves	At turns and curves which exceed 20 mph design specifications	W1-1,2 W1-4,5,6
Trail Intersections	At trail intersections where no STOP or YIELD required, or sight lines limited	W2-1, W2-2 W2-3, W2-4, W2-5
STOP Ahead	Where STOP sign is obscured	W3-1
Signal Ahead	Where signal is obscured	W3-3
Bikeway Narrows	Where bikeway width narrows or is below 8'	W5-4
Downgrade	Where sustained bikeway gradient is above 5%	W7-5
Pedestrian Crossing	Where pedestrian walkway crosses trail	W11A-2
Restricted Vertical Clearance	Where vertical clearance is less than 8'6"	W11A-2
Railroad Crossing	Where trail crosses rail tracks at grade	W10-1
Directional Signs (i.e. Beaches, Downtown, Coaster Station, etc.)	At intersections where access to major destinations is available	D1-1b(r/l) D1-1©
Right Lane Must Turn Right; Begin Right Turn Here, Yield to Bikes	Where bike lanes end before intersection	R3-7 R4-4
Coastal Rail Trail Logo	At all trail entrances, major intersections/ access points	n/a
Trail Regulations	All trail entrances	n/a
Multi-purpose Trail: Bikes Yield to Pedestrians	All trail entrances	n/a
Bikes Reduce Speed & Call Out Before Passing	Every 2,000 feet	n/a
Please Stay On Trail	In environmentally-sensitive areas	n/a
Caution: Storm Damaged Trail	Storm damaged locations	n/a
Trail Closed: No Entry Until Made Accessible & Safe for Public Use	Where trail or access points closed due to hazardous conditions	n/a
Speed Limit Signs	Near trail entrances: where speed limits should be reduced from 20 mph	n/a
Trail Curfew 10PM - 5AM	Based on local ordinances	n/a

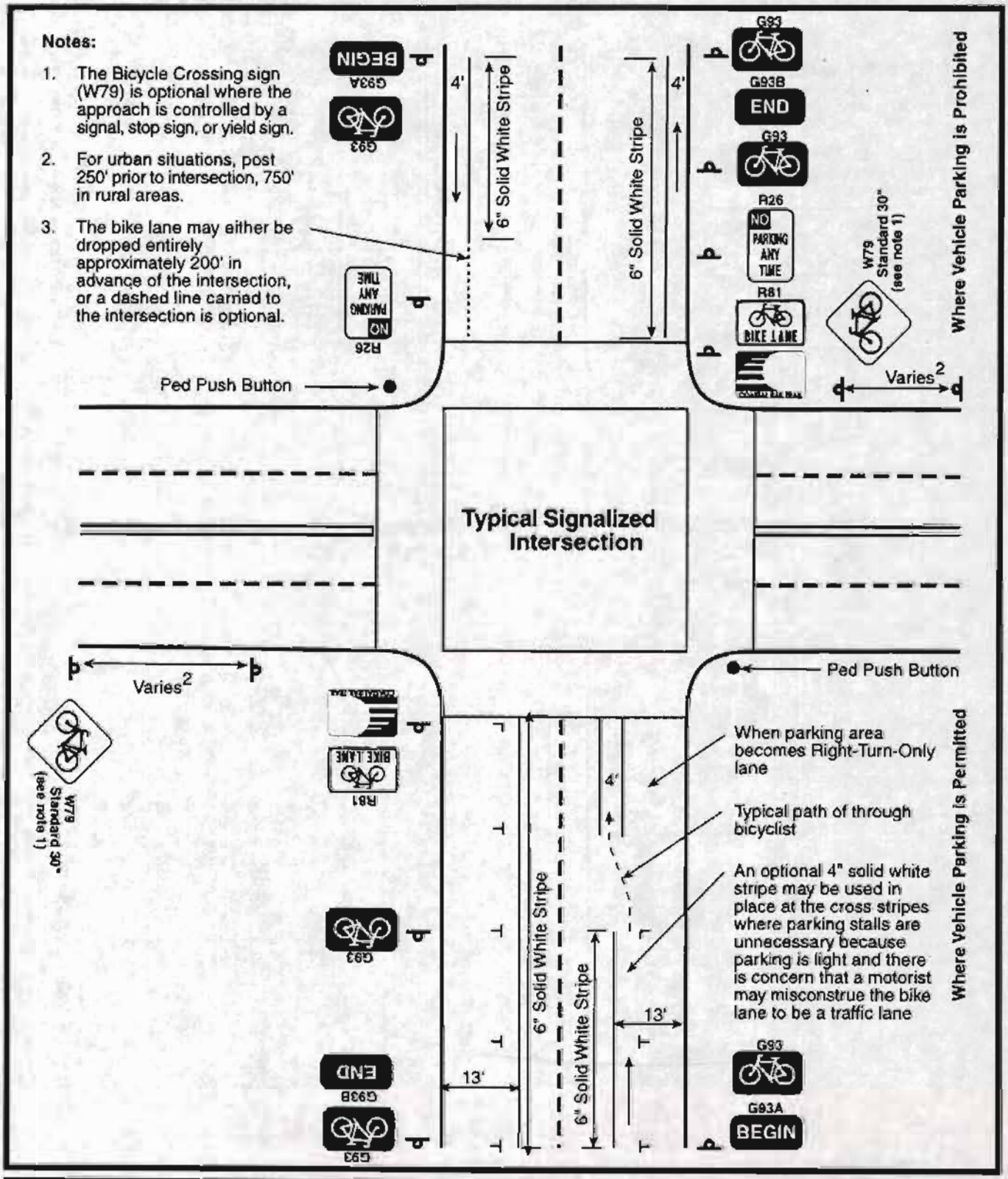


FIGURE 7.1	BIKE LANE SIGNING AND MARKING (CLASS II)	COASTAL RAIL TRAIL

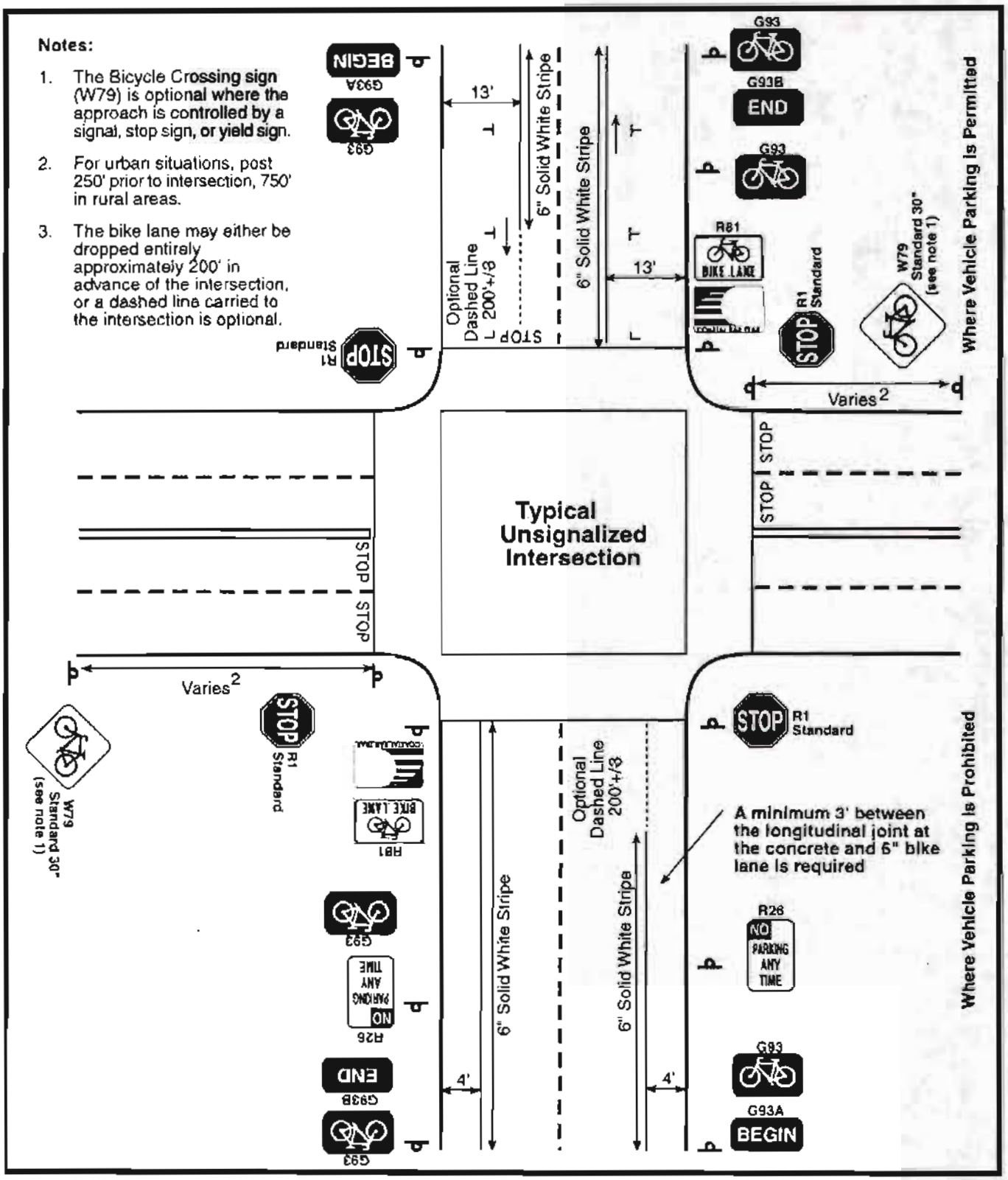
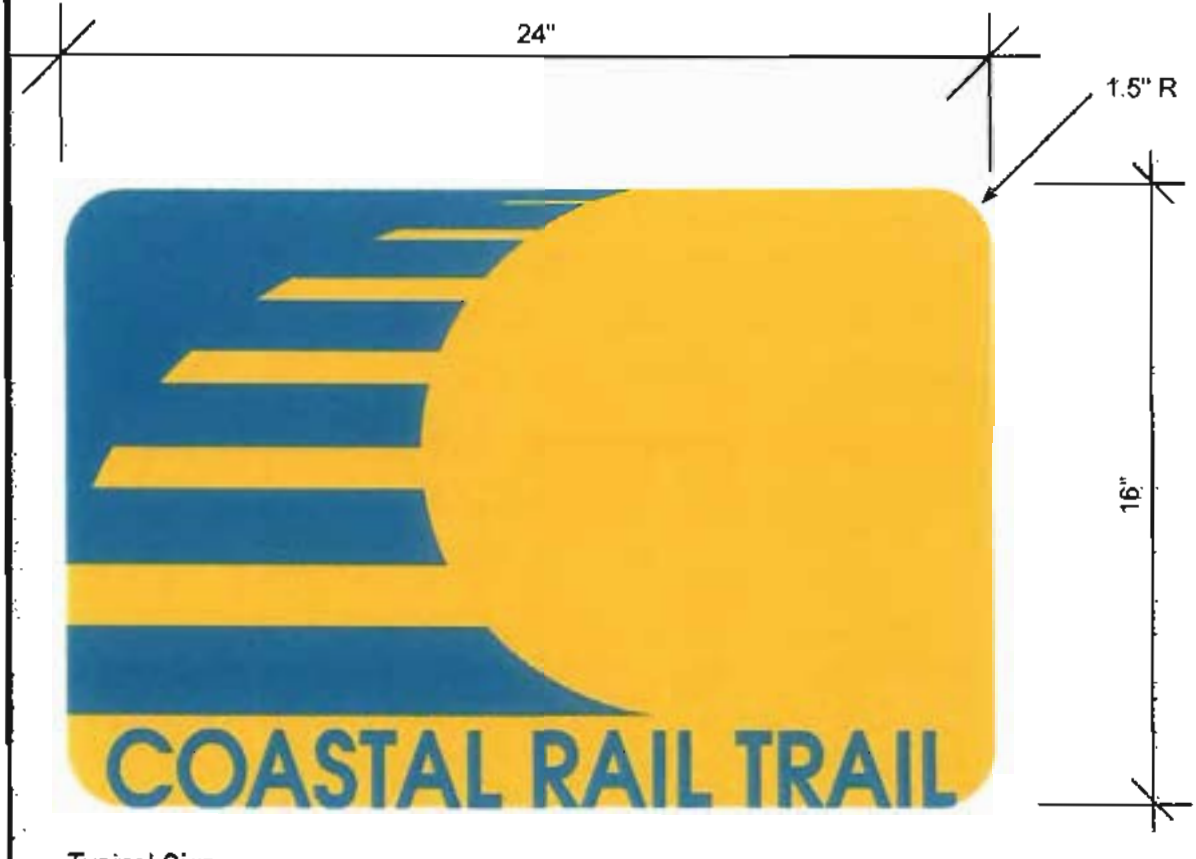


FIGURE 7.2	BIKE LANE SIGNING AND MARKING (CLASS II)	COASTAL RAIL TRAIL

Logo
Colors to match Pantone Process Yellow and Pantone Blue CVU

Logo with City Seal incorporated



Typical Sign
not to scale

FIGURE 7.3	COASTAL RAIL TRAIL LOGO	COASTAL RAIL TRAIL

7.2 Coastal Rail Trail Signs

Coastal Rail Trail Logo

The Coastal Rail Trail will be identified by a consistent, unique logo that helps guide people to and along the trail. This logo is represented on the cover and in Figure 7.3. The colors and form of the logo (yellow and dark blue banding) graphically represents the various communities and environments along the Coastal Rail Trail. The fundamental concept for the trail's logo and signage system is the striped pattern of railroad ties. In the logo, the stripes disappear around the bend (see Figure 7.3), indicating the continuity of the route.

A Coastal Rail Trail logo sign panel and a sign stating the trail regulations should be located at each trail head and at the top of all major Coastal Rail Trail sign poles to identify the trail. Where the trail is reduced to a bike lane along a street, the required signage includes a Coastal Rail Trail sign panel and an MUTCD standard bike lane sign (code R81) mounted on existing poles, where possible. Additionally, the trail along the street is identified with the use of five stripes (two stripes of yellow between three stripes of dark blue) of reflective tape (see Figure 7.4).

In addition to the placement of the Coastal Rail Trail logo sign panels along the trail, stripes of reflective tape should be employed to quickly identify the trail as it passes through a range of environments. Three inch wide tape (3M or approved equal) should be wrapped in parallel stripes (two yellow between three blue) around existing public elements such as utility poles along the trail (see Figures 7.4 and 7.5).

Bollards should follow the San Diego Regional Standard Drawing No. M-16 for a 'Removable Post'. The bollard is a single 48-inch tall by 4 inch O.D. (outside diameter) steel pipe set in a 5 inch I.D. (inside diameter) steel sleeve in a concrete footing. It should be placed on the centerline of the trail at all entrances to prevent motor vehicles from entering. It should be locked to the sleeved footing for removal by emergency vehicles. The bollard should be marked with reflective tape further identifying it as part of the Coastal Rail Trail (see Figure 7.5).

The Coastal Rail Trail logo should be copyrighted for use only by the trail manager. Any proceeds generated from the use of the logo should be directed to the trail manager and used for further enhancement and/or maintenance of the trail.

Trail Information Sign Panels

A variety of messages need to be communicated to the trail user along the route. Informational signs to state the trail regulations, directions to associated features, or warnings of potential safety hazards. A Coastal Rail Trail logo sign panel and a sign stating the trail regulations should be located at each trailhead (see Figure 7.5). Directional information is typically site specific, such as indicating the intersection of another trail. Signs warning the trail user of potential safety hazards and regulations for the use of the trail should be printed in both English and Spanish (see Figure 7.6). Trail information should be printed on a series of long rectangular sign panels (see Figure 7.7).

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Kiosk

A kiosk is a large sign panel that informs the user about the trail and/ or the adjacent community. A kiosk should be located at active trail heads, and at points along the trail which require additional signs; such as, at busy community intersections or at trail stations where there is the opportunity to relay information regarding historic or cultural features.

The design of the kiosk replicates a manual switch stand, common along the railroad tracks. Each kiosk includes a trail map, regulations, community information and/or interpretive information. All information should be printed in English and Spanish. All kiosks should be designed to meet visual and physical access requirements of the Americans with Disabilities Act, including features such as large type and/ or panels in Braille for the visually impaired (see Figure 7.8). Kiosks may be designed to include the acknowledgment of sponsorships by local agencies, organizations, and/or corporations.

Trail Map

The trail map is a simplified graphic illustrating the relative locations of cities, Coaster Transit Stations, intersecting trails, and ten kilometer markers and/or mile markers along the trail (see Figure 7.9). The graphic design of the map is based on typical maps of stations along a railroad line. The trail map should be on rail brochures, publications, as well as on each kiosk with an indication on the kiosk as to its placement along the trail. Like the Coastal Rail Trail logo, the trail map should be copyrighted as the property of the trail manager.

Pavement Markings

Bold stripes on the pavement alert bicyclists and motorists of intersections (see Figure 7.10). Stripes and numerals mark the kilometers between Oceanside and San Diego for trail users and are visible to the train passengers (see Figure 7.11). Trail users traveling south read the kilometers from Oceanside, while those traveling north read the kilometers from the Santa Fe Depot.

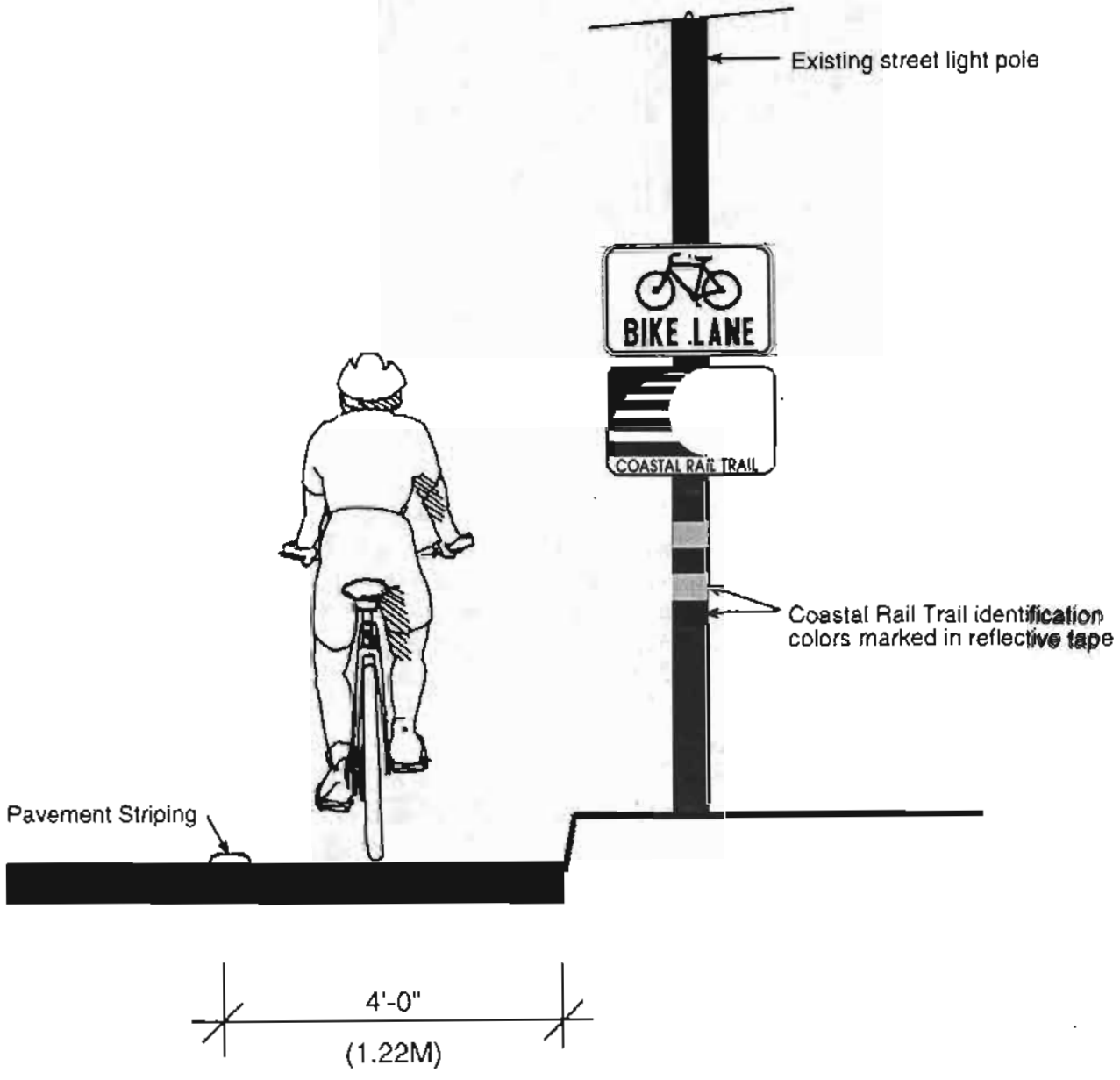


FIGURE 7.4	BIKE LANE SIGN	COASTAL RAIL TRAIL

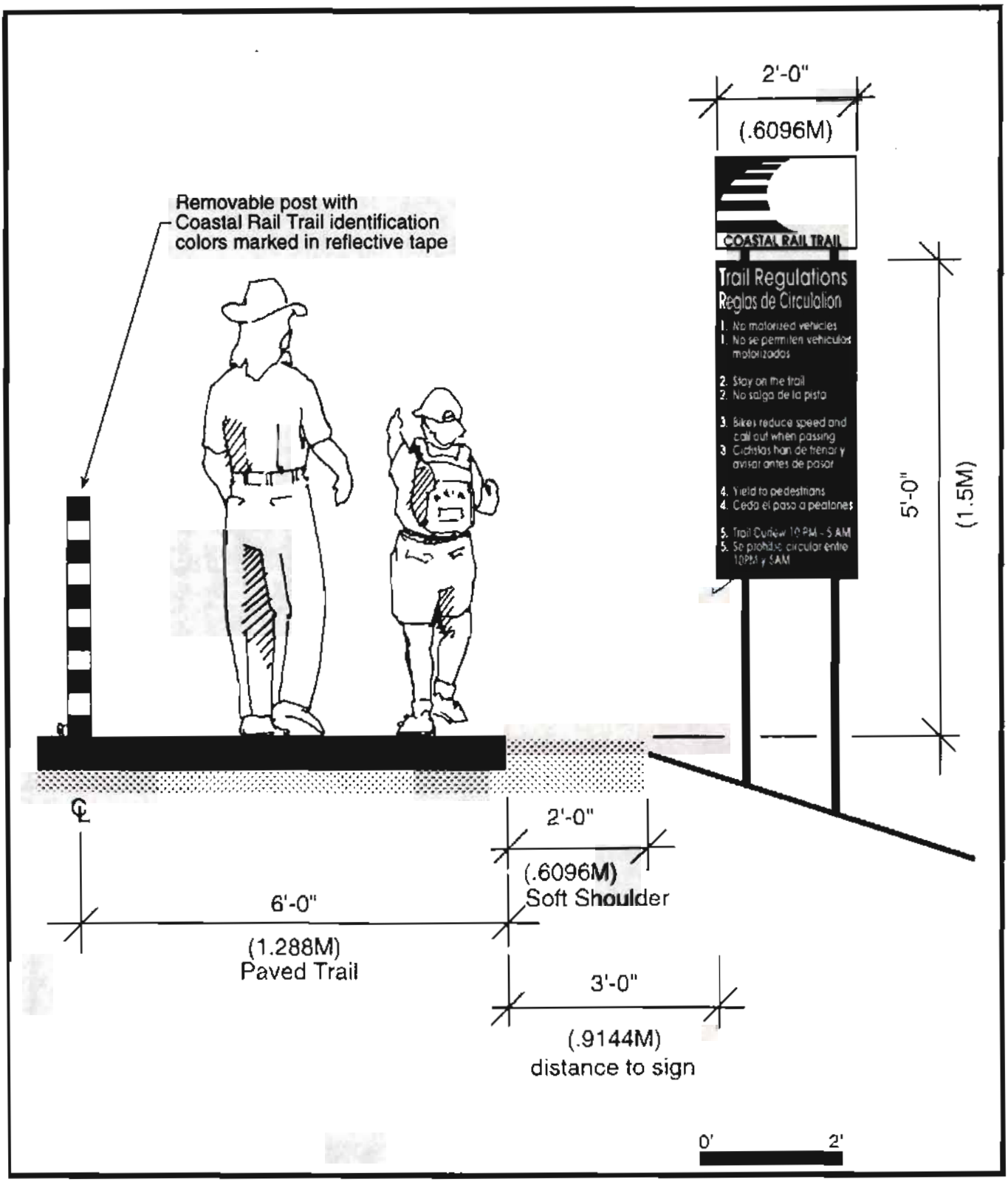


FIGURE 7.5	TRAIL HEAD SIGN	COASTAL RAIL TRAIL

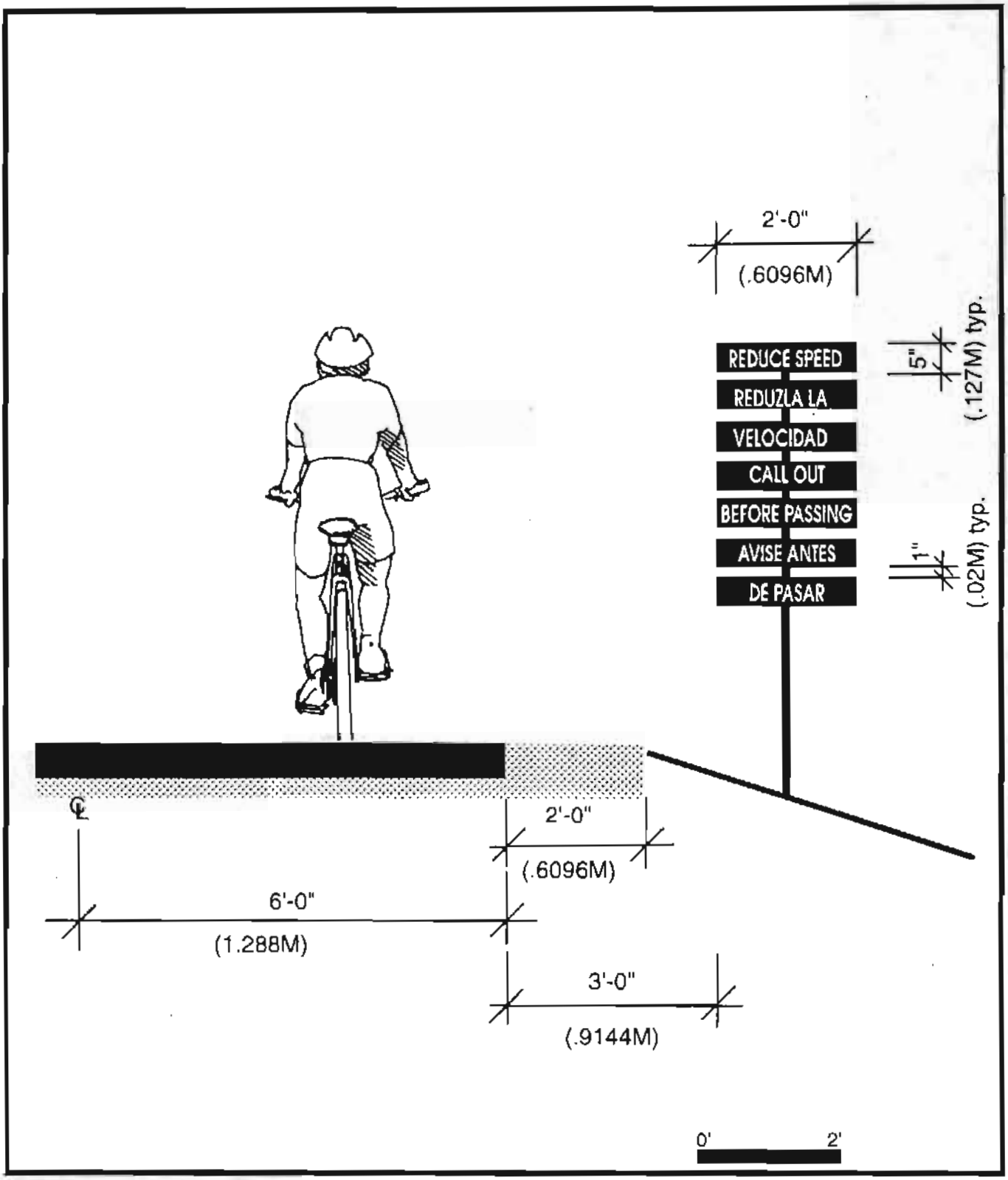


FIGURE 7.6	BILINGUAL SAFETY SIGN POST	COASTAL RAIL TRAIL

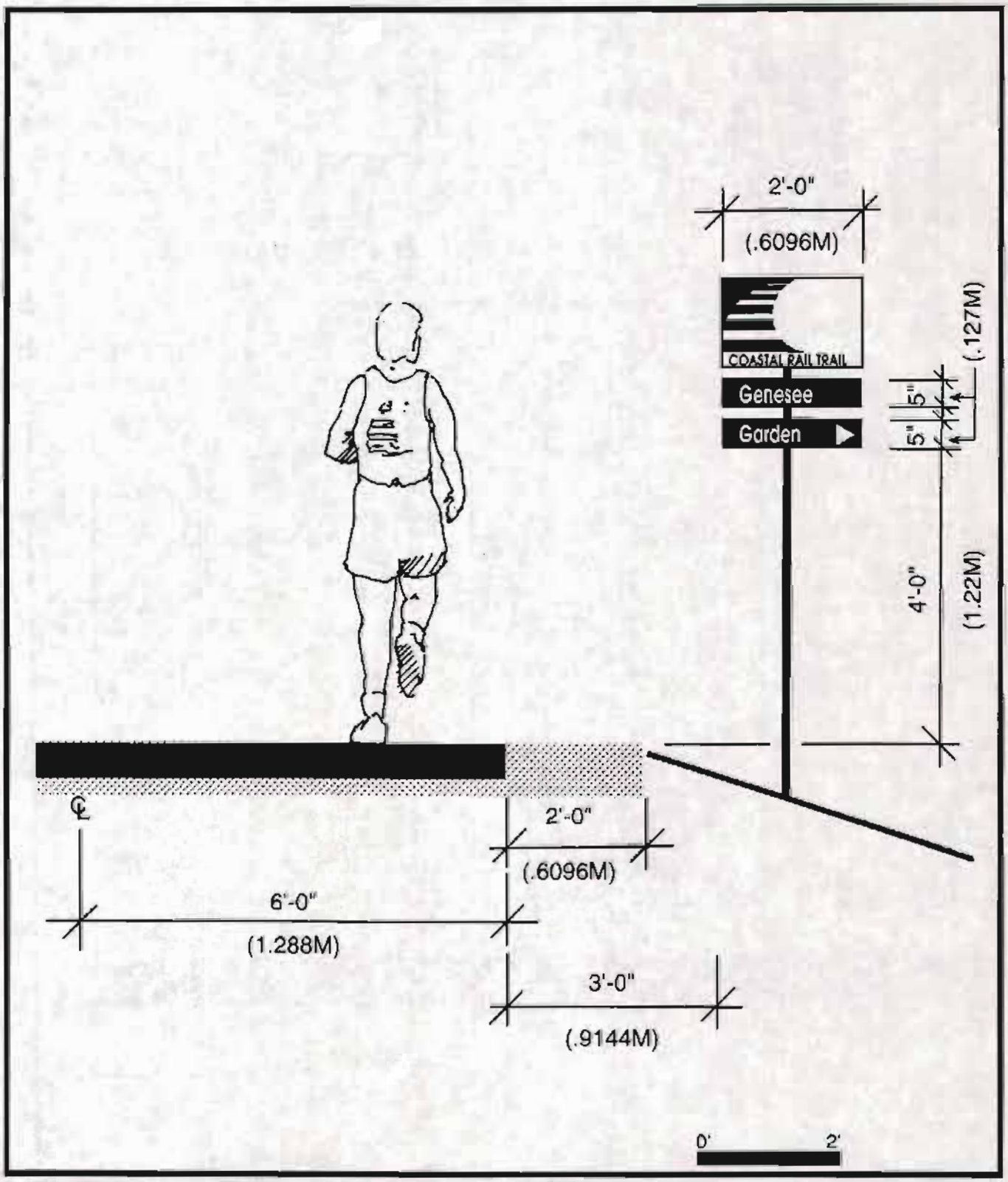
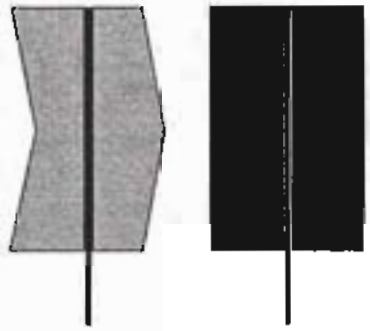
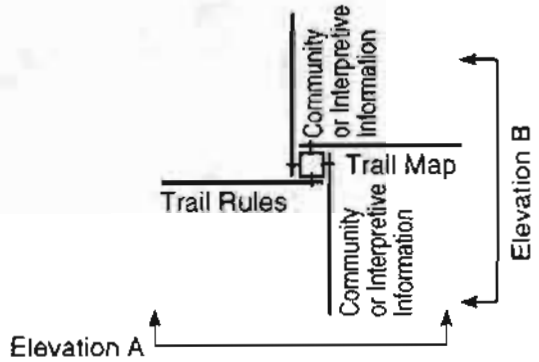


FIGURE 7.7	TRAIL INTERSECTION SIGN POST	COASTAL RAIL TRAIL





Elevation A **Elevation B**

Plan View

The kiosk is designed after the railroad's manual switch stand.

Kiosks may be located at trail heads or at trail stations.

One direction of panels will discuss interpretive information and/or note special community or trail events. (see plan view)

Panels facing the other direction will provide trail regulations and directional maps.

Panels are to be bolted to a square post. (see plan view)

One side of each panel should be written in English and the other in Spanish. Braille text should be adhered to both panels.

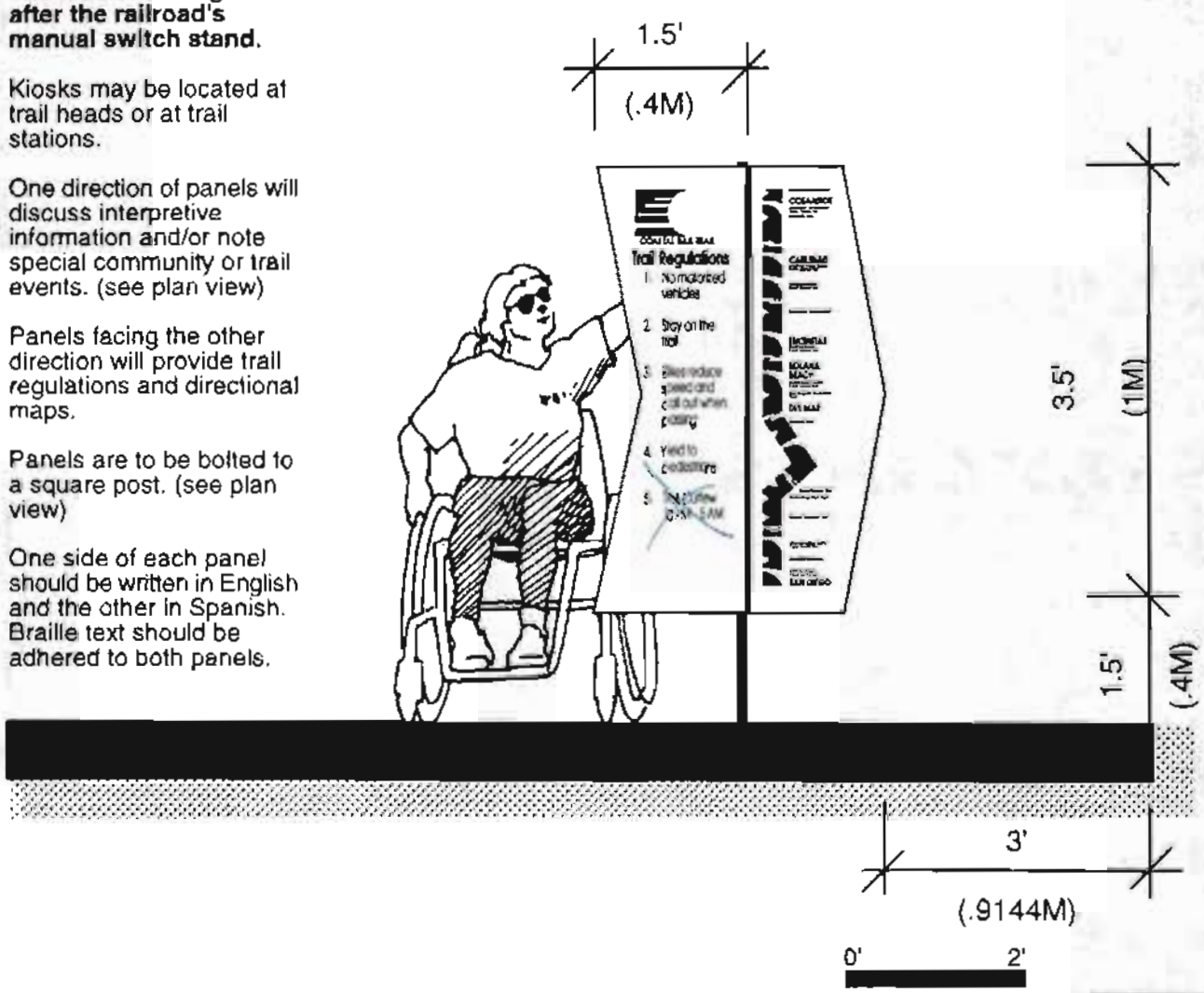


FIGURE 7.8	KIOSK	COASTAL RAIL TRAIL

SOLANA BEACH

Solana Beach Station
Coast Transit Station

San Dieguito River Park Trail

Detail of Trail Map

Trail Map

FIGURE 7.9	TRAIL MAP	COASTAL RAIL TRAIL

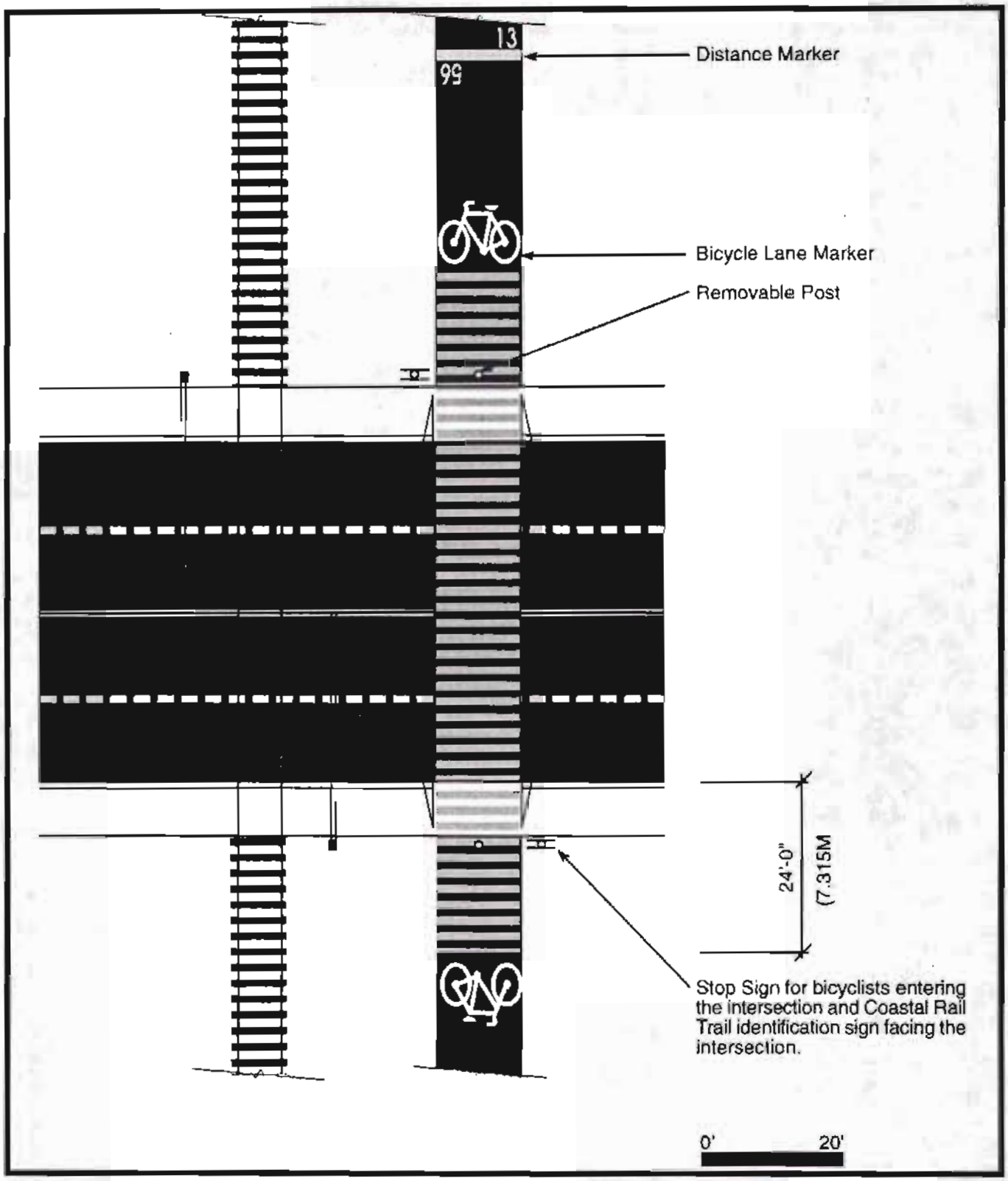
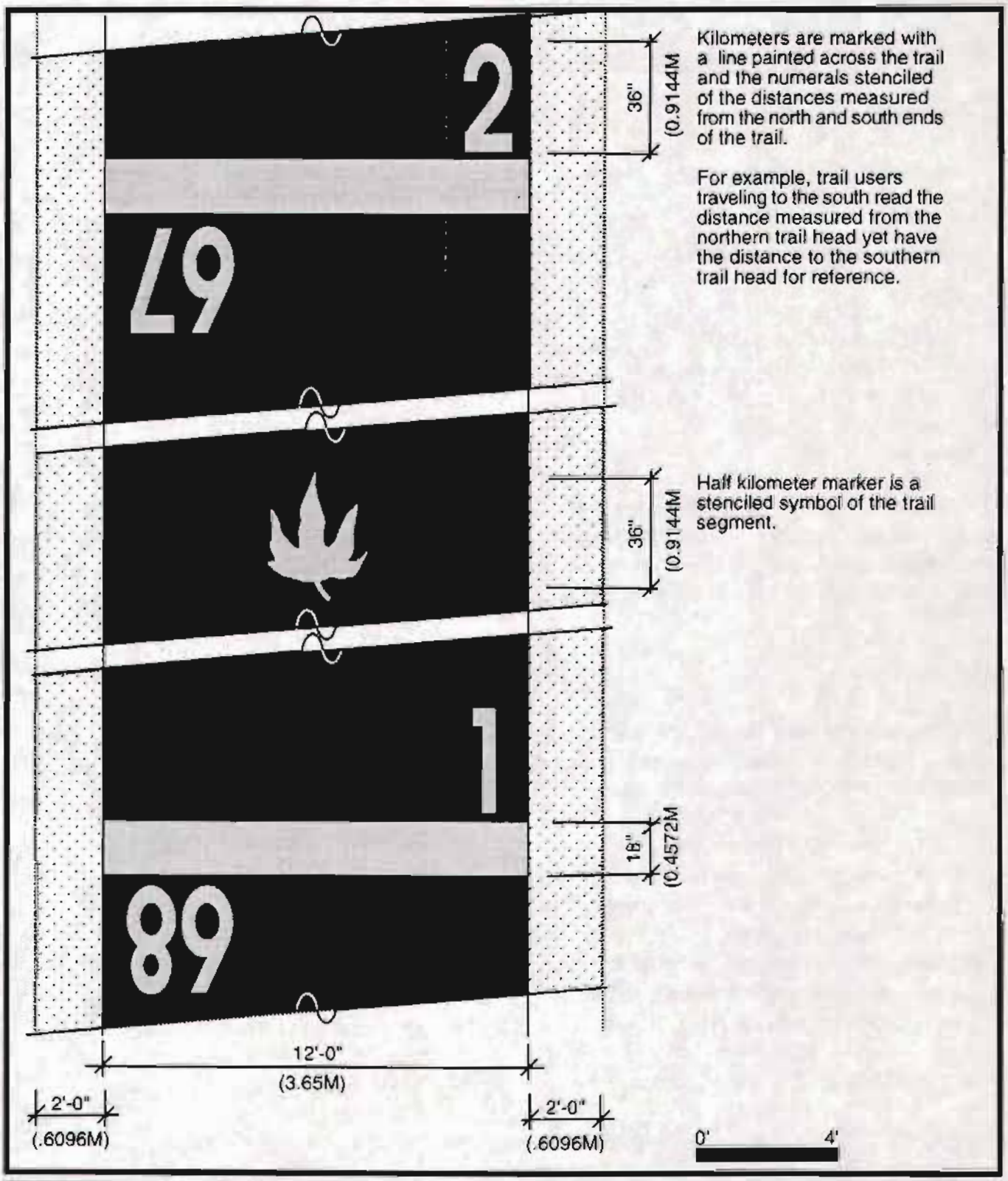


FIGURE 7.10	PAVEMENT MARKINGS AT INTERSECTION	COASTAL RAIL TRAIL



Kilometers are marked with a line painted across the trail and the numerals stenciled of the distances measured from the north and south ends of the trail.

For example, trail users traveling to the south read the distance measured from the northern trail head yet have the distance to the southern trail head for reference.

Half kilometer marker is a stenciled symbol of the trail segment.

FIGURE 7.11	DISTANCE MARKINGS ON PAVEMENT	COASTAL RAIL TRAIL

8.0 Landscaping Along the Trail

8.1 Trail Amenities

In areas where there is adequate right-of-way, the Coastal Rail Trail provides an opportunity to create a parklike corridor.

Additional facilities along the trail may include the following:

- Trailheads;
- Trail stations; and
- Site furnishings (benches, picnic tables, trash containers, drinking faucets, bicycle racks, solar phones and lighting).

Trailheads

Trailheads are the primary public entrance points to the trail. A trailhead may contain regulatory signs, waste receptacles, drinking fountains, seating, telephones, restrooms, air pumps, bike lockers and racks, and parking. Since the rail trail traverses past commercial development additional services such as restaurants, coffee shops, bicycle shops, etc., will be available along the trail.

Trail Stations

An urban node or trail station, is a point of interest along the path. They are not required at specific intervals but may be used to enhance the experience of the trail user. A station is an opportunity to engage the traveler in one or all of the following themes:

- Health and fitness;
- The associated geology, native plant community, animal habitat, and climate;
- Local cultural feature or event, either historical or current;
- Visual experience;
- The local railroad history and technology;
- Regional trail connection; and/or
- Improvements in progress such as the San Elijo Lagoon Botanical/Nature Walk, or the San Dieguito River Park;
- Biological resources such as the Audubon Center in Oceanside, Torrey Pines Reserve, etc.

Appropriate elements at an urban node may include but are not limited to:

- wide open areas;
- bicycle racks;
- benches;
- waste receptacles;

- kiosks;
- interpretive signage;
- shade provided by a canopy tree or a structure;
- drinking fountains; and/ or
- air pumps.

An urban node may be a type of improvement that may be constructed and/or maintained by a private donor, or organization, such as the Boys and Girls Club, Woman's Club, Bicycle Club, etc.

All urban nodes should also address train passengers. In subtle ways, such as the view of a bench in a quiet spot along the trail, or vegetation that heralds the seasons with color, the trail character should communicate its presence and landscape expressions with train riders.

Site Furnishings

A collection of site furnishings are recommended to meet the basic needs of trail users along the length of the Coastal Rail Trail including:

- seating;
- waste receptacles;
- drinking fountains;
- bicycle racks.

The site furnishings recommended are made from durable materials. They are simple forms that do not detract from the safety or aesthetics of the rail trail. While the site furnishings should be durable and vandal resistant, they should reflect the character of the community.

All furnishings should be specified for their proven durability in a public, coastal environment. Graffiti resistant finishes should be applied to applicable surfaces. Items should be located in high visibility areas to minimize inappropriate activity.

8.2 Landscaping

The landscaping along the rail trail is designed to express the natural and cultural elements of our local environment. The trail follows a route through the heart of many distinctly different regions of San Diego County. Traveling through the urban-industrial and backyard-residential areas of our cities and communities, to the native terrain associated with the coastal bluffs and inland canyons the trail user will experience the true essence of the San Diego coast.

The environment includes both the land along the trail, within the right-of-way, and the greater environment as it is viewed from the trail and/or trail stations. The trail landscape should respond to both local influences and city jurisdictions, while at the same time maintaining overall continuity. Improvements are recommended for the land adjacent to the trail within the right-of-way, to contribute to the functional and aesthetic goals of the trail. Functionally, the landscape

should not impede the efficient link between destinations nor constrict the operation of the rail service. Aesthetically, the landscape should provide a positive experience for the traveler. Landscape improvements include the following:

- Vegetation along the right-of-way reflecting both the local environment and the overall trail
- Irrigation to establish vegetation (temporary) or to provide ongoing, supplemental water to plants (permanent).

In addition to expected trail users such as walkers, joggers, recreational and commuter bicyclists, and roller bladers, the trail will be experienced visually by passing passenger trains. There is an increasingly large population of transit users who will benefit from the view of users on the path, but also the improved landscape of the corridor. Along much of the rail corridor, the rail trail will be within view of train passengers. The objective is to engage them in the spirit and activity of the trail. The train passenger will be able to read the kilometer/mile markers on the trail pavement, enjoy the added vegetation in each community, identify the trailheads, and will be encouraged to use the trail route.

Vegetation

A palette of plant species is recommended for the rail trail based on the uses of plants to serve the trails function and aesthetics; the characteristics of each species; and the plant's particular growth requirements (see Tables 23 and 24 Plant Matrix on pages 143-146).

Coastal Southern California is generally characterized as a "Mediterranean" climate type. Temperatures normally average 65-77 degrees year round. Rainfall usually occurs in winter and spring. Rain amounts are often unpredictable from one year to the next, however 10-14 inches on average are measured annually.

The Coastal Rail Trail generally lies within a single marine influenced zone. Winter and summer temperatures are heavily regulated by the ocean, resulting in increased summertime fog and cooler temperatures year round when compared to inland locations. All vegetation specified for the planting along the trail should be suited for these climate conditions. Further attention should be given during the construction design phase to matching specific species with the microclimates found along the trail corridor. For instance, the trail will remain virtually unprotected along segments in Cardiff while the trail along the oak woodlands in Rose Canyon provides an entirely different environment. Each presents special planting situations that require a solid understanding of plant growth characteristics.

Certain plants are more suitable to a given location than others based upon their requirements and performance. Plants are recommended for their versatility in a variety of environmental conditions. This will ultimately increase the survival and growth rates. In many cases, a single plant may be suitable for a range of uses. For example, an accent plant at an entry very near the ocean could also be suited for use as a physical barrier in another coastal location. Figures 8.1 through 8.6 are typical cross sections of the rail trail illustrating the uses of vegetation. Although

there are an infinite number of planting situations along the trail, the situations can be summarized in the seven categories listed below. Many species fall into more than one category.

- *Physical Barrier*. These species form a barrier to the pedestrian or cyclist when used in mass or in conjunction with others. The plants are dense, have sharp or stiff branches or other repelling characteristics. Even the appearance of some species is enough to deter people from entering restricted areas. However, plants with thorns or sharp protrusions, that could inflict injury or puncture bicycle tires, should be not be located within the first 5-10 feet adjacent to the trail.

- *Visual Screen*. The form and density of some plants can be useful in screening unattractive areas or to direct sight lines for safety purposes.

- *Erosion Control*. These plants are especially helpful in retaining soil on slopes. They contribute to the development of adequate soil cover and have strong root systems that help to hold the slope. Many native species are extremely success.f.ul in dry, shallow soils of slopes. If planted and established properly, native species will not require extensive irrigation, which can cause additional erosion.

- *Accent Planting*. For areas of high visibility or high use, some plants will provide special character. This comes in the way of seasonal color, striking form, shade, or other uniqueness. These species generally require more maintenance than others on the list, but if used in special locations, will provide a more pleasing landscape to the public.

- *California Native*. These native plant species are especially suited to the local, coastal environment of Southern California. They prosper with little care, and only require rainfall as a means of irrigation after establishment. Local wildlife depends on these species for food and cover. Native plants are also important in illustrating the true coastal character. See also the following section of Design and Implementation.

- *Coastal Planting*. In areas of close proximity to the ocean, some species have proven to be more tolerant of the salty and breezy air. These species should be used where directly exposed to these coastal conditions.

- *Inland Planting*. In inland areas of the Coastal Rail Trail, some species are more adaptive to the temperatures and evaportranspiration rates of the canyons that the trail passes through.

- *Urban Nodes*. These wide open areas provide a visual focus and identity and are discussed in the following section of Design and Implementation.

- *Community Zone*. A Community Zone is a stretch of trail that is readily identified as a particular community. For example the relaxed, beach community of Leucadia, in the City of Encinitas, is readily identifiable by the older commercial development, eucalyptus and cypress tree-lined streets, and modest, older residential development.

Design and Implementation

Because the Coastal Rail Trail is a large public recreational facility, the health and character of the vegetation will rely on the natural climate, public investment in plant material, and supplemental irrigation.

The character of the trail will differ, not only in response to the character of the adjacent landscape, but also in the level of investment in the size and spacing of plant materials, irrigation, and maintenance. The Landscape Zones are illustrated in Figure 8.7. The intent is to prioritize planting investment where it can inspire future funding. Planting priorities include highly visible urban areas in need of shade trees, lengths of the trail along an active community, and where slope erosion is a problem.

Plant Container Size and Spacing

Consideration should be given to the specified plant size at time of installation to establish the initial character, and the long-term investment in the planting based on construction funds available. In high visibility areas, such as trail intersections, entries, trail stations or urban nodes, larger container sizes should be used to deliver a more established appearance. Smaller container sizes can be considered in the transitional sections if funding does not allow for larger material. With proper establishment, they will grow quickly to blend into their surroundings. Spacing should be specified based on the plants' growth character.

Plant Maintenance

Plant species as listed in the Plant Matrix are identified according to their use, character, and needs. Most plants listed require little care and low amounts of water. In this way, the collective maintenance should be relatively minimal. However, a regular maintenance schedule should be developed to ensure long term landscaping success.

Typically, the first five to seven years is a critical period when regular maintenance by a skilled, professional team is needed most. Planting areas should be kept free of weeds and debris. Vegetation should be reviewed to minimize fire hazard. Irrigation systems should be serviced and adjusted for efficient use of water. Over time, maintenance such as pruning, fertilization, weed control, and irrigation should be gradually adjusted according to plant needs.

Irrigation

The irrigation of vegetation at special sections along the trail may be appropriate. Opportunities for the investment of irrigation include:

- Trail heads and urban nodes located in prominent civic settings;
- Where the trail parallels a city street that has an irrigated landscape theme.

An automatic irrigation system can include overhead spray heads, bubblers or a drip irrigation system. Spray and bubblers are typically used in densely landscaped areas because they distribute large quantities of water. Drip irrigation is success.f.ul in delivering controlled quantities of water to individual plant roots making it difficult for weeds to establish and reducing the potential for soil erosion.

For the purposes of planting appropriate vegetation that will have the best chance to thrive in the land along the 44-mile trail can be generally defined within one of the following three categories:

- *Urban Nodes;*
- *Community Landscape Zone; or*
- *California Native Landscape.*

- *Urban Nodes* are points along the trail that are within a more densely populated or developed commercial area. This includes areas that are active with a variety of pedestrians, motorists, transit riders and bicyclists, such as the train stations. These may be high priority areas for investing in a permanent irrigation system, with larger specimen trees, shrubs and ground cover planted densely to establish the presence of the Coastal Rail Trail within the heart of each community.

  The urban environment takes on the challenge of organization. Our built environments contain regular patterns reacting with elements of surprise. The urban trail landscape should capitalize on these notions, evoking visual interest and intrigue. Vegetation should be composed of masses of a species type in geometric patterns. Trees and accent planting should present the regularity of repetition. Appropriate plant species may include those that require additional maintenance and water, or be exotic in origin.

- *Community Landscape Zone*. The longest portions of the trail pass through areas that are partially developed or are generally industrial. In these settings the individual identity of the community should be reflected in the vegetation. The trail then acts as a link to these dependent, yet individual bodies. Cities and communities bring local influence to their respective trail sections. The trail is often too far from a water source to provide affordable irrigation. Certain sites may be selected to be furnished with an automatic irrigation system. Local civic groups or business sponsors may finance this type of system. An alternative irrigation method, which should be considered, for plant establishment includes using a water truck along the trail on a regular basis. The plant palette for these areas includes hardy natives and drought tolerant exotic species that will ultimately require minimal or no supplemental irrigation.

  Trees must be carefully located to not negatively impact views established on adjacent private property nor to impact rail service. Trees should serve to shade points along the trail, mark its path across a landscape and contribute to the character of the community that the trail passes through. Fragments of native plant groups exist, but now compete with exotic-invasive species. Generally, clearing out non-natives and replanting native vegetation should restore these native remnants.

The project's overall success depends on the input by local communities. Support should be sought from the citizens and businesses to contribute for landscape improvements such as additional planting, irrigation, kiosks, trail stations, or site furnishings. Adopt-a-Tree programs have been success.f.ul in many communities, which can reduce costs associated with landscaping improvements and maintenance. These additional improvements to the trail landscape will enhance the community as a whole.

- *California Native Landscape Zone*. The trail runs through expanses of native habitat including coastal bluffs, riparian, and inland coastal sage scrub. These areas are descriptive of the local cultural geography, geology, and plant and animal habitats. Wildlife depends on these open spaces as valuable habitat. The trail will introduce the historic vegetation patterns and indigenous species to the trail user.

  Strictly native vegetation species should be established in these areas. In respect of their natural growing cycles, these species are typically seeded in the late fall at the onset of the rainy season. Planting within native habitat areas may require other species, in addition to the natives identified in the Plant Matrix, to comply with site specific restoration goals. Generally, planting should only be added to disturbed areas, or to replace exotic-invasive species. Public groups, including garden and wildlife clubs, may provide valuable planting and long-term care assistance.

  With native planting, particularly hydro-seeded areas, it is critical to observe seasonal planting windows to match available rainfall with the specific requirements of the seed. Temporary irrigation in these areas may also be valuable to assist in plant establishment. Drip irrigation may prove to be the most efficient temporary irrigation for container plants.

Each of the cooperating jurisdictions' current landscape and irrigation guidelines and standards and the California Department of Forestry Standards should be used as a reference in determining product type, installation method and plant care.

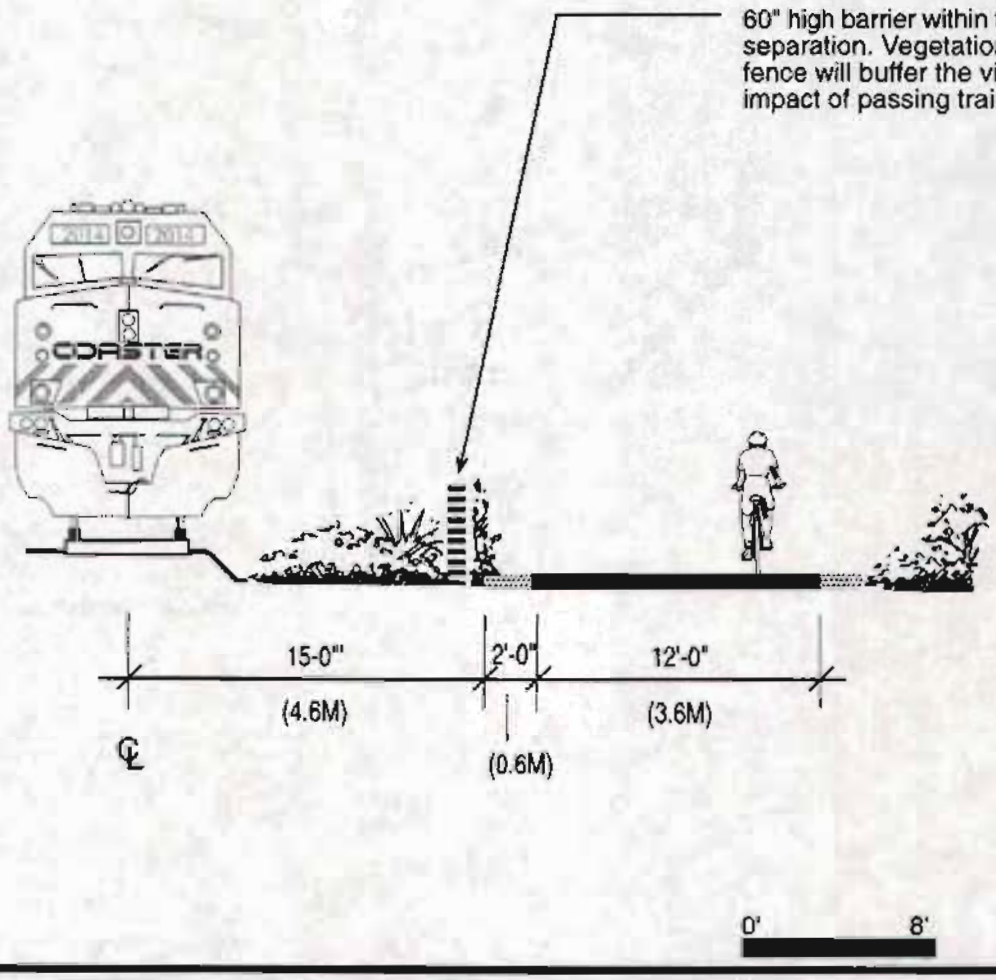


FIGURE 8.1	CONSTRAINED SECTION Separation: horizontal = 15'	COASTAL RAIL TRAIL

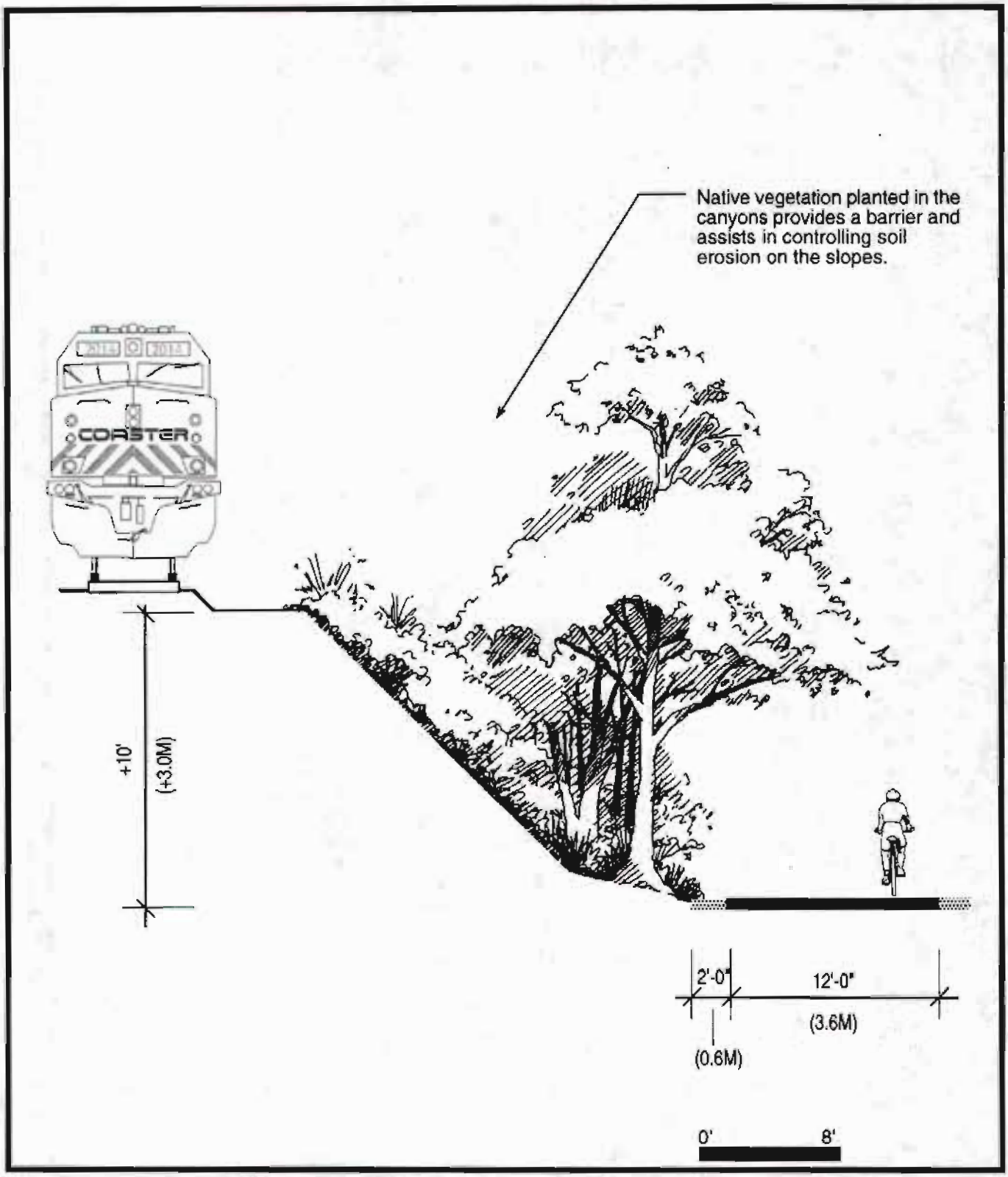


FIGURE 8.2	**UNCONSTRAINED SECTION** **Separation: vertical = +10'** **horizontal = + 20'.**	COASTAL RAIL TRAIL

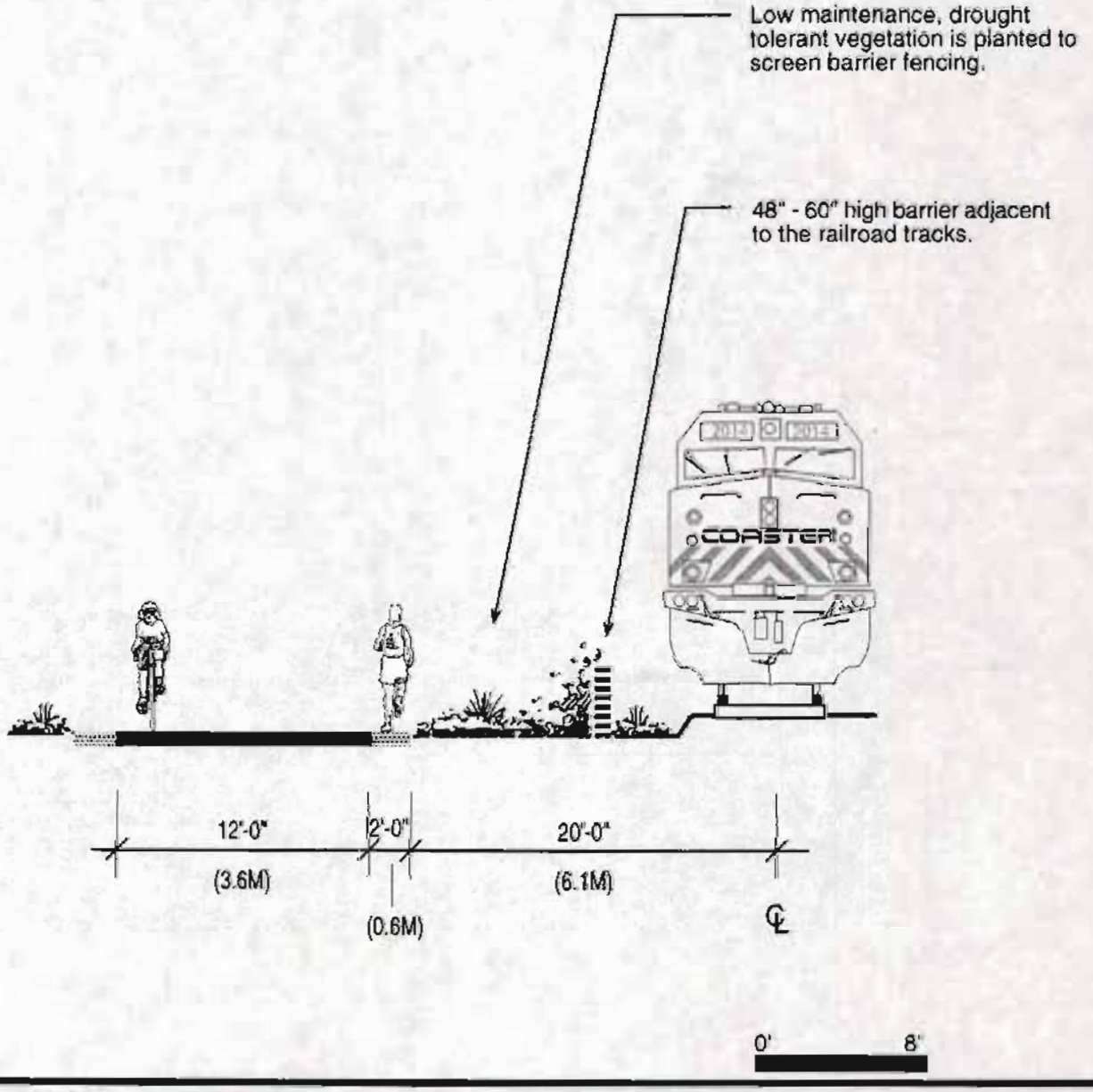


FIGURE 8.3	CONSTRAINED SECTION Separation: horizontal -20'	COASTAL RAIL TRAIL

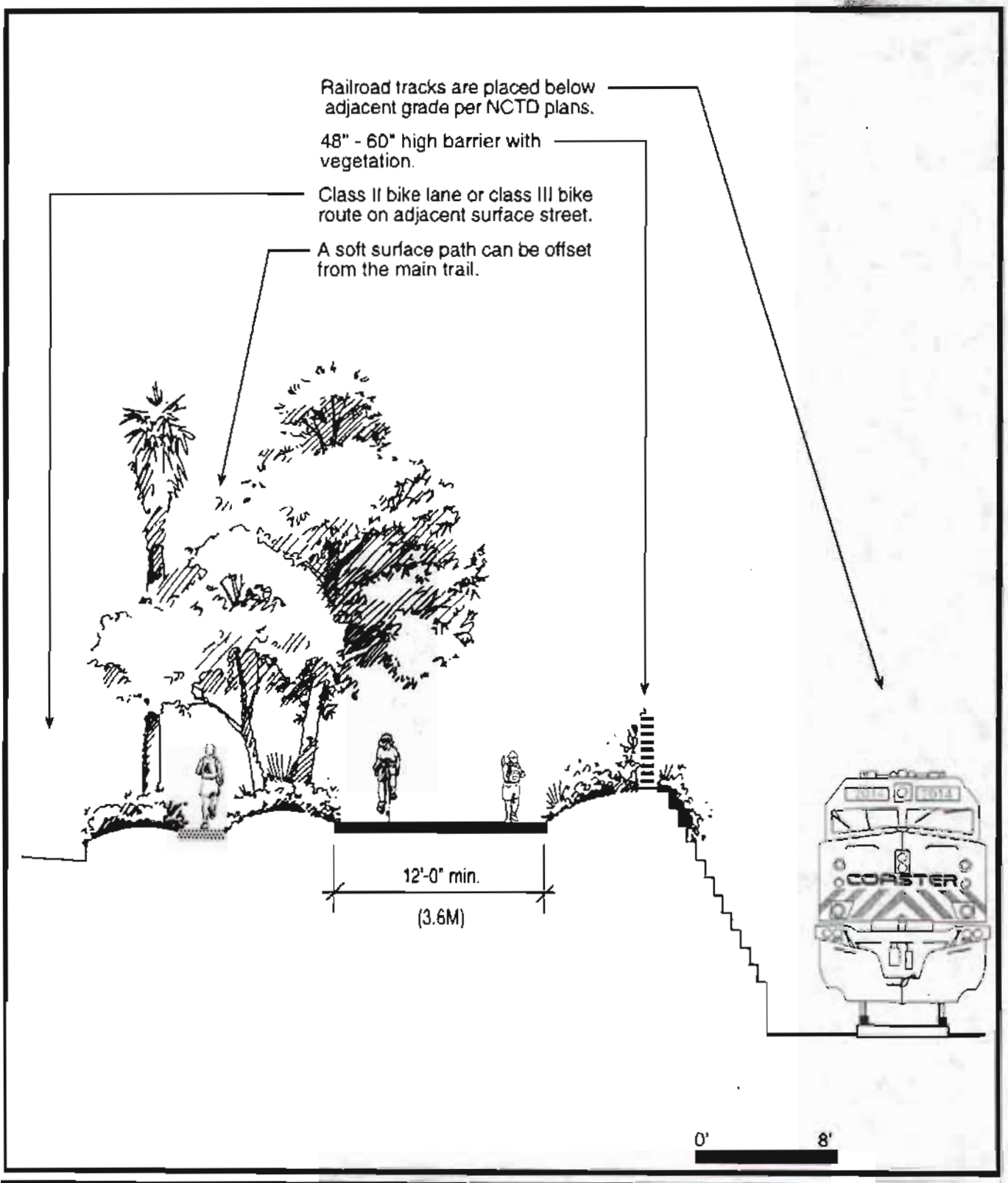


FIGURE 8.4	**UNCONSTRAINED SECTION** **Separation: vertical = +10'** **horizontal = - 20'.**	COASTAL RAIL TRAIL

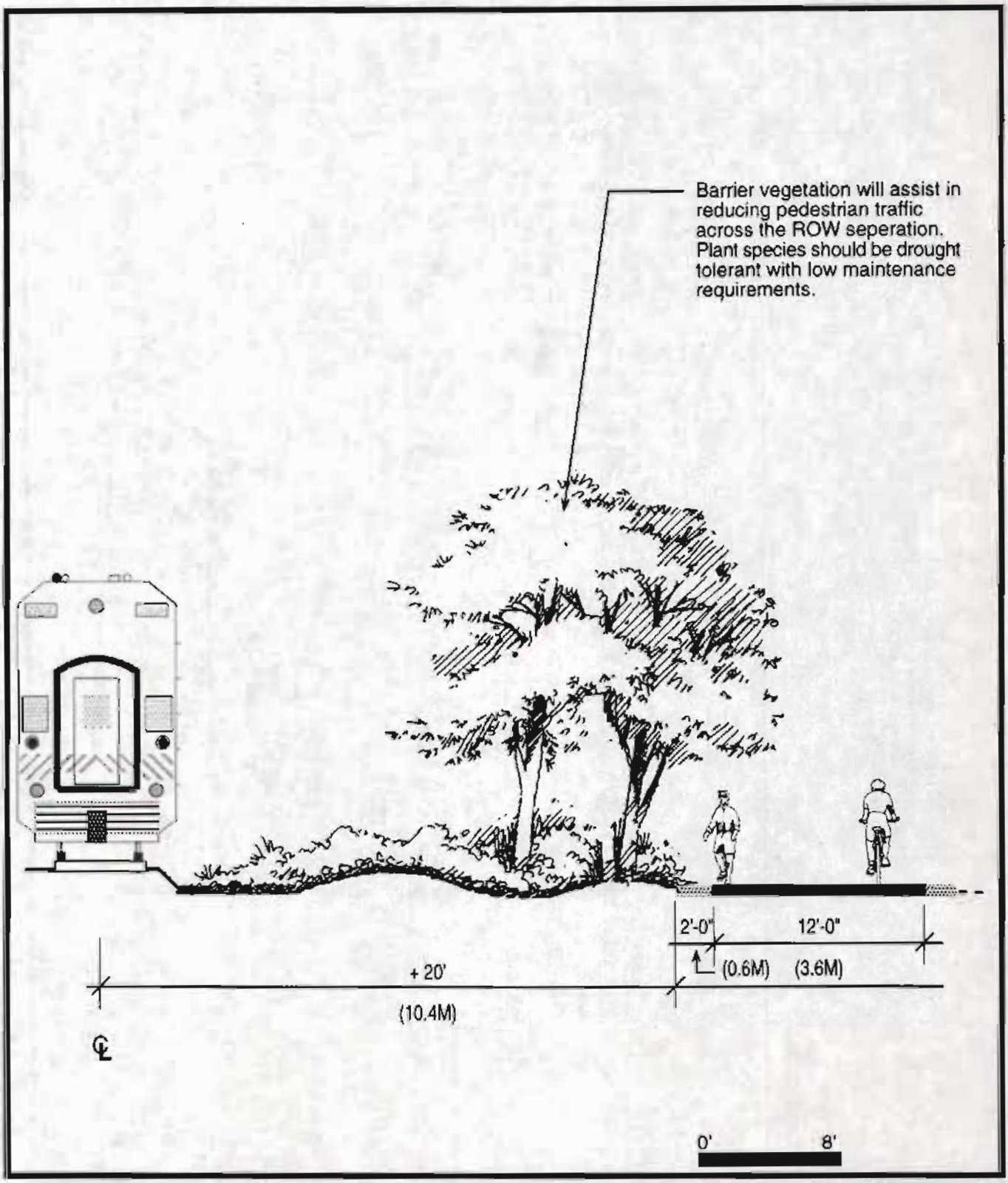


FIGURE 8.5	UNCONSTRAINED SECTION Separation: horizontal = +20'	COASTAL RAIL TRAIL

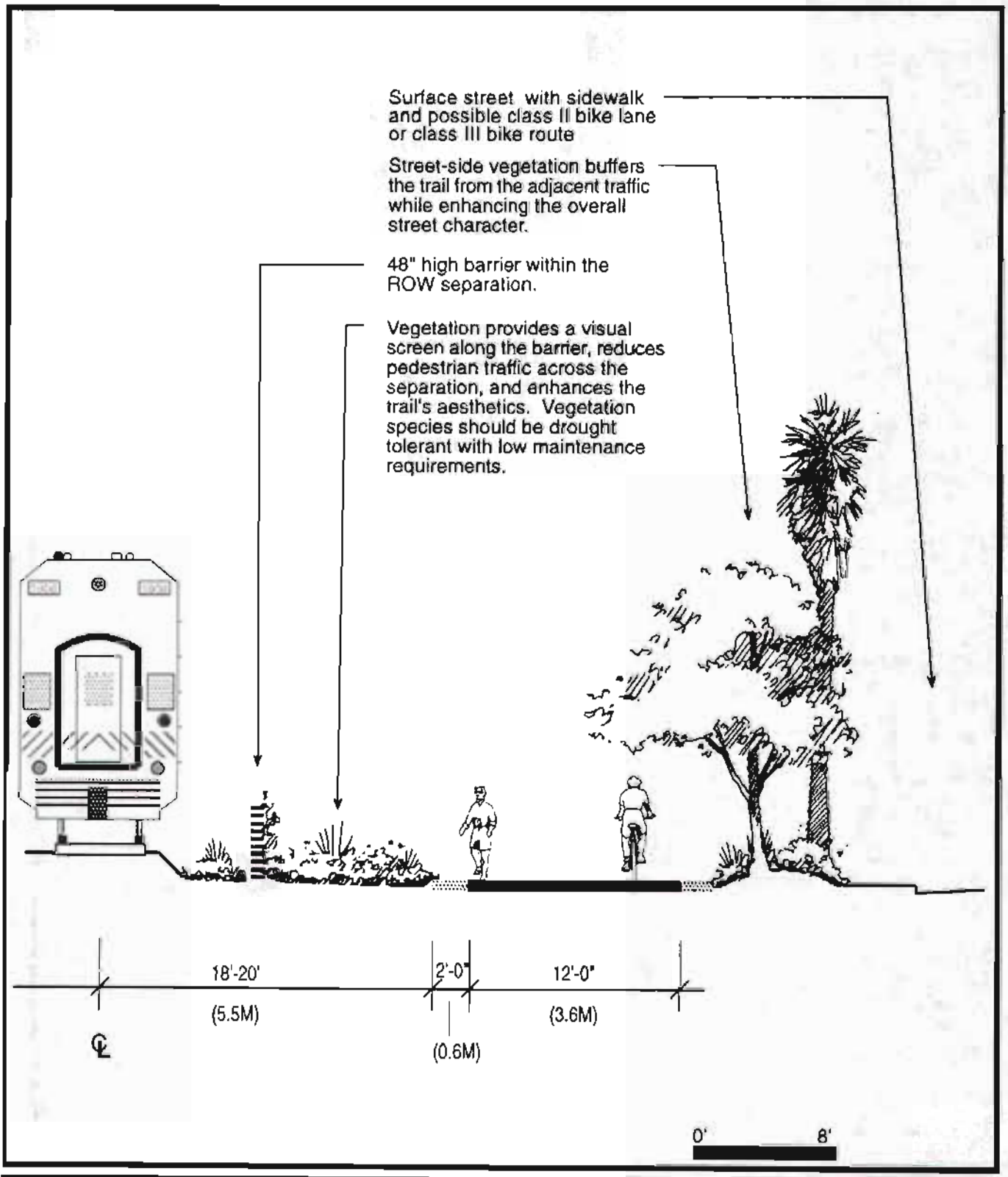
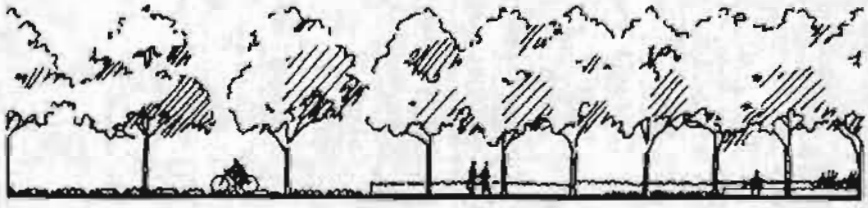


FIGURE 8.6	CONSTRAINED SECTION Separation: horizontal = -20'	COASTAL RAIL TRAIL

Levels of Intensity required for planting, irrigation, & maintenance within each vegetation zone.

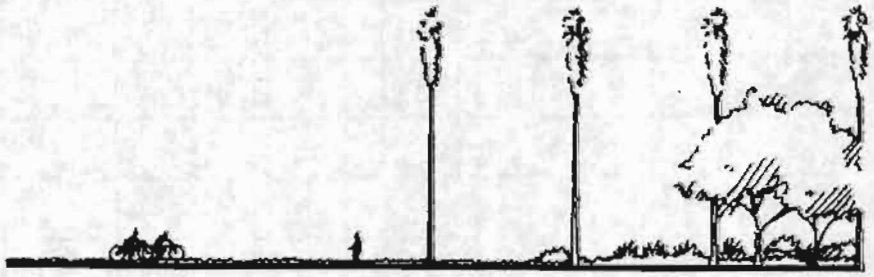
Low Intensity Transition High Intensity



The urban zone should include a permenant irrigation system; shade trees with seasonal color; shrubs and groundcover.

Urban Node

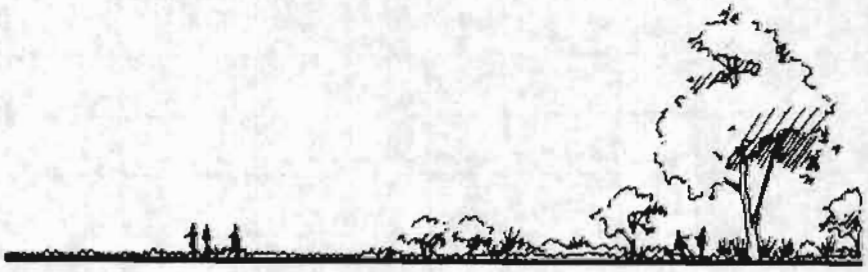
Low Intensity Transition High Intensity



The community zone may include a temporary irrigation system in high intensity areas and the use of a water truck in low intensity areas to establish shrubs and groundcover.

Community Zone

Low Intensity Transition High Intensity



The natural vegetation zone may utilize a temporary irrigation system in the high intensity areas and use a water truck in low intensity areas to establish native shrubs species.

Calif. Native Vegetation

0' 40'

FIGURE 8.7	LANDSCAPE ZONES	COASTAL RAIL TRAIL

Table 23

Trees & Shrubs

SCIENTIFIC NAME / Common Name	Plant Uses										Characteristics						Needs		
	Physical Barrier	Visual Screen	Erosion Control	Accent Planting	California Native	Coastal Planting	Inland Planting	Urban Landscape	Community Landscape	Natural Landscape	Evergreen	Seasonal Color	Fast Growing	Small size at Maturity	Medium Size	Large size at Maturity	Full Sun	Partial Shade	Irrigation Required
BRAHEA ARMATA Blue Hesper Palm				◆	◆		◆	◆	◆	◆	◆						◆		
BRAHEA EDULIS Guadalupe Palm				◆			◆	◆	◆		◆						◆		
CASSIA LEPTOPHYLLA Gold Medallion Tree								◆	◆		◆	◆	◆		◆		◆	◆	◆
CUPRESSUS FORBESII Tecate Cypress					◆		◆		◆	◆	◆		◆		◆		◆	◆	
DRACAENA DRACO Dragon Tree				◆		◆		◆			◆			◆			◆	◆	
EUCALYPTUS CITRIODORA Lemon Scented Gum		◆		◆		◆	◆		◆		◆		◆			◆	◆	◆	
EUCALYPTUS POLYANTHEMOS Silver Dollar Gum		◆		◆		◆	◆		◆		◆		◆			◆	◆	◆	
JACARANDA MIMOSIFOLIA Jacaranda		◆		◆			◆	◆				◆			◆		◆		◆
JUNIPERUS CHINENSIS 'TOROLUS' Hollywood Juniper		◆		◆		◆	◆	◆	◆		◆		◆		◆		◆	◆	◆
KOELREUTERIA PANICULATA Golden Rain Tree				◆			◆	◆			◆			◆			◆		◆
LEPTOSPERMUM LAEVIGATUM Australian Tea Tree		◆		◆		◆	◆	◆	◆		◆	◆		◆			◆		◆
LEPTOSPERMUM SCOPARIUM New Zealand Tree Tree		◆		◆		◆	◆	◆	◆		◆	◆		◆			◆		
LYONOTHAMNUS FLORIBUNDUS Catalina Ironwood			◆		◆					◆	◆	◆			◆		◆		
PHOENIX CANARIENSIS Canary Island Date Palm			◆			◆	◆	◆	◆		◆				◆		◆		
PINUS HALEPENSIS Aleppo Pine		◆		◆		◆	◆	◆	◆		◆						◆		◆
PINUS PINEA Italian Stone Pine		◆		◆		◆	◆	◆			◆				◆		◆	◆	◆
PINUS TORREYANA Torrey Pine		◆			◆	◆		◆	◆	◆	◆		◆			◆	◆		
PLATANUS RACEMOSA California Sycamore				◆	◆	◆	◆	◆		◆						◆	◆		
QUERCUS AGRIFOLIA Coast Live Oak				◆	◆		◆	◆		◆	◆					◆	◆		
TIPUANA TIPU Tipu Tree				◆			◆	◆			◆		◆		◆		◆		◆
WASHINGTONIA ROBUSTA Mexican Fan Palm		◆		◆	◆	◆	◆	◆	◆	◆	◆		◆			◆	◆		

Table 23, pg 2

Trees & Shrubs

SCIENTIFIC NAME Common Name	Plant Uses										Characteristics							Needs		
	Physical Barrier	Visual Screen	Erosion Control	Accent Planting	California Native	Coastal Planting	Inland Planting	Urban Landscape	Community Landscape	California Native	Evergreen	Seasonal Color	Fast Growing	Small size at Maturity	Medium Size	Large size at Maturity	Full Sun	Partial Shade	Irrigation Required
AGAVE AMERICANA Century Plant	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆				◆		◆	◆	
ALOE SPP. Aloe	◆	◆		◆		◆	◆	◆	◆		◆	◆	◆	◆			◆		
ALYOGYNE HUEGELII Blue Hibiscus				◆		◆	◆	◆											◆
ARTEMESIA CALIFORNICA Coastal Sagebrush	◆	◆	◆		◆	◆	◆		◆	◆	◆	◆	◆		◆		◆		
ATRIPLEX LENTIFORMIS SPP. BREWERI Coastal Qual Bush			◆		◆	◆			◆	◆	◆		◆		◆		◆		
CARISSA MACROCARPA Natal Plum	◆					◆	◆	◆			◆			◆			◆	◆	◆
CEANOTHUS 'JOYCE COULTER' Ceanothus		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆			◆		
COREOPSIS MARITIMA Sea Dahalia			◆	◆	◆	◆		◆	◆	◆		◆	◆		◆		◆		
DENDROMECON HARFORDII Channel Island Bush Poppy			◆	◆	◆	◆		◆	◆	◆		◆	◆		◆		◆		
DIPLACUS PUNICEUS Coast Monkey Flower			◆	◆	◆	◆		◆	◆	◆		◆	◆		◆		◆		
DODONAEA VISCOSA Hopseed Bush		◆				◆		◆			◆		◆			◆	◆	◆	◆
ECHIUM PASTUOSUM Pride of Madeira	◆			◆		◆	◆	◆	◆			◆		◆			◆		◆
ENCELIA CALIFORNICA Bush Sunflower			◆	◆	◆	◆		◆	◆	◆		◆	◆	◆			◆		
EREMOCARPUS SETIGERUS Dove Weed	◆		◆		◆	◆	◆		◆	◆			◆		◆		◆		
ERIOGONUM FASCICULATUM California Buchwheat	◆		◆		◆	◆	◆	◆	◆	◆		◆	◆		◆		◆		
GNAPHALIUM CALIFORNICUM California Everlasting			◆		◆	◆			◆	◆		◆	◆	◆			◆		
HETEROMELES ARBUTIFOLIA Toyon		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆					◆	◆	◆	
HIBISCUS ROSA-SINENSIS Hibiscus		◆		◆		◆		◆			◆	◆				◆	◆	◆	◆
KNIPHOFIA UVARIA Red-hot Poker	◆			◆		◆	◆	◆	◆		◆	◆	◆	◆			◆	◆	◆
LIGUSTRUM OVALIFOLIUM California Privet		◆			◆	◆	◆	◆		◆	◆		◆			◆	◆	◆	◆

Table 23, pg. 3

Trees & Shrubs

SCIENTIFIC NAME / Common Name	Plant Uses										Characteristics						Needs		
	Physical Barrier	Visual Screen	Erosion Control	Accent Planting	California Native	Coastal Planting	Inland Planting	Urban Landscape	Community Landscape	California Native	Evergreen	Seasonal Color	Fast Growing	Small size at Maturity	Medium Size	Large size at Maturity	Full Sun	Partial Shade	Irrigation Required
MALOSMA LAURINA Laurel Sumac	◆	◆	◆		◆	◆		◆	◆	◆	◆	◆	◆		◆		◆		
OENOTHERA CHERIANTHEFOLIA Beach Evening Primrose			◆		◆	◆	◆		◆	◆	◆	◆	◆	◆			◆		
PHORMIUM TENAX 'RUBRUM' New Zealand Flax	◆	◆		◆		◆		◆			◆		◆		◆		◆	◆	◆
PRUNUS LYONII Catalina Cherri						◆	◆				◆					◆			
ROMNEYA COULTERI Matilija Poppy			◆	◆	◆		◆		◆	◆		◆	◆		◆		◆		
RHAMNUS CALIFORNICA California Coffeeberry	◆	◆	◆		◆	◆	◆			◆	◆	◆	◆		◆		◆		
RHUS INTEGRIFOLIA Lemonade Berry	◆	◆	◆		◆	◆	◆			◆	◆	◆	◆		◆		◆		
RIBES SPECIOSUM Fuchsia-flowering Gooseberry	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆		◆			◆	◆	
RIBES VIBURNIFOLIUM Catalina Current	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆		◆			◆	◆	
ROSA BANKSIAE Lady Banks' Rose	◆	◆	◆	◆			◆	◆			◆	◆		◆			◆	◆	◆
SALVIA MELLIFERA Black Sage	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆		◆		◆		◆		
STRELITZIA REGINAE Bird of Paradise				◆				◆			◆	◆	◆	◆			◆	◆	◆
XYLOCOCCUS BICOLOR Mission Manzanita	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆		◆		◆	◆	

Table 24

Groundcovers & Vines

SCIENTIFIC NAME / Common Name	Plant Uses									Characteristics						Needs		
	Physical Barrier	Visual Screen	Erosion Control	Accent Planting	California Native	Coastal Planting	Inland Planting	Urban Landscape	Community Landscape	Evergreen	Seasonal Color	Fast Growing	Small size at Maturity	Medium Size	Large size at Maturity	Full Sun	Partial Shade	Irrigation Required
ACHNATHERUM CORONATUM Giant Needle Grass		◆	◆		◆	◆	◆		◆		◆	◆		◆		◆		
ARCTOSTAPHYLOS 'EMERALD CARPE' Bearberry	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆			◆		
BACCHARIS PILULARIS Coyote Brush			◆	◆	◆	◆	◆	◆	◆	◆				◆		◆		
BOUGAINVILLEA 'SAN DIEGO RED' Bougainvillea	◆	◆		◆		◆	◆	◆	◆	◆	◆	◆			◆		◆	◆
CEANOTHUS GRISEUS HORIZONTALIS Creeping Ceanothus	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆		◆		
CLYTOSTOMA CALLISTEGIOIDES Violet Trumpet Vine		◆					◆	◆		◆	◆					◆	◆	◆
ELYMUS CONDENSATUS Giant Wildrye			◆		◆	◆	◆	◆	◆			◆		◆		◆		
LANTANA MONTEVIDENSIS Common Lantana				◆		◆	◆	◆		◆	◆	◆		◆		◆		◆
LONICERA JAPONICA 'HALLIANA' Hall's Honeysuckle		◆					◆			◆	◆	◆		◆		◆	◆	◆
LOTUS SCOPARIUS Deerweed			◆		◆	◆	◆		◆		◆	◆	◆			◆		
LUPINUS BICOLOR Lupine			◆	◆	◆	◆	◆	◆	◆		◆	◆	◆			◆		
MYOPORUM PARVIFOLIUM Prostrate Myoporum	◆	◆	◆			◆	◆	◆	◆	◆		◆		◆		◆		
MUHLENBERGIA RIGENS Deergrass			◆		◆	◆	◆		◆	◆	◆	◆		◆		◆	◆	
NASSELLA LEPIDA Foothill Needlegrass			◆		◆	◆	◆		◆	◆	◆	◆		◆		◆	◆	
PARTHENOCISSUS TRICUSPIDATA Boston Ivy		◆	◆	◆			◆	◆			◆	◆		◆		◆	◆	◆
POLYGONUM AUBERTII Silver Lace Vine	◆	◆		◆			◆	◆	◆	◆	◆	◆		◆		◆		◆
ROSMARINUS OFFICINALIS 'PROSTRATUS' Creeping Rosemary	◆		◆	◆		◆	◆	◆	◆	◆	◆	◆		◆		◆		◆
SALIVIA SONOMENSIS Creeping Sage	◆		◆		◆		◆	◆			◆			◆			◆	◆
SOLLYA HETROPHYLLA Australian Bluebell Creeper			◆	◆			◆	◆		◆	◆		◆			◆	◆	◆
TECOMARIA CAPENSIS Cape Honeysuckle	◆	◆		◆			◆	◆	◆	◆	◆	◆		◆		◆		◆
TRACHELOSPERMUM JASMINOIDES Star Jasmine	◆	◆		◆			◆	◆	◆	◆	◆	◆		◆		◆		◆
VINCA MINOR Dwarf Periwinkle			◆	◆			◆	◆		◆	◆	◆		◆		◆		◆

9.0 Liability of Rails with Trails

The issue of liability has been an extremely important topic during the development of this report. In an effort to address all of the issues related to liability, the national organization, the Rails to Trails Conservancy was requested to provide a report addressing liability based on their expertise and experience related to rails with trails. A report was prepared by the attorney for the Rails to Trails Conservancy and presented at a public workshop on October 25, 1996. Over 75 individuals representing 24 public agencies and several local interest groups were in attendance. The report, since revised to address comments received at that public workshop, is presented in this chapter. Responses to specific questions are included in Appendix D.

9.1 Preface

Liability issues have become increasingly important to local agencies that develop and maintain public facilities such as schools, parks, trails, and roads. The increased incidence of lawsuits coming from injuries or death sustained on public property has caused concern among many local agencies, most of which are self-insured. Of particular concern have been the large dollar amounts that have been sought from public agencies for both actual medical costs and punitive damages. It is apparent by the number of success.f.ul lawsuits against government agencies that traditional governmental immunity is being diluted. The adoption of comparative negligence (assigning proportional responsibility) and general trend towards victim compensation by the party most able to pay for those costs, regardless of fault, is of concern to most government agencies today.

The purpose of this chapter is to assist the six local jurisdictions who are responsible for managing and developing the Coastal Rail Trail by identifying (a) what the typical liabilities are of any public facility, (b) how other bikeway and greenways, around the country, have dealt with liability, and (c) California law and how it relates to liability exposure for the trail manager, railroad, and adjacent property owners. The intent of the document is to assess the liability exposure of the agencies, and what steps have proven effective elsewhere to minimize that exposure.

Existing Rail trails

According to the Rails-to-Trails Conservancy (RTC), as of 1997, there were at least 37 active "rails-with-trails" in the United States. These facilities represent an important resource in evaluating the operations, design, and overall success of trails along active railroads, and serve as a baseline with which to measure the Coastal Rail Trail. A summary of conditions on the 37 trails surveyed by the RTC is presented below:

- Average length is 8.1 miles.
- A majority (75%) is in urban or suburban terrain.
- A railroad right-of-way no more than 100 feet wide (73%).
- A trail width between 8 and 10 feet (68%).

- Minimum distance from trail to tracks 12 feet or less (17%).
- Minimum distance from trail to tracks 20 feet or less (38%).
- Barrier between tracks and trail (70%).
- Vegetation is the most popular barrier type (32%).
- Trails cross active tracks (49%).
- Adjacent railroad is a Class I (mainline) facility (65%).
- Railroad did not oppose new trail (91%).
- At least 12 trains per day (28%).
- Trail is self-insured against liability (65%).
- Trail agency does not indemnify railroad against liability (84%).
- Number of trails with accidents as direct result of adjacent railroad (3%).
- Trails where claims have been filed against railroad (0%).
- Railroad maintenance does not infringe on trail corridor (78%).
- Trails which are fully or partially on easements (53%).

A review of this summary information reveals, among many things, that liability and safety are not major concerns on the 37 rails-with-trails surveyed by RTC. Only one fatality related to the trail being adjacent to a railroad was reported in the survey, which as stated previously, involved a bicyclist ignoring bells, flashing lights and riding around lowered crossing gates at a grade crossing next to the trail. Given that the 37 trails had about 9.2 million annual users, the resultant accident rate is less than significant. The proposed design of the Coastal Rail Trail falls within the broad range of existing rail trail designs currently in use today.

Of the 37 rails-with-trails surveyed by the RTC, four are in California (Fillmore Trail, Rose Canyon, Irvine/Santa Fe, and Garden Grove Boulevard). Of these, the Irvine/Santa Fe Rail trail is the most similar to the proposed Rail trail, being located on the same mainline and experiencing approximately the same number of trains. The Irvine/Santa Fe Rail trail runs from Sand Canyon Avenue to Peter's Canyon Trail (a total of 3.34 miles), and provides direct access to the regional trail system and major destinations such as the El Toro U.S. Marine Corps Air Station, Tustin U.S. Marine Corps Air Station, and the Irvine MetroLink Station.

The Irvine/Santa Fe Rail trail is a 10-foot wide multi-use trail, located approximately a minimum of 25 feet from the mainline tracks and is bordered by a 6' high fence located between the trail and tracks, for most of the trail, and has at-grade crossings at major roads.

As of September 1996, at least four additional rails-with-trails were being planned in California including several comparable facilities. For example, a 27-mile rail trail is being planned alongside the CalTrain commuter rail corridor in San Mateo County, which experiences in excess of 50 trains per day. The planned rail trail will be located as close as 12 feet from the active railroad tracks. There is an attempt to coordinate planning and design of these facilities to a consistent set of standards that meet the approval of CalTrans, the Public Utilities Commission, and other relevant agencies. The City of San Clemente has completed preliminary design and environmental assessment for a rail trail

bordering the beach.

The Coastal Rail Trail will be designed to handle multiple non-motorized users, including pedestrians, in-line skaters, and bicyclists. Trail design (width, shoulders drainage, gradients, horizontal and vertical alignment, etc.) will be in accordance with CalTrans guidance for bicycle facilities, and will be supplemented by design features from rail trails around the country, as appropriate (See Chapter 6). The trail will include all of the recommended federal and state signing and marking standards, and appropriate crossing treatments (sign, barrier, signal, or grade-separation) depending on the average daily traffic at the intersection (See Chapter 7).

Liability of the Six Cities as Trail Managers

Since the trail managers will be governmental entities either individually or jointly under an agreement such as a Joint Powers Agreement, their liability will depend on the extent to which their liability is shielded or limited by the Governmental Tort Claims Act, Cal. Govt. Code § 810 to 996.6, which establishes both governmental liability and immunity for tortuous acts. In general, this Act provides that a public entity may be liable for injuries caused by a dangerous condition of its property (Gov. Code § 835).[28]

However, there are exceptions, which provide for absolute liability in cases where the injury is caused by the condition of any trail or the natural condition of unimproved public property (Cal. Govt. Code, § 831.4). California law also provides that public entities will not be liable "to any person who participates in a hazardous recreational activity, including any person who assists the participant, for any damage or injury to property or persons arising out of that hazardous recreational activity." Cal. Gov. Code, § 831.7(a).

The following scenarios are likely to expose the cities to potential liability unless some sort of statutory immunity applies:

- injuries caused by defects or conditions on the trail;
- injuries caused by conditions on adjacent property, including the active railroad;
- Injuries resulting from conflicts among users or at trail/street crossings.

9.2 Immunities Available Based on Recreational Use

Immunity for Defects on Trail

To the extent the rail trail is used by recreationists, the California Tort Claims Act

[28] For the purposes of these statutes, a "public entity" includes the state, the Regents of the University of California, a county, city, district, public authority, public agency, and any other political subdivision or public corporation in the state. Cal. Gov. Code § 811.2 (Deering 1986). "Public property" is correspondingly defined to include any real or personal property owned or controlled by a public entity, but does not include easements, encroachments and other types of property tax that are located in public property but are not owned or controlled by the public entity in question. Cal. Govt. Code § 8308 (Deering 1986).

provides that "a public entity . . . is not liable for an injury caused by a condition of: (a) any unpaved trail which provides access to specified recreational purposes, including "fishing, hunting, camping, riding, water sports, and recreational or scenic areas if such road is not considered a street or highway under the supervision of a governmental entity," (b) "any trail used for the above purposes," or (c) "any paved trail, walkway, path or sidewalk on an easement of way which has been granted to a public entity, which easement provides access to any unimproved property." Id. § 831.4.[29]

Because the rail trail will be paved, subdivision (b) of Section 831.4 is the applicable provision providing for governmental immunity in the case of trail users who are injured by a condition on the trail. This immunity is absolute, and does not contain the limitation applicable to easements in subdivision (c), under which the government will be held liable if it fails to post adequate warnings of dangerous conditions. However, this immunity will probably not be available in the event injuries are caused by failure to manage conflict between users, since this would not be considered a "condition of the trail."

The courts have held that the immunity granted under subdivision (b) relating to paved trails applies to trails being used for the recreation purposes enumerated in the previous section, regardless of whether they provide access to anything or not. See Giannuzzi v. California, 21 Cal.Rptr.2d 335 (Cal. App. 1 Dist. 1993); Armenio v. County of San Mateo, 33 Cal.Rptr.2d 631, 634 (Cal.App. 1 Dist. 1994). In addition, the courts have held that the term "any trail" used within the statute makes the nature of the trail's surface irrelevant to the question of whether immunity is applicable to the public entity that owns the trail. Armenio v. County of San Mateo, 33 Cal.Rptr.2d at 634

One issue that is not resolved on the face of the statute or by case law is whether the statutory immunity will be available to persons who are not using the trail for recreation purposes, such as commuters. While the answer is not entirely clear, the thrust of the statute is to accord immunity based on the purpose of the trail itself rather than the purpose of any one particular person in using the trail. For example, the statute includes riding among the recreational uses, but does not expressly state that such riding must be recreational in nature. Thus, the intention would be to protect trails that are used primarily for recreational purposes, as distinct from trails that might primarily be used for a utilitarian purpose, such as an unpaved service or utility access road, or a street or highway.

To date, California courts have not asserted the proposition that a trail subject to § 831.4 would completely lose immunity if it were demonstrated that non-recreational users also utilized the trail. To the contrary, in Delta Farms Reclamation District No. 2028 v. Superior Court of San Joaquin County, 33 Cal.3d 699, 709 (Cal. 1983) the Court distinguished § 831.4 from California's Recreational Use Statute (§ 846), noting that:

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[29] In addition, the legislature recently amended the Civil Code to provide that a public entity that permits the public to use its property "for purposes of recreational trail use" is entitled to recover the attorneys fees (up to $25,000) if the public entity prevails or the suit is dismissed without any payment from the public entity. Cal. Govt. code § 846.1(b).

"(T)he fact that the injured party was using the trail for a recreational purpose is immaterial and that where liability attaches in favor of a non-recreational user it will also attach in favor of the hunter, hiker, swimmer, camper, and so on."

In prohibiting the application of the Recreational Use Statute to public entities, the Court suggested that under § 831.4, if a trail is used primarily for the outlined recreational purposes (i.e., riding), the immunity applies, regardless of whether individual users (such as commuters) utilize the trail for different purposes. Id. at 709. The issue is how the trail is intended to be used. The purpose for which a trail is used is ordinarily viewed as a factual issue, but it becomes a question of law if only one conclusion is possible. See Giannuzzi v. State of California, 17 Cal.App.4th 462, 467 (App. 4 Dist. 1993), granted immunity to the state for injuries sustained by a motorcyclist in a state park because he was driving recreationally. Thus, the trail manager will be immune from liability from any trail users who are injured by some condition of the trail, only if the primary purpose of the Coastal Rail Trail is for recreation.[30]

Immunity for Hazardous Activities

As noted above, California law provides that public entities shall not be liable "to any person who participates in a hazardous recreational activity, including any person who assists the participant, for any damage or injury to property or persons arising out of that hazardous recreational activity." Cal. Gov. Code, § 831.7(a). "Hazardous activity" is specifically defined to include, among other things, animal riding, bicycle racing or jumping, rock climbing, tree rope swinging, and cross-country skiing. Id. § 831.7(b)(1). It also includes any "recreational activity conducted on property of a public entity which creates a substantial (as distinguished from a minor, trivial, or insignificant) risk of injury to a participant or a spectator." Id. § 831.7(b).

However, the trail manager may still be liable in the case where (1) the public entity failed "to guard or warn of a known dangerous condition or of another hazardous recreational activity known to the trail manager that is not reasonably assumed by the participant as inherently a part of the hazardous recreational activity out of which the damage or injury arose," (2) the injury was proximately caused by the "negligent failure of the trail manager to properly construct or maintain in good repair any structure, recreational equipment or machinery, or substantial work of improvement utilized in the hazardous recreational activity out of which the damage or injury arose," (3) where it "recklessly or with gross negligence promoted the participation in or observance of a hazardous recreational activity," or (4) otherwise engaged in "an act of gross negligence." Id. § 831.7(c).

[30] Absolute liability is also accorded to public entities in the case of injuries "caused by a natural condition of any unimproved public property, including but not limited to any natural condition of any lake, stream, bay, river, or beach." Cal. Govt. Code. § 831.2. Since the coastal Rail Trail is not likely to be considered "unimproved property," this section is unlikely to provide any significant immunities to the trail managers for injuries occurring as a result of a condition on or adjacent to the trail itself. While the Section may provide some protections in the event persons who sued the trail to gain access to the beach or injured while at the beach, that question is beyond the scope of this memorandum.

It should be noted that roller blading is one of the expected activities that is likely to occur on the trail. The statute does not specifically define "roller blading" as a "hazardous activity." Therefore, immunity would be available in that context only if roller blading could be considered a recreational activity "which creates a substantial (as distinguished from a minor, trivial, or insignificant) risk of injury to a participant or a spectator." Id. § 831.7(b). Otherwise, the general liability provisions, discussed above, will govern.

9.3 Liability for the Trail as a Highway

As noted above, absolute immunity for defects in the condition of the trail will only be available if the trail is used primarily for recreational purpose, and it "is not considered a street or highway under the supervision of a governmental entity." Cal. Gov. Code, § 831.4(b). The fact that the trail is being designed as a Class I bikeway, and is being funded with federal transportation dollars creates a possibility that the trail will be treated as a street or highway for liability purposes.

If the trail is considered as a highway for liability purposes, the public entity will be liable for the trail as it would for any public property. A public entity is liable for injuries resulting from the dangerous or defective condition of public owned property if the legislative body, board or person authorized to remedy the condition: (a) had knowledge or notice of the defective or dangerous condition and (b) for a reasonable time after acquiring knowledge or receiving notice, failed to remedy the condition or to take action reasonably necessary to protect the public against the condition (Cal. Govt. Code § 835). Although classification of the trail as a highway opens the public entity up to greater liability, the statute provides for certain limitations to that liability under specified circumstances, outlined below.

Grading or Repair of Unofficial Roads

"Neither a public entity nor a public employee is liable for any injury occurring on account of the grading or the performance of other maintenance or repair on or reconstruction or replacement of any road which has not been officially been accepted as a part of the road system under the jurisdiction of the public entity." (Cal. Govt. Code § 831.3). Although this provision does provide some immunity from liability, it only addresses specific conditions of the road and does not preclude liability resulting from natural conditions.

Design Immunity

In addition to the various possible immunities described above, the government agency responsible for the trail may be able to assert design immunity under Cal. Govt. Code § 830.6. This statute provides that neither a public entity nor a public employee is liable for an injury caused by the plan or design of construction of or improvement to public property. However, this immunity only applies to liability arising under the same chapter (Sections 830 to 840.6), thus leaving the public entity subject to liability under other

enactments, (see Law Revision Commission Comments). In addition, the public entity may still be liable for negligence independent of design.

The public agency must demonstrate three criteria in order to assert this immunity: approval, reasonableness, and causal relationship. Davis v. Cordova Recreation and Park Dist. 101 Cal.Rptr. 358, 362 (App. 3 Dist. 1972) this case granted immunity for design of lagoon that resulted in a drowning death.

First, the public entity must establish that the plan or design alleged to have caused the injury was, in fact, approved in advance by the legislative body of the public entity, or by another body or employee with discretionary authority to provide such approval (Cal. Govt. Code § 830.6). In the alternative, the agency can attempt to show that the plan or design was prepared in conformity with previously approved standards (Id. § 830.6). The courts have shown substantial deference to local governments in establishing legitimate approval. Bane v. State, 256 Cal.Rptr. 468 (App. 5 Dist. 1989), held that a traffic engineer's testimony that he approved the plan was sufficient, despite his failure to sign the plan in accordance with other regulations.

Second, the agency must convince the court that there is substantial evidence enabling a reasonable legislative body, other body, or employee to approve the design or the relevant standards (Id. § 830.6). This showing will require the agency to prove that the presentation of the design was somewhat substantial and that it gave sufficient consideration to the details of the plan. See Mozzetti v. City of Brisbane 136 Cal. Rptr. 751, 753 (App. 1 Dist. 1977), which held that city council's approval of a one page drawing of a road design without requisite details, and failure to account for changes during construction, precluded application of design immunity. Evidence that the design may in fact be defective will not eliminate immunity if the approval was still reasonable. See Compton v. City of Santee, 15 Cal.Rptr.2d 660, 662 (App. 4 Dist. 1993), which held that bridge design exceeding state and county standards in effect at the time was reasonable basis for approval despite claim of sight restriction that later caused injury. Use of recognized design standards like the ones mentioned below will help to support the inference of reasonableness.

Finally, the court will require the agency to show a causal relationship between the design or plan and the injury sustained. See Levin v. State, 194 Cal. Rptr. 223, 226 (App. 1 Dist. 1983), which held that a state's modification of a highway involving a ditch and no median divider had a causal relationship with fatal automobile accident.

In cases where the public property is no longer in conformity with the approved design or plan, the immunity continues for a reasonable period of time sufficient to allow the entity to obtain funds and carry out remedial work necessary to return the property to conformity, (Bane v. State, 256 Cal. Rptr. at 475). Notice of the non-conformity does not immediately eliminate this extension of immunity.

If the public entity is unable to repair the property because of practical impossibility or lack of funds, the immunity will remain so long as the entity makes reasonable attempts

to provide adequate warnings of the condition, (Cal. Govt. Code § 830.6). However, where a person fails to respond to such a warning, the use of the property does not in itself constitute an assumption of the risk of the particular danger, (Id. § 830.6).

Effect of Traffic Control Signals

The failure to provide regulatory traffic control signals, stop signs, yield right-of-way signs, speed restrictions signs, or distinctive roadway markings does not, itself, create a dangerous condition for purposes of Cal. Govt. Code § 835 and Cal. Govt. Code § 830.4 (Deering 1986). However, if a public entity elects to install traffic signals and thereby invites reliance on such signals, the public entity can be held liable if it thereby creates a dangerous or defective condition, (Bakity v. County of Riverside, 12 Cal.3d 24, 90 Cal. Rptr. 541 (4th Dist. 1970)).

Moreover, nothing exonerates a public entity from liability for an injury that was proximately caused by the failure to install a non-regulatory traffic control signal, sign or marking, if such a warning device was necessary to warn of a dangerous condition that endangered the safe movement of traffic and would not have been reasonably apparent to or anticipated by a person exercising due care, (Cal. Govt. Code § 830.8). Warning signs, while they do not provide for absolute immunity, induce a greater standard of care on behalf of the users of the property who have been warned of dangerous conditions. Proper trail markings and signage, including posting and enforcement of trail regulations, will be particularly important, given the diverse users of the trail (e.g., bicyclists, roller bladers, walkers, joggers, etc.), and the potential for injury resulting from user conflict. (See RTC, Trails for the 21st Century, pp. 158-99.)

9.4 Liability For Dangerous Conditions on Adjacent Property

If a trail user is injured by a dangerous condition on adjacent property (such as the railroad), liability will be governed by the general provisions of the California Tort Claims Act providing that a public entity may be liable for injuries caused by a dangerous condition of its property if the dangerous condition "created a reasonable foreseeable risk of the kind of injury which was incurred." (Cal. Govt. Code, § 835). This standard will govern regardless of whether the Coastal Rail Trail is entitled to absolute immunity as a recreational trail, since that immunity extends only to the condition of the trail itself. A dangerous condition means a condition of property that creates a substantial, rather than a minor, trivial, or insignificant, risk of injury when the property or adjacent property is used with due care in a manner that is reasonably foreseeable, (Cal. Govt. Code § 830(a) (Deering 1986)).

Whether the Railroad is a "Dangerous Condition"

One obvious issue will be whether locating a trail next to an active railroad is a "dangerous condition" that creates a foreseeable risk of injury to trail users. In general, a public entity's liability for dangerous conditions on adjacent property depends on "the proximity and juxtaposition of the dangerous condition on adjacent property." Goss v.

State of California, 82 Cal App.3d 426, 430, 147 Cal. Rptr. 110, 112 (1978), determined that the State was not liable when a truck driver fell in a hole located 53 feet off state right-of-way. For example, the California Courts have held that the government was liable for injuries sustained by a pedestrian from a protruding water pipe located on private property 12 inches from the city's property, (see Jordan v. City of Long Beach, 17 Cal. App.3d 878, 95 Cal. Rptr. 246 (1971)).

Whether the railroad is a "dangerous condition" that should be warned against depends upon the specific facts and the nature of the area in question. In Durham v. City of Los Angeles, 91 Cal. App.3d 567, 154 Cal.Rptr. 243 (1979), the court held that the City of Los Angeles was not liable when a child was injured by a train merely because the City maintained a crosswalk and street adjacent to the railroad track, with no warning or fences between the cross walk and the adjacent railroad. The Court specifically stated:

> [W]e find no duty on the political entity to erect some sort of barricade in order to maintain its street in a reasonably safe condition. Neither must the City provide supervision at that location, (91 Cal. App.3d at 576, 154 Cal.Rptr. at 248).

The Court also specifically held that the City could not be liable for failing to provide traffic control signals warning of the railroad, stating:

> As for 'appellants' contention that the City did not even post a sign to deter pedestrians from passing across the sidewalk into the graveled portion while waiting for a train to pass, the lack of regulatory traffic control signals does not produce a dangerous condition (Gov. Code § 830.4, 91 Cal. App. at 576, 154 Cal. Rptr. at 248).

Accordingly, there is no real duty to erect barriers or signs to warn trail users of the potential danger of leaving the trail and straying onto the adjacent railroad tracks. This conclusion is based on the court ruling described above.

The Liability of the Cities for Injury from other Trail Users or At-Grade Crossings

The Cities may be exposed to liability in the event that trail users are injured by other trail users or by vehicles at grade crossings unless adequate warnings or protections are utilized. Injuries resulting from the failure to manage user conflict or protect users at grade crossings would not result from a "condition of the trail" and therefore, may not be protected under the immunity conferred by Cal. Govt. Code § 841.4.

In cases where the trail crosses the railroad tracks, the railroad could be considered a "dangerous condition," and the Cities should provide appropriate warnings and barriers to warn trail users of the hazard. In Holmes v. City of Oakland, the court found that the City could be held liable when a six-year old child was playing on unguarded railroad tracks crossing a city street, near a school area, and subsequently run over by a passing

train, (67 Cal. Rptr. 197, 203 (App. 1 Dist 1968)).[31]

The Court therefore held that the City had a duty to take reasonable precautions to protect children because it was foreseeable that children would be attracted to trains and railroad cars and be injured in precisely the manner that the plaintiff was injured.

Likewise, a street containing vehicular traffic could, under some circumstances, constitute a dangerous condition, such as where the intersection is obstructed or the street is not visible due to poor site distance. The Project Study Report indicates that appropriate crossing treatment (sign, barrier, signal, and/or grade-separation) will be installed depending on the average daily traffic at the intersection. This is consistent with the best practices of other trail managers.

It is unlikely, however, that the Cities will be held liable for injuries resulting from user conflicts (i.e., roller bladers versus bicyclists versus joggers). Any resulting injuries would not be the result of a dangerous condition created by the Cities, even if the Cities could have minimized the risk of such injury by adopting or enforcing regulations to manage multiple uses. See State v. Superior Court, 39 Cal. Rptr.2d 1, 32 Cal.App.4th 325 (1995) which held that the State was not liable when an equestrian was thrown from a horse when "spooked" by mountain bicyclist since the state was not liable for a dangerous condition based on acts of third parties; Pekarek v. City of San Diego, 80 Cal. App. 9th 909, 36 Cal. Rptr. 22 (App. 4, Dist. 1994) held that the City was not liable when a child was injured by a car after making a purchase from an ice-cream truck even though the City could have acted to reduce the risk by regulating ice-cream trucks; City's obligation extended on to the street, not to the pedestrians or vehicles using the street.)

9.5 Liability of Railroad Operators/Track Owners

Since the trail managers will be absolutely immune from liability for injuries sustained by recreation users, where injury is caused by the condition of the trail, it is likely that any recreation users will opt to sue San Diego Northern Railway, the North County Transit District, or the Metropolitan Transit Development Board, for any injuries that may result from train operations. Indemnification of the railroad owner by the rail trail operator is a method currently being used by other rail trails across the nation in order for the rail owners to permit public access within the right-of-way and to limit their potential exposure to financial risk.

The liability of the railroad operators depends on the nature of the injury. Historically, however, railroads have had limited liability. Railroad tracks have been a ubiquitous part of almost every American community since the 1880's, whether it be a rusty branch line or high speed commuter rail line. In most cases, railroad corridors are not fenced by the railroad operator, and are accessible by adjacent property owners and at formal grade crossings. While crossing or walking along tracks is trespassing, enforcement has

[31] In Holmes, the railroad right-of-way was not owned by the City but was an easement granted to the railway company. Although the court found that the City retained sufficient control over the easement to make it liable, it emphasized the liability would still exist in that the railroad made the City owned adjacent property subject to a dangerous condition under the terms of the law.

traditionally been lax, in part, because of the difficulty in supervising thousands of miles of trackage.

However, the failure to fence or police a railroad has never been relied on to find liability. As one court stated:

> Many miles of railroad track run on or along streets and roads in California. To fence rights-of-way on public streets would be impractical if not an unlawful obstruction of public thoroughfares.

Joslin v. Southern Pacific Co., 189 Cal. App.2d 382, 388, 11 Ca. Rptr. 267, 270 (1961) held that the railroad was not liable when a child was injured while attempting to board a moving train.

Nor will the "attractive nuisance" doctrine likely be applied to hold railroads liable for failing to erect fences or take other precautions to protect trail users from injury from moving trains. The "attractive nuisance" doctrine provides for liability of a landowner where a child trespasser is injured by a condition that the owner knows or should know would harm children, who may not realize the risk involved. As the Court explained in Joslin, (11 Cal. Rptr. at 268-69), "To hold that railways must install child-proof fences or to police the right-of-way in order to prevent children from being attracted to moving trains would place an unreasonable if not an intolerable burden upon the possessor maintaining the condition." (Id. at 270); see also Gutirrez v. Southern Pacific Co., 174 Cal. App.2d 866, 345 P.2d 326 (Cal. App, 1959) which held that the railroad was not liable under "attractive nuisance" theory when a boy was run over while playing on the railroad right-of-way.[32]

Therefore, the train operator will not be liable if the injury occurred under these circumstances. Thus, the question is what the railroad's liability would be if a trail user is injured in some other way by a dangerous condition on the railroad tracks. Because both of the entities that are responsible for managing the railroad are governmental entities, their liability for other defects on the railroad property will be identical to the liability of the cities for dangerous conditions on adjacent property, (i.e., the government may be liable if the plaintiff is injured by a "dangerous condition" which "created a reasonable foreseeable risk of the kind of injury which was incurred." Cal. Govt. Code, § 835).

9.6 Liability of Adjacent Private Landowners for Injury Sustained by Trail User

California's Recreational Use Statute (RUS) provides that:

> An owner of any estate or any other interest in real property, whether possessory or non-possessory, owes no duty of care to keep the premises safe for entry or use by others for any recreational purposes or to give any warning of hazardous

[32] It should be noted that railroads are statutorily exempt from liability where a person is injured while getting on, or attempting to get on a moving locomotive or railroad car, without authority from the owner or the operator of the railroad. Cal. Civ. Code. §1714.7. It is unclear whether this statutory immunity applies to publicly owned railroads.

conditions, uses of, structures, or activities on such premises to persons entering for such purpose, except as provided in this section, (Cal. Civ. Code, § 846).

The RUS does not provide immunity in cases where (1) a fee or other consideration, is charged for entry, (2) the person injured has been "expressly invited" (as distinct from merely permitted) on the premises, or (3) where there is a "willful or malicious failure to guard or warn against a dangerous conditions, use, structure or activity". The exception for persons who were "expressly invited" includes "only those persons who were personally selected by the landowner" (Phillips v. United States, 590 F.2d 297, 299 (9th Cir. 1979)). Thus, the landowner's duty to the nonpaying, uninvited recreational user is, in essence that owed to a trespasser under the common law, (see Ornelas v. Randolph, 847 P.2d 560, 562 (Cal. 1993)).

It should be noted that the RUS would not be applicable to protect either the cities or the railroad operator, both of whom are public entities, since the California RUS has been determined not to be applicable to public entities, (see Delta Farms Reclamation Dist. No. 2028 v. Superior Court of San Joaquin County, 660 P.2d 1168 (Cal. 1983), cert. denied 464 U.S. 915 (1983)). However, with respect to adjacent landowners who are not public entities, the scope of the property that is subject to the RUS is very broad, and includes not just the fee owners of land used for recreational purposes, but persons having a leasehold interest in the land, (see Hubbard v. Brown, 785 P.2d 1183 (Cal. 1990) (Owner of permit to graze cattle on federal land entitled to protection by RUS)).

Nor is it relevant that the adjacent land itself is not inherently "suitable" for recreation purposes. Rather, immunity applies to any land, whether developed or undeveloped, rural or urban, so long as it was used for recreation by the plaintiff, (see Ornelas, 847 P.2d at 567 (RUS protected farmer from suit by children who were injured while playing on farm equipment)).[33] The immunity applies without regard to whether the land is fenced or barricaded.

Accordingly, the California RUS will provide immunity to any private adjacent landowners in the event any nonpaying, uninvited recreation user leaves the trail and is injured on private property.

9.7 Guidance for Minimizing Liability Exposure

Based on experiences of other jurisdictions, as well as the case law in California, trail managers are unlikely to be exposed to substantial liability from trail users. Nonetheless, liability can become a problem under several conditions. A competent risk management program for the Coastal Rail Trail will help assure that the local government is doing all that it can to protect the public from injury or harm while using the Rail Trail.

1. Use of design standards. The designers, builders, and inspectors of a facility

[33] In Ornelas, the Supreme Court of California overruled a series of cases in which the courts have held that the RUS did not protect lands that are "unsuitable for recreational use," such as construction sites (Potts v. Halsted Financial Corp. 142 Cal. App. 3d 860, 191 Cal. Rptr. 209 (1983) and an unpaved road in a development project (Winneinger v. Bear Branch Ranch, 204 Cal. App. 3d 1003. 251 Cal. Rptr. 681 (1988).

should adhere to widely accepted standards governing the design and construction of the trail. A standard of conduct includes adherence to published documents such as safety codes, standards, or guidelines, which are sponsored or issued by government agencies or voluntary associations, even though such documents lack the force and effect of law. Provisions of state laws related to transportation facilities, if mandatory, may provide the basis for a finding of negligence per se. Applicable California standards are identified in Chapter 6 and include the Uniform Building Code, and CalTrans Design Manual for Class I and II Bikeways. Other available design standards include AASHTO's Guide for the Development of Bicycle Facilities; Florida DOT's Trail Intersection Design Guidelines; Island Press's Greenways: a Guide to Planning, Design, and Development; and the Rail-to-Trails Conservancy's Trails for the 21st Century: A Planning, Design, and Management Manual for Multi-Use Trails. Careful compliance with applicable laws, regulations, route selection criteria, and design standards should greatly reduce the risk of injury to bicyclists using the bikeway, and also provide strong evidence that the agency used reasonable care.

2. *Traffic signals and warning devices.* CalTrans has adopted a Traffic Design Manual, which defines the circumstances under which traffic signals and warning devices are required. While California law limits the liability of public entities for failure to install regulatory traffic signals, signage and markings, non-regulatory warning signs must be installed where necessary to warn of a dangerous condition, such as an intersection. All signals and warning devices must be adequately maintained, so as not to invite reliance on a defective warning device.

3. *Use of professionals.* Facilities that have been reviewed and approved by unregistered or unlicensed professionals may increase liability exposure.

4. *Adhere to maintenance standards.* Maintenance practices should be consistent along the entire Coastal Rail Trail, and conform to recognized maintenance practices. The responsible maintenance agency(ies) should have a written procedure to follow to maintain all portions of the Coastal Rail Trail, including pre-existing conditions such as drain grates.

5. *Monitor conditions.* The responsible agency(ies) should have an internal mechanism to monitor and respond to actual operating conditions on the trail. This is typically done through the maintenance procedures, a record of field observations and public comments, and an annual accident analysis. Accidents should be reviewed to determine if physical conditions on the bikeway were a contributing cause.

6. *Keep written records.* Written records of all maintenance activities and procedures, responses to reports of safety hazards, and other regular activities must be recorded in order to be of use. Where a rail trail travels through numerous jurisdictions, it may make sense to have one contact person/ department responsible for the entire facility, rather than risk confusion by incidents being reported to the wrong jurisdiction. Mileposts on the route may also help maintenance and enforcement personnel respond to

problems.

7. *Correct hazards.* Trail managers should correct all hazards known by public officials in a timely fashion.

8. *Warn of known hazards.* Trail users should be warned that the trail is adjacent to an active railroad corridor and to use caution when crossing the tracks or at intersections with roadways.

9. *Insurance.* Proper insurance coverage or budgeting for self-insurance to cover potential liability will do much to alleviate concerns.

10. *Don't call it safe.* Do not make any verbal or written comments that the Coastal Rail Trail is safe or safer than a non-designated route. For example, this report makes a statement that the rail trail reduces the number of intersections bicyclists and others must use in the corridor, and that most bicycle and pedestrian-related accidents occur at intersections. However, the report does not make any blanket claims that the rail trail is safe or safer than comparable routes.

11. *Don't rush to settle.* Fear that juries will award a plaintiff large sums for damages has made many attorneys eager to settle cases before they come to court. One defender settled a case where a bicyclist was injured while riding his bicycle on the shoulder of a roadway that was not a designated bikeway. The prosecution claimed that the local government had inferred some guarantee of safety by showing the route on an official map. The map itself made no explicit guarantee of safety, but did include recommended routes for bicyclists. The defender settled the case and forced the jurisdiction to remove all bicycle maps, which is now one of the few in the state that offer no such publication. The net effect of prematurely settling a case in this instance was to arbitrarily limit the types of services that could be offered by the local government. In other cases, settling cases prematurely may simply encourage legal action by others.

9.8 Liability Conclusions

Arguably, trails alongside active railroad lines are no different than sidewalks along busy arterials. They are public facilities utilizing an existing transportation corridor. In some cases, railroad lines are crossed by informal pathways connecting community destinations that have been used by, and known about by the railroad company, for a hundred years or more. In short, if safety is judged by the volume and speed of vehicles that can injure or kill a pedestrian or bicyclist, roadways pose a far greater danger than railroads and are not considered to be an unusual safety hazard in a community.

Injuries and deaths on railroad tracks receive a disproportionate amount of press than do automobile accidents, much as airplane accidents do. The perception of safety is related to the drama of these incidents. It has also been difficult to determine the extent that deaths on railroad tracks have actually been suicides rather than accidents.

A new multi-use trail located along a railroad alignment will attract additional people to the corridor. Most of these trail users were formerly walking or riding on other trails, along roadways, or on sidewalks, and do not represent "new" users to the community. People are attracted to multi-use trails because they perceive them to be safer than riding or walking on busy streets, with intersections, driveways, parked cars, and other obstructions. The rail trail will help organize and manage the people who currently walk across or along the tracks on informal pathways, and in doing so will help lessen the number of people walking on (or crossing) the tracks.

Will a trail along an active, high-speed rail corridor encourage people to walk or play on the tracks themselves? As was mentioned, most railroad tracks are currently not fenced and have limited enforcement of trespassing laws. People seeking to engage in vandalism or other illegal activities will seek places where they will not be easily seen or caught. A multi-use trail will increase the exposure of the tracks and discourage people from engaging in illegal or unsafe activities.

10.0 Environmental Constraints Analysis

10.1 Purpose

The purpose of this chapter is to assist in the planning and alignment selection for the Coastal Rail Trail along the San Diego Northern Railway (SDNR) from the San Luis Rey River Path in Oceanside to the San Diego Santa Fe Depot. As a result of the findings presented in this chapter, the alignment was modified to address biological and cultural concerns. Additional focused studies will be prepared as part of the Environmental Assessment/ Mitigated Negative Declaration as determined by FHWA (See Section 10.13).

This section consists of:

1. The environmental documents considered for evaluation of available data on the resources affected by project implementation;

2. Collection of information from the Natural Diversity Database Records Search;

3. Discussion of the CEQA /NEPA process; and

4. Identification of data gaps and necessary field studies.

The environmental constraints analysis included a review of existing biological and cultural resource information for projects that encompass the proposed Coastal Rail Trail corridor. In this initial constraints effort, limited field reconnaissance was conducted. However, 200-scale County ortho-topo maps and site photographs were reviewed. A total of 13 EIRs and technical documents were also reviewed and are identified in the Bibliography.

The Oceanside Transit Center location, and all the other stations, are addressed in the Oceanside-San Diego Commuter Rail Project Environmental Impact Report (Coaster EIR), prepared in 1989 by RECON. The EIR evaluated the proposed railroad improvements from Oceanside to San Diego. The analysis in the EIR is limited to the impacts associated with construction of new stations and passing track improvements. Since the commuter rail service was planned to occur within the existing SDNR railroad tracks, and the proposed stations to be situated in previously disturbed developed areas, only minimum impacts were anticipated in that EIR.

The Coaster EIR analysis provides focused assessments at four locations, which include the areas for new station construction or railroad improvements. The biological and cultural field surveys were based on the likelihood of potential impacts occurring from improvements at these locations. The four areas included 1) Carlsbad Poinsettia Station, 2) the Solana Beach Station, 3) the Miramar Hills Curve Straightening Project, and 4) the Elvira Curve Straightening Project.

In addition to the Coaster EIR, each additional environmental document was evaluated based on the level of detail associated with the resource maps, the relative amount of biological and archaeological resources identified, and the length of time that had elapsed since the environmental studies were conducted. In addition to reviewing reports, biological data from the Multiple Habitat Conservation Program (MHCP) and the Multiple Species Conservation Program (MSCP) were reviewed. The data associated with the MHCP and MSCP were based on existing maps prepared at a scale of 1 inch = 2,000 feet.

10.2 Gap Analysis

A gap analysis is a process of reviewing existing relevant documents to determine where there are gaps in the existing cultural and biological information. The result of this gap analysis is included in this chapter. These gaps were identified based on the lack of data along the various alignment segments and also where the existing data was insufficient for the purposes of this project. The documents that were determined to be useful for this project are listed in Tables 25 and 26 related to biological and cultural resources.

10.3 California National Diversity Data Base Results

The California Natural Diversity Data Base (CNDDB) is an electronic catalog of sensitive plant, animal, and vegetation data that has been reported to the California Department of Fish and Game (CDFG). This data can be retrieved for any USGS quadrangle desired, and each datum has relevant information attached to it, such as the date of the sighting, the population, and the location (sometimes precise, but usually general). The CDFG has established the CNDDB as part of the California Natural Heritage Program, in an attempt to catalog and preserve the natural resources of the state. The CNDDB search was conducted for the entire alignment.

10.4 Critical Field Surveys

Field survey windows are optimum periods of time when sensitive species are known to occur. These survey windows were identified for the various sensitive species, which may occur along the proposed project corridor. These critical field surveys would only be required if the trail alignment extends through or adjacent to areas suspected to contain sensitive species.

The critical survey window for the entire project generally occurs from mid-May to the end of July for sensitive wildlife species. For sensitive plants, the critical survey windows are March through May, and August through October. Although not all of the potential sensitive species will be resident or in bloom during this period, it encompasses the ideal survey period for all of the federal and state-listed endangered and threatened species, which have the potential to occur onsite. These survey windows are summarized as part of Table 27.

10.5 Area of Potential Effect (APE)

The alignment maps, which accompany this PSR, will identify the biological and cultural areas that may be disturbed by project implementation. APE maps are subject to FHWA approval and review under Section 106.

Current species lists are required by US.F.WS for the entire alignment and field surveys can be no older than 2 years at the time FHWA approves the document.

10.6 CEQA/ NEPA Review

Mitigated Negative Declaration (CEQA)

The CEQA Guidelines, Section 15382 define "significant effect on the environment" as a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, water, flora, fauna, etc." The findings of significance are based on criteria outlined in the CEQA Guidelines, evaluation of technical data, and professional judgment and experience.

To determine the level of documentation required for state and local projects, a determination needs to be made as to the level of impacts, which may occur, with a proposed project. In the CEQA process, this determination is made through preparation of an Initial Study (IS). If it is determined that all impacts from a proposed project are less than significant or can be mitigated to below levels of significance, a negative declaration or mitigated negative declaration is then prepared as part of the initial study process. Often, a lead agency may determine to prepare an Environmental Impact Report depending on the severity of the impacts, or whether there is substantial controversy relative to environmental concerns. Certain actions, such as the construction of bicycle, pedestrian lanes, paths and facilities are often exempted from the CEQA process. In this case, a lead agency makes the determination that its proposed project will not result in any significant environmental impacts, and then prepares a Categorical Exemption. This determination can be supported by existing studies.

CEQA provides for the use of a Mitigated Negative Declaration (MND) when the potential environmental effects identified during the Initial Study Process are reduced through project modifications which eliminate significant environmental impacts or reduce them to a level of insignificance (Pub. Resources Code, § 21080, subd. (c); CEQA Guidelines, § 1500, subd. (h), 15070, subd. (b))

Under CEQA guidelines, the contents of a Negative Declaration shall include the following components:

- A brief description of the proposed project, including any commonly used name for the project;
- The location of the project and the name of the project proponent;
- A finding that the project, as proposed, will not have a significant effect on the

environment;

- An attached copy of the Initial Study with reasons supporting the findings; and
- For a MND, mitigation measures to be included in the project to avoid potentially significant effects, which must be fully enforceable through permit conditions, agreements, or other measures.

Following completion of a MND, the draft MND undergoes a thirty (30) day public review period. At the end of this 30 day period, the lead agency may elect to approve or disapprove the project.

Environmental Assessment/Finding of No Significant Impact (NEPA)

Similar to CEQA, NEPA, also exclude actions such as construction of bicycle lanes from the environmental process. Environmental clearance for actions with minimal to no environmental impacts are also subject to the issuance of categorical exemptions. The federal equivalent to the CEQA Initial Study/Mitigated Negative Declaration is the Environmental Assessment/Finding of No Significance (EA/FONSI). When a lead agency identifies significant, unmitigable impacts for a federal project, it is then required to prepare an Environmental Impact Statement (EIS).

Prior to issuance of a categorical exemption, appropriate environmental studies are sometimes required to determine: (1) level of significance, (2) if significant impacts could occur on properties protected by Section 4(f) for public parks, or Section 106 of the National Historic Preservation Act for cultural resources, or (3) if substantial controversy exists based on environmental issues.

NEPA review is required for projects receiving federal funding. The Coastal Rail Trail has received federal funds through ISTEA and is subject to NEPA. The project review is conducted by the Federal Highway Administration (FHWA) and administered by the California Department of Transportation, (CalTrans) District 12. The requirements of 36CFR800 must be met prior to public circulation of the EA/FONSI. The EA provides the basis for a finding by CalTrans that either: 1) the project is categorically excluded from NEPA, 2) the project has no significant impacts or Finding of No Significant Impact (FONSI) as identified during the Preliminary Environmental Study (PES), or 3) the project has significant impacts and requires preparation of an Environmental Impact Statement (EIS).

For purposes of the Coastal Rail Trail project, the lead agency (The City of Carlsbad) will be responsible for carrying forth the required environmental documentation process. It is the intent of the cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar and San Diego to implement development of the trail within their jurisdictions as separate and independent projects or as joint projects between two or more cities. As indicated by CalTrans, categorical exemptions may be issued to those jurisdictions with minimal environmental constraints.

Prior to issuance of a categorical exemption, the lead agency needs to demonstrate compliance with the State Historic Preservation Officer (SHPO) requirements and evidence of necessary resource permits, if required for the project.

10.7 Oceanside Alignment (See 5.1)

The Coastal Rail Trail alignment begins at the San Luis Rey River along the east side of the railway, just south of Harbor Drive in Oceanside. The trail follows the railroad through a generally disturbed area. In two areas, due to design and cost constraints the alignment shifts to surface streets. The alignment extends along an existing Class III bike route on Pacific Street for approximately three blocks to Buccaneer Beach Park. The path connects back to the railroad right-of-way under the railroad trestle. At this point, it connects to the railroad corridor by crossing under the bridge to the east side. The trail continues southerly towards Carlsbad. At Eaton Street, the trail takes surface streets across the Buena Vista Lagoon.

Biological Resources

The trail alignment avoids a potentially biologically sensitive area south of Eaton Street approaching Buena Vista Lagoon. The trail has been realigned to take surface streets rather than utilize an existing dirt path, adjacent to the Buena Vista Lagoon. Although no direct impacts were expected to the wetland habitat associated with the Buena Vista Lagoon, the proximity of the path could potentially increase human disturbances at the edge of the habitat. Based on a review of the MHCP biological maps, there is a potential for several federal and state-listed species to occur in the vicinity of the alignment, particularly along the lagoon. Among these sensitive species are the following: least Bell's vireo, light-footed clapper rail, California red-legged frog, and tidewater goby. A complete list of federal and state-listed endangered, threatened, and candidate species that have the potential to occur in the vicinity of the alignment is presented in Tables 27 and 28.

The existing biological information for the Oceanside alignment is sufficient for a majority of the current project. Two areas that do not have adequate data to determine if the project will adversely affect sensitive biological resources are located at the northern terminus of the trail alignment and the northern fringe of Buena Vista Lagoon.

A review of the California Natural Diversity Data Base (CNDDB) determined that there are at least six sensitive wildlife species that are either state or federally-listed as threatened or endangered which are historically known to occur in the vicinity of the Oceanside alignment. These six species are the least Bell's vireo, light-footed clapper rail, California red-legged frog, California gnatcatcher, Belding's savannah sparrow, and tidewater goby. Several other species with lower sensitivity status occur in the area, including the southwestern pond turtle, northern harrier, and white-tailed kite. One plant species designated as rare at the federal level, sticky dudleya, is also known to occur in the vicinity of the Oceanside alignment. Several other plant species with lower sensitivity ratings also are known to occur in the area, and are summarized as part of

Table 27.

Critical survey windows for sensitive wildlife and plant species that may potentially occur in native habitats along the two areas of this alignment generally runs from March through July. This time frame will allow surveys to be performed at the optimal time to detect the presence of the federal and state threatened or endangered species.

Wetland impacts are not expected because the trail utilizes existing roadways and bridges to traverse wetlands that coincide with the alignment. However, if it is later determined, either through field investigations or project re-design, that wetlands or waters would be affected, then a 404 permit would be needed from ACOE, water quality certification would be needed from the Regional Water Quality Control Board (RWQCB), and a Streambed Alteration Agreement would be needed from California Department of Fish & Game (CDFG) prior to any impacts to the wetlands.

Issuance of a categorical exemption may be obtained for the Oceanside segment since the potential areas of effect are limited to two small areas. Since these areas have been avoided through trail realignment or through site design measures, the impacts are minimal.

Cultural Resources

No disturbance to cultural resources is expected to occur where the trail extends along the existing Class III bike route from Pacific Street to Buccaneer Beach Park. However, potential areas of concern that may constrain trail development include the area where the proposed trail would extend along the existing SDNR right-of-way. Although the majority of the right-of-way has been disturbed by grading, the potential exists for subsurface artifacts to be located along these areas.

The cultural resources survey conducted for the Coaster EIR focused its study at the proposed station locations. The limited field surveys that were conducted for the entire length of the Coaster EIR were undertaken only in undeveloped areas. Areas where the commuter rail project area had already been graded, or were covered by existing development, were not examined for cultural resources. All survey areas covered on foot were indicated to have been inspected by walking parallel transects no farther than five meters apart. Information in the EIR and technical documents did not indicate specific archival research, locations of the field survey, or other data collection methods.

Based on the limited availability of specific information in the Coaster EIR relative to the proposed Coastal Rail Trail project, it is unknown whether the proposed trail extends through unsurveyed areas, specifically as it extends along the SDNR. These areas may contain cultural resources that would need to be addressed prior to selection of a final trail alignment.

Surveys for historic resources have been conducted in the City of Oceanside in the vicinity of the SDNR tracks to identify historic structures and buildings. While a number

of residences and small businesses dating from the 1910 era to the 1950s are located in proximity to the SDNR right-of-way, these structures are located outside of the railroad right-of-way and the proposed trail alignment. A review of Sanborn Fire Insurance Company maps indicates that prior to the 1940s, a number of structures associated with the railroad and its activities (i.e., baggage storage, oil tanks, etc.) were located within the SDNR right-of-way. It is possible that foundations or subsurface remains of these structures may be present.

Field surveys and archival studies for prehistoric and paleontological resources conducted for the Coaster commuter rail project were limited to the areas where construction of the new stations and additional tracks would occur. Therefore, although portions of the Coastal Rail Trail are located within the right-of-way, a majority of the alignment was not evaluated for prehistoric or paleontological resources in the Coaster EIR. Disturbance to these resources may occur during construction of the rail trail.

The areas identified in the final alignment should be initially surveyed for potential resources. A background records and literature search from the South Coastal Information Center is also recommended to provide location data and information to complete site form data records on all previously recorded cultural resource sites within the trail alignment.

This initial information would serve as the basis for determining the presence/absence of cultural resources. Should resources be identified, potential impacts may be avoided through trail realignment.

10.8 Carlsbad Alignment (See 5.2 & 5.3)

The portion of the Coastal Rail Trail that extends through the City of Carlsbad along the Coast Highway (Highway 101) begins at Carlsbad Boulevard at the north end of Buena Vista Lagoon. The trail accesses the right-of-way just north of the bridge at Coast Highway, crossing under Carlsbad Boulevard and connecting to the Carlsbad Village Station. The trail continues south along surface streets and then connects to the rail right-of-way at Oak Avenue. The trail crosses the Agua Hedionda Lagoon on a prefabricated bridge and proceeds southerly along east side of existing tracks, it then crosses over Avenida Encinas on a Class II bike lane along Carlsbad Boulevard to La Costa Avenue.

Environmentally constrained areas within the City of Carlsbad are generally limited to a few areas where the proposed rail trail extends adjacent to areas with mostly disturbed sensitive habitats. The trail generally follows existing roadways and the SDNR right-of-way.

The Buena Vista Lagoon Ecological Reserve contains 196 acres of coastal freshwater lagoon habitat with an elevation range of 6 to 30 feet above MSL. The Buena Vista Lagoon is the only freshwater lagoon in southern California. The construction of the bridges for I-5, Carlsbad Boulevard/Coast Highway and the tracks visually separates the lagoon into four basins, although water circulation is allowed under these structures.

Presently, the Buena Vista Lagoon Reserve is mainly used for passive recreational and educational activities.

Biological Resources

Three documents were reviewed for existing biological resources within the Carlsbad alignment. These include: 1) Coaster EIR (and technical document), 2) Batiquitos Lagoon Dredge Project EIR, and 3) Poinsettia Properties EIR. The Coaster EIR and the associated biological technical report documents the presence of sensitive biological resources, within the SDNR right-of-way, in the vicinity of the Poinsettia Station. Although the biological data presented in these documents provide background information, the information dates back to 1989. The extent of time that has passed since the study was performed make this data inadequate to evaluate the sensitive biological resources along the Carlsbad segment of the project. The second environmental document that was reviewed, the Batiquitos Lagoon Dredge Project EIR produced in 1990, provided vegetation mapping at the west end of Batiquitos Lagoon in the vicinity of the Carlsbad alignment.

The proposed Carlsbad trail alignment extends through a predominantly developed area surrounded by mixed land uses except for the area between Agua Hedionda Lagoon and the Batiquitos Lagoon. The trail extends next to two potentially sensitive areas. This includes the area along the SDNR right-of-way, where the trail extends from Palomar Airport Road approximately 5,000 feet to the south. From aerial photographs taken during 1995, this narrow corridor appears to be vegetated with disturbed coastal sage scrub. Based on the preliminary trail alignment, the trail would extend within the existing right-of-way, outside of the adjacent habitat. Measures to avoid disturbance of coastal sage scrub habitat should be considered during construction. Use of fencing to maintain trail users along the trail should also be considered to avoid human encroachment onto the coastal sage scrub habitat.

The second location that may be environmentally constrained includes the area within the SDNR right-of-way in the vicinity of the Poinsettia Station, as identified in the Coaster EIR and the proposed Poinsettia Properties residential development. Mapping in this general area documented federal and state-listed endangered plant species, San Diego button celery, as well as wetland habitat. It is currently unknown whether these sensitive plant species remain in the project vicinity since construction of Poinsettia Station began. However, based on the Poinsettia Properties EIR and supporting biological study, vernal pools have been documented along the eastern side of the railroad right-of-way and may extend within the right-of-way. Based on these documents and the existing MHCP biological data, there is a potential for the following federal or state-listed sensitive species to occur within or near the Carlsbad alignment in the vicinity of the Poinsettia Station. These include: Pacific little pocket mouse, Riverside fairy shrimp, San Diego fairy shrimp, and vernal pool fairy shrimp. The trail has been designed to avoid vernal pool areas by diverting to adjacent roadways.

Species that are known to occur in the vicinity of the Carlsbad alignment, according to

the CNDDB, include Belding's savannah sparrow and California gnatcatcher. The coastal cactus wren, a California "species of special concern," also is known to occur in the vicinity. Several sensitive plants are either known or have the potential to occur within the Carlsbad alignment. These species are presented in Table 27.

Critical survey windows for sensitive wildlife and plant species that may potentially occur in native habitats along the two areas of this alignment generally run from April through July. This time frame will allow surveys to be performed at the optimal time to detect the presence of the federal and state threatened or endangered species.

Issuance of a categorical exemption may be obtained for the Carlsbad segment since the potential areas of effect are limited to two small areas. If these areas can be avoided through trail realignment or through site design measures, then the impacts can be minimized. Should issuance of resource permits be required, early consultation should be initiated to facilitate preparation of the necessary environmental documents.

Cultural Resources

The Batiquitos Lagoon Enhancement Project EIR/EIS, prepared in 1990, addresses issues related to the project at Batiquitos Lagoon. The project area included a segment of the rail right-of-way, the area immediately adjacent to the railway, and Batiquitos Lagoon. Availability of relevant data was limited to the information provided in the EIR/EIS; no technical studies were available for information related to specific field and archival survey information, maps showing site locations, data collection techniques, or testing results. The EIR/EIS identified 14 cultural resource sites that were recorded within the immediate vicinity of the lagoon. Of these 14 sites, two were described in the text as occurring near the SDNR right-of-way; however, no maps were available in the EIR/EIS to show the location of these sites. The trail alignment avoids these sites, therefore, there are no potential of impacts identified.

The proposed rail trail extends along the right-of-way or along existing roadways. Based on a review of current aerial photographs, there are no historic resources located along the existing roadway, the railroad right-of-way, or within the lagoon area. No buildings or structures appear within the SDNR right-of-way or within the existing roadways where the rail trail would be located.

Due to the limited amount of data found in the existing documentation, it is unknown whether prehistoric or paleontological resources have been identified within the railroad right-of-way. Disturbance to these resources may occur during construction of the bike trail. These constraints are largely associated where the trail extends adjacent to the railroad right-of-way, along potentially unsurveyed areas. The proposed trail should be initially surveyed for potential resources. A background records and literature search from the South Coastal Information Center is also recommended to provide location data and site form information on all previously recorded cultural resource sites within the trail alignment

10.9 Encinitas Alignment (See 5.4 & 5.5)

The Encinitas alignment starts just south of Batiquitos Lagoon, at La Costa Avenue connecting to the west side of the railroad. The trail follows the rail right-of-way through the majority of Encinitas, except at Encinitas Boulevard and at Chesterfield Drive. The right-of-way consists of small areas of disturbed sensitive habitats. The trail generally follows existing roadways and the SDNR right-of-way. Existing vegetation includes ornamental landscaping (street trees, lawns, and eucalyptus trees).

The San Elijo Lagoon is within the City of Encinitas' jurisdiction and is 530 acres in size. The lagoon is primarily a shallow-water brackish wetland that rarely experiences tidal flows. The western portion of the lagoon is bordered by South Coast Highway 101 and the SDNR right-of-way.

Biological Resources

The Coaster EIR and the biological technical appendix were reviewed for existing biological documentation within the Encinitas segment of the project. These studies focused primarily on the new stations and minimal survey work was conducted along the railroad. Based on 1975 and 1995 aerial photograph interpretation, one potentially constrained area of disturbed coastal sage scrub, located south of La Costa Avenue, was identified. The trail alignment diverts to Class II bicycle lanes on North Coast Highway 101 to avoid any disturbance of this area. The remainder of the alignment is located within the SDNR right-of-way through predominantly developed areas.

Although no federal or state-listed sensitive species have been documented along the Encinitas trail alignment, based on MHCP data, the state-listed Belding's savannah sparrow has been identified within coastal sage scrub habitat in the vicinity of the alignment. A complete list of state and federally endangered, threatened, and candidate species that have the potential to occur in the vicinity of the alignment, such as Pacific little pocket mouse, is presented in Table 28.

The CNDDB search determined that there are two state or federally listed endangered or threatened species known to occur in the vicinity of the Encinitas alignment. These species include, Belding's savannah sparrow and California gnatcatcher. The coastal cactus wren is also of concern along this portion of the project. One state endangered plant species, Encinitas baccharis, is known to occur along this segment of the project. Table 27 summarizes the sensitive plants that are either known or have the potential to occur within the Encinitas alignment.

Critical survey windows for sensitive wildlife and plant species that may potentially occur in native habitats along the alignment generally runs from March through July. This time frame will allow surveys to be performed at the optimal time to detect the presence of the federal and state threatened or endangered species.

Issuance of a categorical exemption may be obtained for the Encinitas segment since the potential areas of effect is limited to one small area. If these areas can be avoided through trail realignment or through site design measures, then the impacts can be minimized. Should issuance of resource permits be required, early consultation should be initiated to facilitate preparation of the necessary environmental documents.

Cultural Resources

The Downtown Encinitas/North 101 Corridor Specific Plans Supplemental Environmental Impact Report was reviewed for information regarding the Encinitas alignment. This EIR addressed cultural resources within the City of Encinitas General Plan. The General Plan identified 203 historic sites within the general city boundaries. The trail will extend outside the area of historic resources. Therefore, no impacts are expected to occur.

Prehistoric resources were not addressed in the corridor document, therefore, it could not be determined if prehistoric or paleontological resources are present within the trail alignment. To determine whether segments of the proposed trail extend through areas, which may contain these resources, the City of Encinitas should conduct a visual site survey to help identify potential areas of concern. A background records and literature search are also recommended to provide location data and site form information on all previously recorded prehistoric resource sites within the trail alignment.

10.10 Solana Beach Alignment (See 5.6)

The Solana Beach alignment extends for 1.6 miles within the railroad right-of-way including an area that is being developed as part of the Lomas Santa Fe Grade Separation project. Environmental clearance for the railroad grade separation and linear park has already been completed.

Biological Resources

The environmental document for the Lomas Santa Fe Drive Grade Separation project was reviewed for existing biological information within the Solana Beach segment of the Coastal Rail Trail project. This document covered the Solana Beach alignment from San Elijo Lagoon to Via de la Valle along Highway 101. The Lomas Santa Fe Drive Grade Separation document addressed impacts associated with removal of existing trees and vegetation that would occur with implementation of the grade separation. This area coincides with the proposed Coastal Rail Trail. The grade separation project will remove most of the existing vegetation within the proposed Solana Beach alignment prior to placement of the trail. The City of Solana Beach will box and relocate 14 mature Torrey Pine trees located along the right-of-way. To date, the city has moved and relocated 176 trees that had been identified for removal. For this reason, the Solana Beach alignment would not encounter any sensitive biological areas.

Cultural Resources

The Lomas Santa Fe Cultural Resources Technical Study was available for review. Two historic sites were discovered during the field survey which were determined to not be historically significant. Both sites were determined to not be eligible for nomination to the National Register. One site, CA-SDI-1307H, was located on the northeast corner of Cedros Avenue and Lomas Santa Fe. The site consists of a paved lot with asphalt and eleven concrete foundations and pads enclosed by a chain link fence.

The cultural resources assessment was based on an archaeological record and literature search and a "visual" field survey of the Lomas Santa Fe Grade Separation project area. The archival search and field surveys did not reveal any previously recorded or new prehistoric sites within the project area.

10.11 Del Mar Alignment (See 5.7)

This segment of the alignment begins at Via de la Valle in the City of Del Mar. At this point, the corridor alignment is proposed to connect to the Class II bike lanes to the west, passing the Del Mar Race Track and Fairgrounds. The bicyclists continue on bicycle lanes on Camino del Mar through the City of Del Mar. Pedestrians proceed to Powerhouse Park where the pedestrian trail accesses the west side of the rail right-of-way. The pedestrian trail will utilize existing dirt paths along the top of the bluffs.

Biological Resources

Documents reviewed for the Del Mar alignment include the San Dieguito River Park Plan EIR, the Mid-Coast Corridor EIR and the Coaster EIR. The Coaster EIR and Mid-Coast Corridor Alternatives Analysis documents provide only intermittent coverage of biological resources along this portion of the project, generally in the vicinity of Via de la Valle. As previously stated, the data provided in the Coaster EIR document is limited to the station areas. The San Dieguito River Park Plan EIR contains biological data compiled from the existing MSCP mapping in the vicinity of the Del Mar alignment at the west end of San Dieguito Lagoon. The data from this relatively recent study is sufficient for the portion of the alignment in the vicinity of the San Dieguito Lagoon.

The area that is important in terms of biological resources along the Del Mar alignment is located within the SDNR right-of-way north of Del Mar Heights road. Existing native habitats along the coastal bluff may constrain any realignment of the pedestrian trail. Although coastal sage scrub, coastal bluff scrub, maritime succulent scrub, southern coastal salt marsh, or beach/saltpan habitats are known to occur along the alignment, there are no expected impacts since the trail will not be constructed within the railroad right-of-way. No federal or state-listed sensitive species are known to occur directly along the Del Mar alignment; however, important sensitive species that have been documented in the vicinity of the Del Mar alignment include, Belding's savannah sparrow and California gnatcatcher. A complete list of federal and state-listed endangered, threatened, and candidate species that have the potential to occur in the

vicinity of the alignment is presented in Table 28.

The Mid-Coast Corridor EIR and the Coaster EIR included coverage of the area outside of the proposed trail alignment. Therefore, data from these reports were not applicable for purposes of this analysis. The San Dieguito River Park Plan EIR provided data that is relatively current for the area where the Del Mar alignment crosses San Dieguito Lagoon, however, at this location, the proposed trail avoids the lagoon. A proposed at-grade crossing at 29th Street would provide access from the San Dieguito River Park trails to the Coastal Rail Trail. The at-grade crossing is located in an area, which has been previously disturbed.

The results of the CNDDB search for the Del Mar alignment indicated that there are four wildlife species that are considered threatened or endangered at the state or federal level that have been known to occur in the vicinity. These include the following species: California least tern, California gnatcatcher, Belding's savannah sparrow, and western snowy plover. Two plant species considered endangered by the state, short-leafed dudleya and Orcutt's spineflower are known historically to occur in the area. A list of sensitive plants potentially occurring along the alignment is presented in Table 27. There are several other sensitive wildlife species associated with the area, including the orange-throated whiptail, and the coast barrel cactus, presented in Table 28.

The Mid-Coast Corridor EIR and the Oceanside-San Diego Commuter Rail EIR were not site specific to determine the availability of existing data for the proposed trail. The data provided in the San Dieguito River Park Plan EIR is relatively current. However, the rail trail is not expected to affect the San Dieguito Lagoon. Portions of the Del Mar alignment, where it potentially traverses sensitive biological areas south of Del Mar Heights Road as well as south of Stratford Court, should be surveyed if any new trails are constructed.

Critical survey windows for sensitive wildlife and plant species that may potentially occur in native habitats along the two areas of this alignment generally runs from April through July. This time frame will allow surveys to be performed at the optimal time to detect the presence of the federal and state threatened or endangered species.

As noted for the trail alignments described above, if federal or state-listed species are detected during the required biological surveys, then the US.F.WS and CDFG would need to be contacted to discuss the project's affects and required mitigation either through formal or informal consultations. Since there are no proposed trail improvements there is no need to pursue surveys unless the trail is realigned along the right-of-way.

Issuance of a categorical exemption may be obtained for the Del Mar segment since no new trails are proposed.

Cultural Resources

The cultural resources section of the San Dieguito River Park Concept Plan EIR was prepared in 1993 by Gallegos & Associates. The section consisted of a literature review only of the proposed study area and did not include field survey, or resource evaluation testing programs. Since the park area extends 55 miles to the east and the area of the bike trail, which is within the park boundaries, will be located on the road, this study does not provide any relevant data.

Review of current aerial photographs indicates that no historic resources are located within the current railroad right-of-way; therefore, no historic resources will be affected by the proposed project.

The available documentation for the Del Mar segment identifies the potential of several prehistoric sites to occur in the general vicinity. No maps were included to show the survey boundaries and locations of the prehistoric sites, therefore, the study cannot be used to determine the absence/presence and potential significance of cultural resources within the current study area. Potential areas of concern associated with prehistoric resources are generally limited to the SDNR right-of-way. Should any new trails be developed, a survey consisting of a walkover would help determine whether prehistoric sites exist along the alignment. For any new trails, a data records search should be conducted to provide location data and site form information on all previously recorded cultural resource sites within the trail alignment.

10.12 San Diego Alignment (See 5. 8– 5.11)

This trail enters the City of San Diego at Carmel Valley Road in the Torrey Pines area. From the intersection of Carmel Valley Road and North Torrey Pines Road, the pedestrian trail alignment follows the railroad right-of-way southeast for approximately 100 feet through the Torrey Pines State Reserve until it shifts further eastward along the Carmel Valley Road right-of-way. The trail alignment extends near the site of the future SR-56. This freeway, which is currently under construction, will provide east-west access from I5 to the inland communities of Los Penasquitos, Poway, and Rancho Bernardo. At the point where Carmel Valley Road intersects with Sorrento Valley Road, the trail alignment shifts directly south until it reunites with the SDNR and continues along the railroad crossing under the I-5 freeway first and further southeast under the I-805 freeway. After crossing under the I-805 freeway, the alignment continues eastward along the SDNR right-of-way, through Soledad Canyon until it reaches Miramar Road within the Miramar Marine Corps Air Station.

After crossing under Miramar Road and entering MCAS Miramar, the trail alignment continues southwest along the east side of the railroad right-of-way, utilizing an existing dirt road, and crosses to the north side of the rail at I-805 where it proceeds through the Rose Canyon and University City area until it reaches the western portion of Highway 52. The Nobel Drive station is proposed by NCTD along this segment.

The rail trail travels south through or near the Clairmont, Pacific Beach and Mission Bay areas. At Balboa Avenue, the alignment crosses on a bridge over Balboa Avenue, continually following the railroad. At Friars Road, the trail crosses under the rail right-of-way to Pacific Highway, accessing existing bicycle lanes. The alignment would continue along Pacific Highway to the Santa Fe Train Depot in downtown San Diego.

Biological Resources

Seven environmental documents were reviewed to determine existing biological resources along the San Diego alignment including the Oceanside to San Diego Rail Commuter Rail Project (Coaster Rail Project), North City Water Reclamation Plant, Rose Canyon Trunk Sewer, Mid-Coast Corridor Alternatives Analysis DEIS/DEIR, Nobel Drive Extension, Nobel Drive Commuter Rail Station projects, and the Realignment of NAS Miramar EIS. These documents covered areas along the alignment from Carroll Canyon Road east of I-805, up to Miramar Road, through MCAS Miramar and back to the southern underpass of I-805, 500 feet west of the freeway. Environmental documentation also covered from 0.25 mile east of Genesee Avenue to the west end of Highway 52, and from the west end of Highway 52 to Balboa Avenue. All of these documents, with the exception of the Coaster EIR, are relatively recent, and provide a great deal of adequate information.

The majority of the San Diego alignment goes through developed areas; however, the proposed trail alignment extends through three areas considered to be environmentally constrained. The first area where the trail extends through highly sensitive habitat occurs when the alignment crosses one of the tributaries of Los Peñasquitos Creek in the Sorrento Valley area. Potential bridge crossings along the creek would involve minor disturbance to wetland habitats in Sorrento Valley.

The second area where the trail extends through a sensitive area occurs through Soledad Canyon north of MCAS Miramar. This area is predominantly covered by coastal sage scrub and chaparral habitats. The area is disturbed by numerous informal trails. The trail would be located adjacent to the railroad as it proceeds up Miramar Hill avoiding the sensitive valley floor.

Another area of concern includes the MCAS Miramar property. To the extent possible, the proposed trail would utilize an existing access road as it extends through the MCAS Miramar property. However, areas within MCAS Miramar consist of highly sensitive biological resources and wildlife corridors, as identified in the MCAS Miramar EIS. Use of barriers may constrain three wildlife corridors that extend through MCAS Miramar. These wildlife corridors lead to Soledad Canyon, Peñasquitos Lagoon, and Torrey Pines State Reserve. Should barriers be required along the entire length of the trail through the air station, potential impacts to wildlife corridor movement could occur unless a vegetation barrier is used or a fence which allows for movement of wildlife. Indirect impacts due to increased human disturbance may also occur to sensitive biological resources, including vernal pool and coastal sage scrub habitats, as well as sensitive plant and animal species. Interpretive signs in these locations may be used to limit access in

these areas.

One federally threatened bird species, the California gnatcatcher and one state endangered bird species, Belding's savannah sparrow, are documented in the CNDDB as occurring in the vicinity of MCAS Miramar. Two plant species listed as endangered at the state and federal level are also associated with this segment of the project. San Diego mesa mint and San Diego button celery are known to occur in vernal pools in the southwestern part of the County, including those found in the vicinity of MCAS Miramar. The CNDDB search results also determined that the state endangered, short-leafed dudleya and Orcutt's spineflower are both known to have occurred historically in the vicinity. A summary of the sensitive plants potentially occurring within the Sorrento Valley alignment is shown in Table 27.

Rose Canyon Open Space Park contains oak woodland habitat. The trail has been diverted to avoid this area by placing a bridge over the railway at I-805 in the long-term. In the short-term, an at-grade crossing may be considered. The trail proceeds along the north side of the railroad avoiding the Open Space Park.

The CNDDB indicates that the following federal and state-listed species may occur in the vicinity of the alignment: San Diego button celery, San Diego mesa mint, California gnatcatcher, Belding's savannah sparrow, and San Diego fairy shrimp. Other sensitive species may potentially occur in the vicinity of the San Diego alignment. California gnatcatchers have been sighted in the vicinity of the Nobel Drive Transit Station Site.

The North City Water Reclamation Plant, the Nobel Drive Commuter Rail Station, Rose Canyon Trunk Sewer, Nobel Drive Extension, and the Realignment of NAS Miramar EIS documents all provide extensive documentation of biological resources along the San Diego alignment from 500 feet west of I-805, until it reaches the south side of Miramar Road at the edge of MCAS Miramar. The Mid-Coast Corridor EIR and the Oceanside-San Diego Commuter Rail EIR did not provide adequate biological coverage of the San Diego alignment.

Critical survey windows for sensitive wildlife and plant species that may potentially occur in native habitats along the two areas of this alignment generally runs from March through July. This time frame will allow surveys to be performed at the optimal time to detect the presence of the federal and state threatened or endangered species.

The San Diego trail alignment has been modified to avoid traversing through three key areas, which may pose greater environmental constraints. Based on the potential number of impacts and potential issuance of resources permits, the proposed project may require preparation of an Initial Study/Environmental Assessment. Through trail realignment or site design measures, impact may be avoided or minimized.

Cultural Resources

Portions of the San Diego alignment have been addressed by several different reports and studies including the Realignment of NAS Miramar EIS document. This recent study addressed the cultural resources within the boundaries of the MCAS Miramar, however, the segment of the base that included the railway was specifically exempted from the study. Therefore, no cultural surveys were conducted along the SDNR alignment for the MCAS Miramar study.

The Mid-Coast Corridor Environmental Impact Statement and Cultural Resources Technical Report deal with a small portion of the area encompassed by the San Diego trail. The study area for the Mid-Coast Corridor crosses the railroad line just north of Sorrento Valley Boulevard, and again in the vicinity of Miramar Road, Rose Canyon and continues on to Mission Valley and downtown San Diego. No cultural resources were located within the Sorrento Valley area of the alignment.

Eight studies were available for review for the University portion of the alignment and three of the EIR studies and the associated cultural resources technical reports are considered to be adequate to address potential cultural resources that may occur along the trail alignment. The Mid-Coast Corridor EIR and Cultural Resources Technical Report; the Nobel Drive EIR and Cultural Resources Technical Report; and the Rose Canyon Trunk Sewer EIR and Cultural Resources Technical report address cultural resources in these areas. The Mid-Coast Corridor study included a record search, field study, and significance determinations for 17 prehistoric sites, and 8 historic sites. Three of the prehistoric sites had previously been determined to meet the criteria for significance under both Section 106 and CEQA in the Rose Canyon Trunk Sewer EIR document. The Mid-Coast Corridor study concurred with these findings.

The Phase I Historic Properties Inventory of the Nobel Drive Station conducted by Ogden Environmental in 1993 covers a small section of the alignment that extends along the railroad line in Rose Canyon from the railroad track on the north side to Nobel Drive for a portion of the distance centered between Towne Center and Shoreline Drives. The study included a field survey and archival research, which concluded that no cultural resources were present along the north portion of the track up to Nobel Drive. The southern portion below the track was not surveyed. The report is considered to have adequately addressed cultural resources north of the track for purposes of the Rail Trail PSR but the area south of the track for the bike path was not addressed. This area of study would need to be addressed for this portion of the track.

The Nobel Drive Extension EIR/EIS study was completed in 1996. The study area for the project extended from north of Miramar Road along Interstate 805, crossed the railroad tracks and continued south along I-805 below Governor Drive. A portion of the railroad tracks was covered by the study. The study included archival research, a field survey and testing of 35 prehistoric sites. No historic sites were found. The testing program concluded that one prehistoric site was eligible for the National Register, under Section 106, criteria and two others were significant under CEQA criteria only. The study is

considered to have adequately addressed cultural resources within the project area and the area to be covered by the rail trail..

The Mid-Coast Corridor Environmental Impact Statement and Cultural Resources Technical reports also address the area that extends along the railroad line from just west of Genesee Street where it crosses the track and continues southward through Rose Canyon down to where the railroad track parallels Interstate 5 then continues on to Interstate 8. The study lists cultural resources along the railroad track in the section of the alignment from Interstate 8 north to Rose Canyon. The field survey, archival research and testing program are considered adequate to address cultural resources along the SDNR right-of-way and the proposed bike path.

The Realignment of NAS Miramar EIS document addressed the cultural resources within the boundaries of the MCAS Miramar. The base was surveyed and cultural resources were tested for significance, with the exception of a corridor that included the railroad and the immediately surrounding territory. Therefore, the base realignment document contains no information relative to cultural resources that would directly relate to the construction of the rail trail.

The Mid-Coast Corridor Environmental Impact Statement and Cultural Resources Technical Report deal with a small portion of the area encompassed by the Sorrento Valley Alignment. An archival search and field survey were conducted and determinations of significance were made for cultural resources within the project area. The Mid-Coast Corridor study is considered to have adequately addressed the cultural resources within the survey area. The Area of Potential Effect addressed in that report included a 200-foot corridor along the railroad (100 feet on each side of the track). As currently proposed, a majority of the rail trail extends in close proximity to the SDNR railroad, and therefore is included within the 200 foot corridor study.

The Rose Canyon Trunk Sewer EIR (1992), the Rose Canyon Trunk Sewer Cultural Resources Technical Report (1992), and the Rose Canyon Interceptor No. 3 Constraints Analysis Report (1989) cover similar territory in Rose Canyon along the railroad line. The Rose Canyon Interceptor No. 3 Constraints Analysis Report consisted of archival research and a "windshield" level field survey. A total of 19 sites were revealed during the archival research. No testing of the sites or significance determinations were made as part of the study. The Rose Canyon EIR and Cultural Resources Technical Report studies included a field survey, a record search, and testing of 5 prehistoric sites and 2 historic sites for significance under both Section 106 and CEQA. Three sites were considered to meet the criteria for both levels of significance and the other four were considered to not be significant. The three studies taken together are considered to have adequately addressed the cultural resources issues along the Rose Canyon section and the portion of the railroad assuming the proposed trail stays within the 200 foot corridor covered by these studies.

The Phase I Historic Properties Inventory of the Nobel Drive report provides adequate cover for the northern portion of the railway. The area to the south of the tracks,

however, were not included in that Historic Properties study.

The Nobel Drive Extension EIR/EIS study is considered to have adequately addressed cultural resources within the project area, which encompasses the area, traversed by the proposed bike trail.

Unsurveyed areas traversed by the proposed trail were identified to occur north of and within MCAS Miramar. Archaeological surveys should be conducted to avoid or minimize potential cultural resources along these areas.

Unsurveyed areas for cultural resources were identified where the proposed trail extends along the southern side of the railroad line through Rose Canyon. Should placement of the trail occur in this southern area, archaeological surveys would be required.

The eight EIRs and associated cultural resources technical studies provided for review - the Rose Canyon Trunk Sewer EIR and associated reports, the Nobel Drive EIR and associated reports, the Mid-Coast Corridor EIR and associated studies for the Rose Canyon/ University City area are considered adequate to address the potential impacts to cultural resources associated with the construction of the bike path for the portions of the alignment which they covered. However, the studies do not cover the entire alignment. Unsurveyed areas for cultural resources were identified where the proposed trail extends along the southern side of the railroad line through Rose Canyon. Should placement of the trail occur in this southern area, archaeological surveys would be required.

10.13 Summary

The Coastal Rail Trail project as a whole must be discussed in the NEPA document to receive FHWA approval. On July 25, 1997, the FHWA representative determined that: 1) a NEPA EA/FONSI document is required and 2) The studies required are biological, noise and cultural resource focused studies. A subsequent meeting on January 21, 1998, with the Army Corps of Engineers, RWQCB, US.F.WS, and Fish and Game determined that there was no potential affect to water quality.

Biological survey and wetland delineation have not been completed for areas identified in this chapter. Further analysis of the impact on sensitive biological resources would be conducted as part of the NEPA/CEQA process. Permits from the appropriate regulatory agencies will be determined. It is anticipated that the trail may be adjusted to avoid areas of encroachment into sensitive habitats. Any biological studies, which are 2 years old at the time of final environmental approval, will need to be updated and an updated species list will need to be requested from US.F.WS.

The specific locations of construction activities related to the rail trail have not been field surveyed in most cases to determine the presence (or absence) of prehistoric cultural resources sites. The only exceptions are cases where a site has been previously tested and a report of the results is available. For sites where no site testing has been conducted and, for purposes of this document, cultural resources can only be preliminarily assessed for

significance/importance using National Register of Historic Places (NRHP) and CEQA criteria.

When final trail alignments are selected and specific information related to site construction activity (i.e., earth removal, depth of grading, etc.) are known, archaeological (deposit bearing)/cultural resources (prehistoric) would need to be evaluated. If sites are identified, testing is usually required to determine significance and/or importance. The testing evaluation establishes site size, extent, depth, integrity, and potential to address important research questions. This information can then be used as a means of accurately assessing impacts to these important resources, and to guide development of the project to avoid the sites or implement appropriate and feasible mitigation measures.

Table 25

DOCUMENTATION APPLICABLE TO THE PROPOSED PROJECT

Project	Coverage	Vegetation	Sensitive Plants	Sensitive Wildlife	Comments
Mid-Coast Corridor Alternatives Analysis	I-8 to Villa de la Valle	Map available (1991 data)	Map available (1991 data)	Map available (1991 data)	Data may be somewhat outdated, and portions conflict with Rose Canyon Trunk Sewer data
Nobel Drive Extension	500 ft. west and 2000 ft. east of I-805	Map available (1993 data)	Map available (1993 data)	Map available (1993 data)	
Nobel Drive Commuter Rail Station	0.5 mile west of I-805, between Nobel Drive and the AT&SF right-of-way	Map available (1993 data)	Map available (1993 data)	Surveys conducted (1993), but no map provided in the BA (text description only)	
Realignment of NAS Miramar	I-805 east to south of Miramar Rd.	Map available (Ogden GIS)	Map available (Ogden GIS)	Map available (Ogden GIS)	
San Dieguito River Valley Regional O/S Park	Highway 101 at west end of San Dieguito Lagoon	MSCP mapping	No detailed surveys	No detailed surveys	No detailed biological surveys were conducted; all data based on existing MSCP mapping
North City Water Reclamation Plant	East of I-805 at Miramar Road	Map available (1992 data)	Text only (1992)	Text only (1992)	Property is near, but does not include, the proposed Coast Rail Trail alignment; detailed sensitive biological data exists, but we don't have it
Batiquitos Lagoon Dredge Project	West end of Batiquitos Lagoon	Map available (1990 data)	no data	no data	Vegetation has probably changed after the lagoon was dredged; no sensitive species surveys were conducted
Rose Canyon Trunk Sewer	From Avati Drive at Morena Boulevard, to 0.25 mile east of Genesee Avenue	Map available (1992 data)	text only	text only	Sensitive species documentation is "text only" because no sensitive plants or animals were found

Table 26

COASTAL RAIL TRAIL
RELEVANT ADEQUATE CULTURAL RESOURCES DATA

Project	Coverage	NR/CEQA Sites	Project Area Covered
Mid-Coast Corridor EIR/Cult. Res. Tech. Report	I-8 to Via de La Valle	3 prehistoric sites	Intersection of RR line and I-5 North of Sorrento Valley Road; Rose Canyon south to I-8
Nobel Drive Extension EIR/Cult. Res. Tech Report	500 ft. west/2000 ft. east of I-805	1 prehistoric - NR 2 prehistoric - CEQA	East of Rose Canyon on both sides of I-805
Cultural Resources Study for the Rose Canyon Trunk Sewer Project; EIR and Cult. Res. Tech. Report	East and south of University Towne Centre; along Rose Creek to I-5; and parallel to I-5 on the east side	3 prehistoric sites	Rose Canyon from east of Genesee to I-5 and south along I-5

Table 27

Coastal Rail Trail
Sensitive Plant Species Known from the Project Vicinity

Common Name	Status		CNPS Code	Blooming Period												Affected Jurisdictions					
	Federal	State		J	F	M	A	M	J	J	A	S	O	N	D	O	C	E	SB	DM	SD
San Diego thorn-mint	PE	SE	1B, 2-3-2															X	•	•	X
California adolphia		CEQA	2, 1-2-1													X	X	X	•	X	X
Del Mar manzanita	PE		1B, 3-3-2																	X	
San Diego sagewort		CEQA	2, 2-2-1																	•	X
Coastal dunes milk-vetch	PE	SE	1B, 3-3-3													•	•	•	•	•	•
Encinitas baccharis	PE	SE	1B, 2-3-3															X			
Velvet cactus		CEQA	2, 2-2-1																	X	X
Orcutt's spineflower	PE	SE	1B, 3-3-3																	X	X
Sea dahlia		CEQA	2, 2-2-1													X	•	•	•	X	X
San Diego sand aster		CEQA	1B, 2-2-2																•	X	X
Del Mar Mesa sand aster	PT		1B, 3-2-3													•	X	•	X	X	X
Short-leaved dudleya	PE	SE	1B, 3-3-3																	X	X
Sticky dudleya	R		1B, 3-2-3													X	•				
San Diego Button Celery	FE	SE	1B, 2-3-2													•				•	X
Cliff spurge		CEQA	2, 2-2-1													•	X	•	•	•	X
Willowy monardella	PE	SE	1B, 2-3-2																		X
Slender woolly-heads		CEQA	2, 2-2-1													•				•	X
San Diego mesa mint	FE	SE	1B, 2-3-3													•				•	X
Otay Mesa mint	FE	SE	1B, 3-3-2																	•	•

FE =federally endangered
SE =state endangered
FT =federally threatened
PE =currently petitioned for federal endangered status
R =federally rare
PE =currently under petition for federal endangered status
PT =currently under petition for federal threatened status
CEQA =considered sensitive under CEQA
=period when plant is in bloom, and is easiest to identify

O =Oceanside
C =Carlsbad
E =Encinitas
SB =Solana Beach
D =Del Mar
SD =San Diego
X =species is known from the area
• =species may occur in the area

Data from Document Review, MSCP, MHCP, CNDDB, and CNPS data bases.

Table 28

COASTAL RAIL TRAIL
SENSITIVE WILDLIFE SPECIES KNOWN FROM THE PROJECT VICINITY

Species	Status	Affected Jurisdictions					
Common Name	Federal/State	O	C	E	SB	DM	SD
Mammals							
Pacific little pocket mouse	FE/**	X	•	•		•	•
Birds							
Least Bell's vireo	FE/SE	X		•			•
California gnatcatcher	FT/CSC	X	X	•		X	X
Cactus wren	**/CSC		X	•			
California least tern	FE/SE					X	
Light footed clapper rail	FE/SE	X					
Belding's savannah sparrow	**/SE	X	X	X		X	X
California brown pelican	FE/SE						
American peregrine falcon	FE/SE						
Golden eagle	BEA/SP	•	•				
Black-crowned night heron	**/CSC	X				X	
Great blue heron	**/CSC	X	•				
Double-crested cormorant	**/CSC	X	•				
Northern harrier	**/CSC	X	X			X	•
Burrowing owl	**/CSC	X	X				
Sharp-shinned hawk	**/CSC	•	•	•		•	X
Cooper's hawk	**/CSC	X	X	X		X	X
White-tailed kite	**/SP	X	X	•		X	•
Yellow warbler	**/CSC	X					
Yellow-breasted chat	**/CSC	X					
Western snowy plover	FT/CSC	•	•			•	•
Reptiles							
Southwestern pond turtle	**/CSC	X				X	X
Orange-throated whiptail	**/CSC					X	X
Amphibians							
California red-legged frog	FT/**	X					
Fish							
Tidewater goby	FE/SE	X					
Invertebrates							
Riverside fairy shrimp	FE/**		•				•
San Diego fairy shrimp	PE/**		•				X
Vernal pool fairy shrimp	FT/**		•				•

= period of time when surveys can be conducted

= the breeding season, usually the optimal time for surveys to be conducted

FE = federally endangered
SE = state endangered
FT = federally threatened
PE = currently petitioned for federal endangered status
BEA = federally protected under the Bald Eagle Act
SP = state protected
CSC = California species of concern
** = no status

O = Oceanside
C = Carlsbad
E = Encinitas
SB = Solana Beach
D = Del Mar
SD = San Diego
X = species is known from the vicinity of the alignment
• = species may occur in the vicinity of the alignment

APPENDIX A
PUBLIC PARTICIPATION PROCESS

Public Participation Process

Throughout the development of this project, numerous public meetings and workshops were conducted. The purpose of these meetings was to inform the public about the project, encourage public interest, and to solicit public response and comments. Generally, the format of the meetings included a slide presentation, scope of the project, funding, the process, and project schedule followed by questions and answers. The workshops were conducted by a team consisting of the project manager, Steve Jantz from the City of Carlsbad and the Transtech Engineers, Inc. staff. Additional support was provided by the Coastal Rail Trail Committee members.

The attendance at these presentations varied from five attendees at the Solana Beach Historical Society to over 100 at the 1st Annual San Diego Trails Council Conference held in Descanso. Overall enthusiastic comments were received at these community workshops and presentations about the project. The most frequently asked questions or comments included:

Question: How many people do you expect to use the trail?
Answer: *Based on population projections, peak season usage, and corresponding data from other similar trails, it is estimated that over 7 million bicyclists, joggers, walkers, and roller bladers will use the trail annually.*

Question: This trail might be fine for some people but I won't use it.
Response: *The intent of the trail is to provide a trail facility for those persons who are not comfortable biking on a busy roadway, adjacent to traffic. The trail will provide a walking corridor for pedestrians as well.*

Question: Will the bicycle lanes on Highway 101 be removed when the Coastal Rail Trail is completed?
Answer: *No, the San Diego Bicycle Use and Attitude Survey conducted in May 1994 concluded that 41% of persons did not bicycle because there was a "lack of desired bike facilities". The Coastal Rail Trail will provide a facility for those users who do not currently bike on the road.*

Question: When the project is complete will there no longer be the packs of bicyclists on Highway 101?
Answer: *Bicyclists who currently ride in the street will probably continue to ride in the street.*

Question: What are the economic benefits of the trail?
Answer: *Trail users spend approximately $14/per capita. It is estimated that the trail will have approximately 2.1 million annual non-local users which will generate an estimated $29 million annually to the San Diego region.*

Question: Who will pay to build the trail?
Answer: *The trail is currently being funded through various grants. It is the intent*

of the six cities to continue to pursue grant funding to design and construct the trail.

Question: Who will maintain the trail?
Answer: *It is assumed maintenance will be performed by the jurisdiction in which the trail is located. However, the six cities may consider forming a regional trail authority (a JPA) or assigning the maintenance responsibilities to an existing regional agency for coordination and cost savings benefits.*

Question: Does the trail have to be paved?
Answer: *The trail is being designed to CalTrans standards for a Class I Bikeway and Americans with Disabilities Act. A Class I Bikeway is defined as a "minimum paved width for two-way bike path shall be 8 feet". A paved surface may be asphalt, concrete, or a hard surface slurry seal that blends with the environment. Each jurisdiction may select a paving surface that is more conducive to their particular location.*

Question: Will there be a fence? How high will the fence be? What is the purpose of the fence?
Answer: *A barrier, either vegetation or fencing, is recommended when the trail is located closer than 25 feet from the edge of the trail to the centerline of the closest track and where the vertical separation is less than 10 feet. Height of a fence or vegetation barrier will be determined in the design phase based on the specific circumstance.*

Question: Will there be landscaping between the trail and the railroad?
Answer: *Landscaping is recommended to provide a physical barrier between the trail and the railroad, as well as provide visual quality.*

Question: Does the railroad owner want the trail?
Answer: *The Board of Directors of the San Diego Northern Railway has formally supported the construction of the Coastal Rail Trail and is a signatory of the MOU..*

Question: How close will the trail be to the railroad?
Answer: *The trail will be located a minimum of 15' from the centerline of the railroad. In areas where the right-of-way permits, the trail will be located farther.*

Question: How soon will it be completed?
Answer: *The trail will be constructed in phases, as funding is achieved, over a period of ten years. The first phase is scheduled to begin construction in 1999.*

Question: Will there be more than one trail -- one for bicyclists and one for pedestrians?

Answer: *Where the right-of-way is wide, it is recommended that a separate trail for pedestrians be constructed.*

APPENDIX B
PUBLIC MEETINGS

Public Meetings

Meetings were held at the following locations and dates:

Date	Organization	Location
09/20/95	Parks and Recreation Commission	City of Solana Beach
01/10/96	City Council	City of Oceanside
02/13/96	City Council	City of Carlsbad
02/14/96	Optimist Club	Del Mar Hilton, Del Mar
02/21/96	Planning Group	NAS Miramar
03/18/96	City Council	Solana Beach
05/29/96	Bicycle Advisory Committee	SANDAG, San Diego
06/03/96	ROSE Extension Committee	Scripps Miramar Ranch Library
06/06/96	Rose Canyon Recreation Council	Doyle Recreation Center, San Diego
06/11/96	American Public Works Assoc. San Diego/Imperial Valley Chapter	City of Carlsbad, Engineering Office
06/12/96	Miriam Bear Recreation Council	Clairmont Recreation Center
06/19/96	Solana Beach Parks & Recreation Commission	City Council Chambers, Solana Beach
06/20/96	NCTD Board of Directors	NCTD, Tremont Street, Oceanside
08/01/96	Rose Canyon Recreation Council	Doyle Recreation Center
08/05/96	Rose Citizens' Advisory Committee	Scripps Miramar Ranch Library Center
08/08/96	Torrey Pines Planning Group	Del Mar Heights School, Del Mar
08/29/96	Highway 101 Merchants Assn.	Solana Beach, CA
09/10/96	Solana Beach Chamber of Commerce	Highway 101, Solana Beach
09/10/96	City Council	City of San Marcos
09/19/96	Solana Beach South Sierra Homeowners Assoc.	Solana Beach, CA
09/19/96	Solana Beach Tennis Club	Solana Beach, CA
09/23/96	Solana Beach Historical Society	Fletcher Cove Recreation, Solana Beach
09/24/96	San Diego County City Engineers	City of Carlsbad
09/24/96	City Council	City of San Marcos
09/30/96	South Cedros Merchants Assoc.	Belly Up Tavern, Solana Beach
10/01/96	City Council	Solana Beach, CA
10/04/96	San Dieguito River Park Citizen Advisory Committee	Rancho Bernardo Heights Rec. Center
10/05/96	San Diego Trails Council 1st Annual Conference	Descanso, CA
10/07/96	City Council	City of Del Mar
10/15/96	City Council	Solana Beach
10/25/96	Liability Workshop	City of Carlsbad, Safety Center
11/05/96	City Council	City of Carlsbad
11/13/96	City Council	City of Encinitas

12/02/96	City Council	City of Del Mar
12/05/96	Bicycle Coalition	Tierra Santa Recreation Center
12/09/96	Encinitas Workshop	City Hall, Encinitas
12/18/96	SANDAG	San Diego, CA
01/08/97	City Council	City of Oceanside
03/19/97	City of San Diego City Council Natural Resource Committee	San Diego, CA
04/29/97	Operation Lifesaver	Los Angeles, CA
04/16/97	Frederick R. Harris, Inc.	City Hall, Solana Beach
05/17/97	Agua Hedionda Lagoon Committee	Carlsbad, CA
06/03/97	Mission Bay Park Committee	Mission Bay Park
06/11/97	Old Town Planning Group	Old Town, San Diego
06/13/97	Solana Beach Civic Association	Pacific Coast Grill Solana Beach
06/23/97	Pacific Beach Community Planning Committee	San Diego, CA
07/03/97	Pacific Beach Planning Group	Pacific Beach Library Pacific Beach
07/19/97	Transportation Committee	Administration Building San Diego
12/02/97	San Dieguito River Valley	
02/06/97	Ad Hoc Coastal Rail Trail Committee	City of Del Mar
12/18/97	NCTD / MTDB	San Diego, CA
01/15/98	MTDB	San Diego, CA
01/29/98	1st International Rails-to-Trails Conservancy Conference	San Diego, CA
03/02/98	City of Carlsbad Traffic Safety Commission	City of Carlsbad, City Council Chambers
03/24/98	Carlsbad Village Business Association	Carlsbad Inn
05/04/98	Northwest Quadrant Association	Private Residence, Carlsbad
05/07/98	Rotary Club -Carlsbad	Raintree Inn
05/22/98	MCAS, Miramar Community Land Use and Management Planning Committee	MCAS, Miramar
9/22/98	Oceanside Chamber of Commerce	El Camino Inn, Oceanside

APPENDIX C
COASTAL RAIL TRAIL COMMITTEE MEETINGS

Coastal Rail Trail Committee Meetings

At the onset of the project, the Bicycle Advisory Committee of San Diego Association of Governments created a staff advisory committee to oversee the project. This Coastal Rail Trail Committee met on a monthly basis and was composed of representatives from each of the six agencies. The meetings were regularly attended by staff representatives from the Cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, San Diego and the San Diego Association of Governments, North County Transit District, and California Department of Transportation. Other agencies that were notified of the meeting but did not attend on a regular basis, including the Metropolitan Transit Development Board, NAS Miramar, and MCAS El Toro.

Except for two occasions, the Coastal Rail Trail Committee meetings were held at the City of Carlsbad, Engineering Offices, 2075 Las Palmas Drive, Carlsbad on the following dates:

March 1, 1996
April 18, 1996
June 13, 1996
July 25, 1996
September 26, 1996
December 12, 1996
February 27, 1997
May 29, 1997
July 31, 1997
September 25, 1997
November 20, 1997
March 12, 1998
April 20, 1998
June 25, 1998
August 27,1998
November 19, 1998
May 25, 2000
July 27, 2000
October 26, 2000
March 21, 1996
May 16, 1996
July 11, 1996
August 29, 1996
October 24, 1996
January 23, 1997
March 24, 1997
June 26, 1997
August 28, 1997
October 23, 1997
January 22, 1998
March 26, 1998
May 28, 1998
July 23, 1998
October 22, 1998
April 21, 2000
June 22, 2000
August 24, 2000

Appendix D
Response to Questions from "Addressing Liability of Rails with Trails" Workshop

Response to Questions from "Addressing Liability of Rails with Trails" Workshop

Question: Are the RTC case studies relevant to the Coastal Rail Trail corridor, specifically in regards to high speed rail operations?

Response: Twenty-three (23) of the thirty-seven (37) case studies in the Rails-to-Trails Conservancy's "Trails-with-Rails Study" are located along mainline railroads, which typically involve higher train speeds. One of those, the Irvine Rail trail, is actually on a similar type of high speed mainline as the Coastal Rail Trail and has essentially the same train frequencies and speeds. There are other Rail trails adjacent to mainline railroads with high speed rail service located in San Fernando Valley, Davis, Sacramento, and other locations throughout the United States.

There has been no known research published that correlates train speed with higher pedestrian or bicycle accident rates. The existing high speed railroad corridors in California, Illinois, and the Northeast United States, including the NCTD corridor, all have grade crossings and parallel roadways where pedestrians and bicyclists are permitted near and on (crossing) active tracks.

It may be useful to consider comparable situations to help answer this question. Cities throughout San Diego County, California, and the United States, regularly approve and build bike lanes and crosswalks that put pedestrians and bicyclists either directly in the path of motor vehicles or within two or three feet of motor vehicles. Sidewalks and crosswalks are accepted because it is assumed that a) pedestrians need to have access along and across streets and b) pedestrians can make a decision when it is appropriate (safe) to cross a street. Some of these roadways, such as Pacific Coast Highway in San Diego County, carry over 20,000 vehicles per day, traveling at speeds of 55 miles per hour. There are documented accidents on these roadways involving pedestrians and bicyclists. From the perspective of placing pedestrians and bicyclists close to vehicles which can cause injury or death, a high speed railroad line with 30 trains per day poses substantially less of a safety risk than bike lanes or crosswalks on a busy high speed arterial.

It may be argued that railroads are not similar to roadways in that they may attract people, especially children, to walk or play on the tracks. Other than 'No Trespassing Signs," there is little to deter anyone from crossing or walking along the railroad. It could be argued that the presence of an active trail in the corridor would increase visibility and dissuade loitering or playing on the tracks. More importantly, people who currently walk along the tracks would be able to discontinue walking on the tracks and walk on a trail.

Question: How many of the RTC case studies are actually located within (as opposed to adjacent) the railroad right-of-way?

Response: The RTC Report states that relatively few (22%) of the rail trails are located within the active railroad corridor. The study does identify that 55% of the trails were located within 20 feet or less of the tracks, which would put them very close to active railroads. Research performed by NCTD indicates that about 26% of the trails were located within active railroad corridors.

One purpose of the RTC study, and the reason it was included in this report, was to identify whether there are safety problems associated with locating trails near active railroads. Safety is a function of proximity, fencing, and other physical and operating characteristics of the corridor. Safety is not directly related to land ownership. There are, however, numerous examples of trails being located on easements within active railroad right-of-ways. For example, the Alton Trail in Santa Ana is located on an easement within an active Union Pacific Railroad corridor.

The liability exposure of a railroad is typically no greater when a rail trail is located on an easement within the right-of-way, than if it is immediately adjacent to the right-of-way. First, it is common for a Rail trail to indemnify the railroad as part of an easement agreement. Second, there is no documented correlation between rail trails along active railroads and safety problems. Finally, regardless of the rail trail location the railroad itself will remain private property and be fenced, patrolled, and/or signed as needed.

Question: It appears to be the general rule that fencing is provided between the rail trail and tracks when the trail is located within the railroad right-of-way. What is the plan for the Coastal Rail Trail?

Response: According to the RTC study, fencing is provided on approximately 20% of the 37 facilities surveyed. The final draft Coastal Rail Trail Project Study Report (PSR) recommends that barriers be provided wherever the trail is located closer than 25 feet to the centerline of the nearest track, and where there are existing informal crossings that need to be channelized. The Coaster Rail Trail will be located as far away from the tracks as possible. Barriers would likely be provided in all constrained parts of the corridor.

Where the Coastal Rail Trail is located closer than 25' to the tracks, a 48"-60" barrier is recommended of a solid type to help baffle noise and wind. Breaks in the barriers are recommended every 500 feet, unless a suitable grade separated crossing is provided.

Question: Are there any existing rail trails located within railroad corridors that have high speed rail service, and also have the same fencing specifications as the Coastal Rail Trail?

Response: There are at least two rail trails that meet this criteria in California. First, a rail trail has been designed, approved, and currently out to bid in Palo Alto that is located within the CalTrain right-of-way. The trail is within 20 feet of high speed train,

and is fenced. Second, there is a section of rail trail located next to the Southern Pacific Railroad mainline in Sacramento that is located within the railroad right-of-way, also with a fence. Specifics on these and other comparable facilities are being researched at this time.

Question: Is it a general rule that trails located next to active railroads indemnify and provide insurance protection to the railroad?

Response: According to the RTC study, the vast majority (84%) of trail easements do not indemnify or provide insurance protection to the adjacent railroad for incidents that occur outside the trail easement. All rail trails provide their own insurance and complete indemnification to the railroad for incidents that occur within the trail easement, including breaches in fencing. The final arrangement with NCTD will need to be negotiated as part of the implementation process.

Question: If the trail is classified as a recreational facility (as suggested in this report), would that conflict with the fact that the trail is being financed as a commuter transportation facility?

Response: Multi-use trails that are funded for commuter transportation purposes do not preclude use by people for recreational purposes, nor are the uses conflicting. Virtually all multi-use trails such as the Coastal Rail Trail that are funded by transportation funding sources have the goal of reducing vehicle trips to help relieve congestion. This does not conflict with the fact that many trail users will probably be recreational users, and therefore the trail could be defined by that primary use as a recreational facility. In summary, recreational use of the trail does not inhibit the use of the trail by commuters.

Appendix E
Memorandum of Understanding

MTDB Doc. No. L0348.0-98
OPS 940.8 (PC 415)

MEMORANDUM OF UNDERSTANDING

BETWEEN THE CITIES OF OCEANSIDE, CARLSBAD, ENCINITAS, SOLANA BEACH, DEL MAR AND SAN DIEGO AND THE NORTH SAN DIEGO COUNTY TRANSIT DEVELOPMENT BOARD AND SAN DIEGO METROPOLITAN TRANSIT DEVELOPMENT BOARD FOR COORDINATED PLANNING AND DESIGN OF A MULTI-MODAL, NON-MOTORIZED TRANSPORTATION FACILITY WITHIN THE SAN DIEGO NORTHERN RAILWAY FROM SAN LUIS REY RIVER, OCEANSIDE TO THE SANTA FE DEPOT, SAN DIEGO.

WHEREAS, the Cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, and San Diego, are hereinafter referred as Public Agencies; and

WHEREAS, the Public Agencies desire to develop a 42 mile multi-modal, non-motorized transportation facility primarily within the right-of-way of the San Diego Northern Railway, hereinafter referred to as SDNR, from the San Luis Rey River in Oceanside to the Santa Fe Depot in San Diego, hereinafter known as the Coastal Rail Trail; and

WHEREAS, the Coastal Rail Trail will provide alternative transportation opportunities, reduce automobile trips, and thereby improve air quality; and

WHEREAS, the Public Agencies also recognize the regional benefits that a continuous multi-modal, non-motorized transportation facility will have on recreation, tourism, quality of life, and health; and

WHEREAS, the San Diego Association of Governments (SANDAG) has designated the City of Carlsbad as the lead agency in coordinating the planning and design effort for the "Coastal Rail Trail" project and have formalized this action by designating the Coastal Rail Trail within the Regional Transportation Improvement Plan adopted by the SANDAG Board of Directors; and

WHEREAS, the North San Diego County Transit Development Board (NSDCTDB) and the San Diego Metropolitan Transit Development Board (MTDB) own the SDNR right-of way, with North County Transit District (NCTD), the operating entity of NSDCTDB, serving as the managing agency; and

WHEREAS, the SDNR was purchased for use primarily as a rail transportation corridor, hosting a federally designated high speed passenger corridor, as well as rail freight operations and;

WHEREAS, the Public Agencies desire to develop, maintain, and operate the Coastal Rail Trail within the SDNR right-of-way as an ancillary use subordinate to the primary use; and,

WHEREAS, the Public Agencies acknowledge the importance of designing a trail that is safe and is separated from the railway; and,

WHEREAS, the Public Agencies desire to develop the Coastal Rail Trail within the SDNR right-of-way, if feasible due to railway, legal, and land use limitations; and

WHEREAS, in those segments of the San Diego Northern Railway right-of-way not suitable or feasible for the Coastal Rail Trail alignment, the Public Agencies intend to explore alternative alignments utilizing city, state, or federal highway, utility right-of-ways, and private property; and

WHEREAS, the Public Agencies intend to work closely in a cooperative effort with NCTD, MTDB, and other affected local, state, and federal agencies to plan and design the Coastal Rail Trail in portions of the right-of-way not intended for railway and light rail use; and

WHEREAS, the Public Agencies, agree to work cooperatively to develop implementing agreements for the Coastal Rail Trail with affected property owners and to pursue grant funding for construction, operation and maintenance of the Coastal Rail Trail facility.

NOW, THEREFORE, BE IT RESOLVED by the Public Agencies and the Board of Directors of of NSDCTDB and MTDB as follows:

1. That the above recitations are true and correct.

2. That the City Manager of the cities of Oceanside, Carlsbad. Encinitas, Solana Beach, Del Mar, and San Diego, and the General Manager of NSDCTDB and MTDB are hereby authorized to execute, on behalf of each City or Board of Directors, the Memorandum of Understanding regarding the proposed "Coastal Rail Trail"with the Cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, and San Diego and NSDCTDB and MTDB, a copy of which is attached as Exhibit "A" and incorporated by this reference.

CITY OF OCEANSIDE

Dick Lyon, Mayor

Date: 1-13-97

APPROVED AS TO FORM
OCEANSIDE CITY ATTORNEY

CITY OF CARLSBAD

Raymond Patchett, City Manager

Date: 11-7-96

CITY OF ENCINITAS

Lauren Wasserman, City Manager

Date: 11-13-96

CITY OF SOLANA BEACH

Robert Semple, City Manager

Date: 10-25-96

CITY OF DEL MAR

Lauraine Brekke-Esparca, City Manager

Date: 10/18/96

CITY OF SAN DIEGO

Jack McGrory, City Manager

Date: 4-3-97

NORTH COUNTY TRANSIT DISTRICT

Martin Minkoff, Executive Director

Date: 11-21-97

METROPOLITAN TRANSIT DEV. BOARD

Thomas Larwin, General Manager

Date: 1/23/98

Exhibit A
CONCEPTUAL AGREEMENT FOR COORDINATED PLANNING AND DESIGN OF THE COASTAL RAIL TRAIL

The railway from Oceanside to San Diego connect the jurisdictions of the Cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, and San Diego and offers the opportunity to create a 42 mile multi-modal, non-motorized transportation facility known as the Coastal Rail Trail. In order to develop the Coastal Rail Trail and provide a regional benefit, a coordinated effort of the jurisdictions and NSDCTDB and MTDB is required.

WHEREAS, the Cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, and San Diego border or lie within the boundaries of the San Diego Northern Railway right-of-way; and

WHEREAS, the Public Agencies agree that it is their goal, if feasible, to create a continuous multi-modal, non-motorized transportation facility for the benefit of the Public; and

WHEREAS, the Public Agencies are willing to enter into a Memorandum of Understanding to coordinate planning and design of the affecting the "Coastal Rail Trail' project in conjunction with NSDCTDB and MTDB.

NOW THEREFORE, the Public Agencies hereby agree to study, research, coordinate, plan, and design the "Coastal Rail Trail" through coordinated funding, planning, environmental, and design effort to achieve a continuous 42-mile multi-modal, non-motorized transportation facility. This coordinated effort shall include the following:

COORDINATION: The design and planning effort shall be coordinated between the Public Agencies, NSDCTDB, MTDB, and other affected property owners, as well as related agencies including, but not limited to, NAS Miramar, California Public Utilities Commission, California Transportation Commission, California Coastal Commission, U.S. Army Corps of Engineers, California Department of Fish and Game, and the U. S. Department of Fish and Wildlife.

PLANNING: The planning effort shall consider issues related to the development of the Coastal Rail Trail within the railway right-of-way, from the San Luis Rey River in the City of Oceanside to the Santa Fe Depot in the City of San Diego and shall consider alternative alignments or temporary alternative alignments that might be necessary due to railway use, legal, liability, physical or funding constraints.

DESIGN: The design effort shall result in a 30% preliminary engineering design to assist the Public Agencies in developing consistent design standards, and analyzing costs to construct and maintain the Coastal Rail Trail and related facilities.

Appendix F
Sample Agreement For the Use of Portions Railroad Right-of-Way for a Public Trail

FORM OF AGREEMENT

AGREEMENT FOR THE USE OF PORTIONS OF RAILROAD RIGHT-OF-WAY IN THE CITY OF _____

This License Agreement (the "Agreement") is made this ____ day of _____, 199___ between the NORTH SAN DIEGO COUNTY TRANSIT DEVELOPMENT BOARD, owner and operator of the SAN DIEGO NORTHERN RAILWAY ("Railroad"), hereinafter referred to as "NCTD," and the _____, hereinafter referred to as "CITY."

RECITALS

A. CITY desires to use the portion of the Railroad right-of-way (the "Right-of-Way") owned by NCTD and more particularly described in Exhibit 1 attached hereto and made a part hereof (the "Property") for public recreational activities, including, but not limited to, cycling, jogging, and walking.

B. CITY has designed a trail/park (the "Trail") to be developed for public use in the City. The Trail will be configured and located generally as shown on the drawing attached hereto as Exhibit 2 and made a part hereof.

C NCTD and CITY intend the Trail to be a part of the "Coastal Rail Trail" being developed by a number of local cities and agencies in cooperation with NCTD (the "Rail Trail").

NOW THEREFORE, in consideration of the mutual covenants and conditions contained herein, the parties hereto agree as follows:

1. Grant of Use Rights. NCTD hereby agrees to allow the CITY to use the Property for the purposes described in Section 3, below, subject to (1) all preexisting rights, interests and

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easements affecting use of the Property and (2) all rights, interests and easements affecting use of the Property granted or conveyed by NCTD during the term of this Agreement that do not more than minimally interfere with CITY's use of the Property, and upon the terms and conditions set forth in this Agreement, for a term of fifty (50) years beginning on _____, 199__ (the "Commencement Date") and ending on_____, 204__ or at an earlier date as is hereinafter provided (the "Term").

2. Payment of Use Fee. CITY shall pay a use fee to NCTD in the sum of one dollar ($1.00) as partial consideration for the use of the Property, payable in advance, on the first day of the Term.

3. Permitted Use.

3.1 During the Term, the Property shall be used for the exclusive purpose of the construction, maintenance and operation of the Trail, and for uses normally incident to that purpose. CITY shall not use or permit the Property to be used for any other purpose without the prior written consent of NCTD. CITY shall not commit or permit the commission by others of any damage, nuisance or waste on the Property. CITY shall not place or permit to be placed upon the Property any gasoline or any hazardous or explosive material, waste or substance. CITY's use of the Property shall not interfere with any railroad operations on the Right-of-Way.

3.2 If CITY, its successors or assigns, shall use the Property for any purpose other than as stated in this Section 3, or fails to act in strict accordance with the provisions of this Agreement, then NCTD shall provide CITY with a timely written notice of any claim of default, meet and confer with CITY regarding said claim of default, and allow CITY an opportunity to cure said default so long as CITY proceeds expeditiously to cure said default. If CITY fails to

cure said default in a timely manner, NCTD may exercise its remedies at law or equity against CITY.

3.3 No vehicular or pedestrian crossing over NCTD's tracks shall be installed or used by CITY without the prior written permission of NCTD.

3.4 CITY shall cooperate with NCTD and other local agencies in the development and operation of the Rail Trail and shall permit the use of the Trail as a part of the Rail Trail under such terms and conditions as are approved by CITY, which approval shall not be unreasonably withheld.

3.5 It is expressly understood and agreed by CITY that CITY shall use the Property without interference or damage to the pipe lines, electric transmission lines, telephone lines, other communications facilities and other facilities of like character, existing or constructed during the Term of this Agreement over, under, along and across the Property or the adjacent NCTD Right-of-Way. CITY hereby agrees that it will indemnify and save harmless NCTD and its licensees and invitees from and against any and all liability for any such interference or damage.

4. Development Standards. The use of the Property for the Trail shall be subject to the following development standards:

4.1 The landscaping of the Property shall be subject to the following conditions and restrictions:

(a) No sprinklers or irrigation waters are permitted within the Right-of-Way outside of the Property;

(b) Adequate drainage must be provided for the Property so that at all times all water shall flow away from the rails and ties and other railroad facilities; and,

(c) No vertical obstruction shall be permitted within 25 feet of the center line of the railroad tracks. Trees and shrubs must be planted more than 25 feet from the center line of the railroad tracks. However, no tree limbs shall encroach into that area which is 12 ½ feet from the center line of the railroad tracks and no tree shall be placed or allowed to grow so as to create a risk of a tree or tree limb falling onto the railroad tracks.

4.2 Portions of the Trail, including the pedestrian path, may be lighted and in no instance shall any vertical object be closer than 25 feet from the center line of the railroad tracks.

4.3 CITY, at its own discretion and expense, shall install signage in connection with the Trail, subject to the prior approval of NCTD concerning the size and location of any signage. In no instance shall any signage be closer than 25 feet from center line of the railroad tracks.

4.4 CITY shall construct some form of barrier, the design of which shall be approved by NCTD, between the Trail and the railroad track and facilities to prevent users of the Trail from entering onto the portion of the Right-of-Way that is not the Property.

5. Construction Matters.

5.1 CITY agrees that all work to be done hereunder by CITY and/or its contractors in the construction and/or maintenance of improvements on the Property shall be performed in a good and workmanlike manner and in accordance with plans and specifications approved by NCTD, which approval shall concern only those matters occurring on, within or under the Property and are related to railroad operations, improvements or equipment. Only those changes or modifications during construction that affect the Property and/or are related to rail related operations, improvements or equipment shall be subject to approval by NCTD, which approval

shall not be unreasonably withheld or delayed. All work performed on, over, or under the Property shall be done to the satisfaction of NCTD.

5.2 In the construction of the Trail CITY shall require its contractor, at the contractor's expense, to:

(a) obtain a Right-of Entry Permit from NCTD, a copy of which is attached hereto as Exhibit "3," and

(b) procure and maintain in force at all times during the construction of the Trail, and for additional periods as described in the specifications for the construction of the Trail, the insurance required by the Right-of- Entry Permit.

5.3 CITY shall reimburse NCTD within 30 days of invoice for all costs and expenses incurred by NCTD (including a 7.2% administrative fee) in connection with the planning, design and construction of the Trail including, but without limitation, consultants fees, mark out of railroad facilities, the expense of furnishing inspectors, security and flag protection as NCTD deems necessary, the installation and removal of false work beneath tracks, equipment rentals and restorations of the Right-of-Way.

5.4 Flag protection shall be required when construction of the Trail and/or CITY's operations on or adjacent to the Right-of-Way present a danger to NCTD's rail facilities. NCTD shall determine the need for Flag Protection in its sole discretion. CITY agrees to execute time cards as required by NCTD personnel providing Flag Protection services.

5.5 The following individuals shall be contacted prior to the start of construction of the Trail and shall be the CITY's contacts regarding work on the Property:

(a) NCTD Contacts. Contact Noel Peck at (619) 967-2868 (810 Mission Ave., Oceanside, CA 92054) or Chip Willett at (619) 966-6504 (810 Mission Ave., Oceanside, CA 92054) at least 7 days prior to the start of any work on the Right-of-Way.

(b) MCI Contact. Contact Lowell Hardy of MCI Telecommunications Corporation at 905 East Discovery Lane, Anaheim, CA 92801 (310) 608-1939 prior to any excavation in the Right-of-Way.

(c) MFS Contact. Contact Thomas Stames of Price Technical Services at 7121 Engineer Rd., San Diego, CA 92111 ((619) 277-3222) prior to any excavation in the Right-of-Way.

5.6 NCTD shall have the right to enter the Property to post notices of non-responsibility. CITY shall not permit any mechanics' or other liens to be filed against the Property nor against CITY's interest herein by reason of labor and materials furnished to the Property at CITY's insistence or request. If any such lien is filed against the Property, CITY shall cause the same to be discharged of record, either by payment of the claim or by posting and recording the bond contemplated by California Civil Code 3143, within twenty (20) days after demand by NCTD. CITY shall indemnity, hold harmless and defend NCTD from and against any such lien.

5.7 The requirements stated in this Agreement related to the construction of the Trail shall be specifically identified in any project specifications and bidding documents prepared by

CITY for the construction of all or any part of the Trail, and shall be subject to approval by NCTD.

5.8 Any contractor or subcontractor performing work on, or in connection with the CITY's use of or entry onto the Property pursuant to this Agreement, shall be conclusively deemed to be the servant and agent of CITY, acting on behalf and within the scope of such contractor's or subcontractor's employment for CITY and subject to the provisions of this Agreement.

5.9 Any and all construction work performed or caused to be performed by CITY on the Property shall be performed in accordance with any and all applicable laws, rules and regulations including, but not limited to, the AMERICAN RAILWAY ENGINEERING ASSOCIATION'S MANUAL FOR RAILWAY ENGINEERING, current edition, and such rules and regulations as are established by NCTD. CITY shall submit work plans to NCTD for review and written approval. Any such Work must be carried out pursuant to work plans approved in writing by NCTD. In addition, flag protection shall be required and paid for by the CITY when CITY's use of the Property presents, in the opinion of NCTD, a potential danger to rail operations on the right-of-way. NCTD shall determine the need for Flag Protection in its sole discretion.

6. Maintenance.

6.1 CITY acknowledges and agrees that NCTD shall have no obligation whatsoever to maintain or repair the Property. CITY shall be solely responsible for maintenance and repair of all improvements constructed on the Property and all costs in connection therewith, including, but not limited to, the repair, resurfacing and resealing of the pedestrian path and the watering and maintenance of landscaping, as necessary. CITY shall perform all maintenance and clean-up of

the Property and the improvements thereon as necessary to keep both in good order and a safe condition and in accordance with all applicable Federal and state laws and regulations.

6.2. CITY acknowledges that the use of Property (including the pedestrian path) by NCTD and others entities having rights to use the Right-of-Way is necessary for the maintenance and repair of the improvements, facilities and equipment on or within the Right-of-Way. Accordingly, NCTD, and its agents, invitees, licensees and employees, shall have the right at any time to barricade any portion of the Property and prevent public use thereof on a temporary basis as NCTD deems necessary for the duration of repair work. In the event such barricading is installed, NCTD shall provide prompt notice to CITY by phone or telefax and in accordance with Section 17, below. In the exercise of rights under this Section 6.2, NCTD shall ensure that adequate precautions are provided for the protection of authorized Trail users.

7. Duty of Care of NCTD As To Improvements. NCTD shall exercise all reasonable care and precaution in the normal course of its business to avoid damaging the Trail improvements constructed on the Property by CITY.

8. Indemnity.

8.1 In addition to and without limitation on any other provision of this Agreement, CITY hereby agrees to investigate, defend, with counsel approved by NCTD (should special counsel be deemed necessary by CITY), indemnify and hold NCTD, and its members, officers, agents and employees, harmless from and against any and all loss, damage, liability, claims, demands, detriments, costs, charges and expenses (including attorneys' fees) and causes of action of whatsoever character which NCTD may incur, sustain or be subject to on account of loss of or damage to or destruction of property and loss of use thereof, or for bodily injury to or death of

any persons (including, but not limited to property, employees, subcontractors, agents, servants and invitees of NCTD, or any other person to whom a duty of care is owed), arising out of or in any way related, in whole or in part, to (i) the condition of the Property, (ii) the use of the Property by the CITY, including, but not limited to, the authorized or unauthorized use of the Trail by any person, or (iii) the use of the Property by the general public for cycling, jogging, walking, or other activities, whether or not such loss, damage, destruction, loss of use, injury or death was jointly caused by or contributed to by, and irrespective of any negligence or alleged negligence, active passive or otherwise, by NCTD, its officers, agents, servants or employees.

8.2. CITY further agrees to indemnity and hold NCTD, and its members, officers, agents and employees harmless from and against any and all liability, costs, charges, penalties and expenses, including reasonable attorneys' fees, which NCTD may incur as a result of or in connection with claims, demands, or action by any governmental entity or other party arising out of or alleged to have arisen out of railroad operations, including, but not limited to, any release or discharge of any toxic, flammable noxious or other hazardous material, including fumes, onto, under, over, or within the air space of the Property or any part thereof, or any pond, landscaping or other elements of the Trail.

8.3. This indemnity shall not apply in cases of willful, gross, wanton or criminal negligence on the part of NCTD or its members, officers, agents, servants or employees.

9. Condition of the Property.

9.1 CITY warrants that it has inspected the Property and accepts the Property in an "AS IS, WHERE IS CONDITION, WITHOUT WARRANTY AS TO QUALITY, CHARACTER, PERFORMANCE OR CONDITION" with all fault and with full knowledge of

(i) the physical condition of the Property, (ii) all zoning and other land use laws and regulations affecting the Property, (iii) all matters of record relating to the Property and (iv) all other conditions, restrictions, encumbrances relating to the Property.

9.2 CITY hereby recognizes and acknowledges that railroad tracks are located on or adjacent to the Property. CITY recognizes that the current and potential expanded future operation of trains over the Right-of-Way does and will produce vibrations, fumes, visual impacts and noise levels which may be considered objectionable by the employees, agents, residents or invitees of the CITY. With knowledge and understanding of these facts CITY hereby accepts the Property as provided in this Article 9 and agrees that no legal action or complaint of any kind whatsoever shall be instituted against NCTD or other authorized users of the Right-of-Way by CITY or on CITY's behalf as result of such vibrations, fumes, visual impacts and noise levels or as a result of the operation of the Right-of-Way.

10. Utilities. CITY shall arrange and pay before delinquency all charges for utilities, including without limitation, water, power, heat, garbage, communications and sewer services reasonably necessary to conduct CITY's permitted use of the Property under this Agreement.

11. Relocation of Facilities. If at any time NCTD in its judgment decides that, due to the construction or relocation of a railroad facility or equipment, any part of the improvements and appurtenances constructed pursuant to the terms of this Agreement needs to be relocated it shall provide a written sixty (60) day notice to CITY or its assignee(s). Thereafter, CITY and NCTD will informally meet and confer to discuss the allocation of the cost of relocating the affected public improvements and appurtenances. In the event that the parties cannot agree on the

allocation of the cost of relocating the affected public improvements and appurtenances the parties shall submit the matter to mediation with a mediator agreed to by the parties.

12. Insurance.

12.1 In addition to the insurance required in Paragraph 5.2, above, at all times while this Agreement is in effect, CITY shall, at its sole expense, maintain comprehensive general liability insurance written through an insurance company having a Best's rating of B+ 13 or better and licensed to do business in the State of California, meeting the requirements stated in this Article 12 in a form satisfactory to NCTD for not less than a policy amount of Two Million Dollars ($2,000,000) (stated on a per occurrence bases).

12.2 The policy of comprehensive general liability insurance required by Paragraph 12.1 shall include the following provisions:

(a) The insurance shall be primary, without right of contribution from other insurance which may be in effect;

(b) The insurance shall not be invalidated by the acts or omissions of other insureds;

(c) The insurance shall not be modifiable or cancelable or non-renewable without 30 days' prior written notice to NCTD (except in the case of cancellation for nonpayment of premium in which case cancellation shall not take effect until at least 10 days notice has been given to NCTD). This provision is hereinafter referred to as "Notice of Modification or Cancellation";

(d) NCTD and its members, employees and agents shall be named as an additional insured as its interests may appear;

(e) The insurance shall cover contractual liabilities of CITY and NCTD, including, but not limited to this Agreement;

(f) The insurance shall include comprehensive property and personal injury endorsements; and

(g) The insurance shall include a severability of interest clause.

12.3 Any umbrella or excess liability insurance will provide that if the underlying aggregate is exhausted, the excess coverage will drop down as primary insurance and will provide for Notice of Modification or Cancellation.

12.4 All policy or endorsement limitations relating specifically to operations on or near railroad property or track(s) shall be eliminated.

12.5 A properly completed certificate of insurance executed by an authorized representative of the insurer or insurers and a certified copy of the policy or policing shall be furnished to NCTD prior to the Commencement Date and no later than thirty (30) days prior to expiration of any insurance policy. In the event CITY fails to comply with this requirement, NCTD may, but shall not be obligated to, obtain such insurance and keep the same in effect and, upon demand, CITY shall pay to NCTD the premium cost thereof.

12.6 The requirements as to the types and limits of insurance coverage to be maintained by CITY as required by this Article 12, and any approval of said insurance by NCTD and/or its agents, are not intended to and shall not in any manner limit or qualify the liabilities and

obligations otherwise assumed by CITY pursuant to this Agreement, including but not limited to, the provisions concerning indemnification contained in Article 8 of this Agreement.

12.7 CITY shall notify NCTD within twenty-four (24) hours after the occurrence of any accident or incident on the Property or adjacent property which could give rise to a claim under any of the insurance policies required hereunder.

12.8 Notwithstanding any other provision of this Agreement, the CITY may self-insure for any risk set forth in this Article 12 in the manner and to the extent that the CITY self-insures for similar risks with respect to its operations, equipment and property. The manner in which such self-insurance is provided and the extent of such self-insurance shall be set forth in a Certificate of Self Insurance, delivered to NCTD and signed by an authorized representative of CITY, which fully describes the self-insurance program and how the program covers the risks set forth in this Article 12. NCTD shall have the right to consent to CITY's self-insurance program and any change made by CITY in its self-insurance program when any such change would affect the coverage required by this Article 12, which consent shall be given in the event that such change will not materially, adversely affect NCTD. If at any time during the term of this Agreement the CITY elects to not self-insure, the CITY will comply with all applicable provisions of this Article 12 to the extent it does not so self-insure.

13. Termination. This Agreement may be terminated: (1) at any time upon the mutual agreement of NCTD and the CITY or (2) as provided in paragraph 3.2, above. Upon termination of this Agreement, CITY shall leave the Property in a neat and safe condition and all repairs, alterations, additions and improvement, made by CITY on the Property pursuant to this Agreement shall be the property of NCTD and remain on the Property. However, NCTD may, at

NCTD's option, by thirty (30) day written notice of its intent to terminate, require CITY to remove any such alterations and improvements from the Property and to restore the Property to its original condition (normal wear and tear excepted) prior to termination of this Agreement at CITY's sole cost and expense. If CITY fails to do so, NCTD may perform such removal and restoration in which case CITY shall pay NCTD within thirty (30) days after demand therefor the cost of removal of such improvements. NCTD will use reasonable diligence in the removal of such improvements if it elects to do so. Termination of this Agreement shall not release either party from any liability or obligation hereunder resulting from an event which occurred before termination.

14. Reserved Freight Easement and Other Railroad Uses. CITY acknowledges that the Property (and the rights granted to CITY by this Agreement) is subject to a reserved freight easement in favor of The Burlington Northern and Santa Fe Railway Company as successor by merger to the Santa Fe and the terms and conditions of the San Diego County Shared Use Agreement by and between MTDB, NCTD and the Santa Fe dated October 30, 1992 as well as other rights and agreements that NCTD has entered into, or may enter into in the future concerning the use of the Right-of-Way for railroad purposes.

15. Attorney's Fees. If any party to this Agreement brings any action against the other to enforce any provisions of this Agreement, collect any sum due under this Agreement, or if NCTD brings an action for unlawful detainer of the Property, the losing party shall pay reasonable attorney's fees of the prevailing party in addition to the judgement and court costs.

16. Nonwaiver. The failure of any party to this Agreement to enforce or exercise its rights with respect to any term, covenant or condition of this Agreement shall not be construed as a

waiver of that term, covenant or condition for any subsequent breach of the same or any other term, covenant or condition contained in this Agreement.

17. Notices. All notices shall be in writing and shall be deemed to have been given when delivered personally or deposited in the United States Mail, registered or certified, postage prepaid, and addressed to the party to whom the notice is directed at the address set forth below.

To NCTD at: North County Transit District
810 Mission Avenue
Oceanside, CA 92054
Attn: Right-of-Way Liaison

or to such other address as NCTD may designate by written notice to the other parties to this Agreement.

To CITY at: _____
_____
_____

or to such other address as CITY may designate by written notice to the other parties to this Agreement.

18. Entire Agreement. This Agreement sets forth the entire agreement between the parties with respect to the License of the Property and supersedes all prior agreements, communications, and representations, oral or written, express or implied, since the parties intend that this be an integrated agreement. This agreement shall not be modified except by written agreement of the parties.

19. Invalidity of Particular Provisions. If any term, covenant or condition of this Agreement or the application thereof to any person or circumstance shall to any extent be invalid or unenforceable, the remainder of this Agreement or the application of such term, covenant or

condition to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term, covenant and condition of this Agreement shall be valid and be enforced to the fullest extent permitted by law.

20. Successors. This Agreement shall bind and inure to the benefit of both NCTD and CITY and their respective successors, heirs and legal representatives.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first above written.

CITY OF _____

By_____

Approved as to form:

_____
City Attorney

NORTH SAN DIEGO COUNTY TRANSIT
DEVELOPMENT BOARD

By _____

Approved as to form:

_____
General Counsel
North San Diego County Transit Development Board

APPENDIX G
Acronym Reference Guide

Acronym Reference Guide

AASHTO	American Association of State Highway & Transportation Officials
ACOE	Army Corps of Engineers
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
APCD	Air Pollution Control Board
APZ	Accident Protection Zone
AT&S.F.	Atchison Topeka & Santa Fe Railroad
BA	Biological Assessment
BFA	Bicycle Federation of America
BRAC	Base Close & Realignment Act
CAA	Clean Air Act
CalTrans	California Department of Transportation
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CMAQ	Congestion Management Air Quality
CNDDB	California Natural Diversity Database Search
CPUC	California Public Utilities Commission
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FHA	Federal Highway Administration
FRA	Federal Railway Administration
ISTEA	Intermodal Surface Transportation Efficiency Act
ITE	International Transportation Engineers
LCP	Local Coastal Program
MHCP	Multiple Habitat Conservation Program
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MSCP	Multiple Species Conservation Program
MTDB	Metropolitan Transit Development Board
MUTCD	Manual for Uniform Traffic Control Devices
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection & Repatriation Act
NARFA	National American Religious Freedom Act
NCCP	Natural Communities Conservation Plan
NCTD	North County Transit District
NHPA	National Historic Preservation Act
NSDCTDB	North San Diego County Transit Development Board
NEPA	National Environmental Protection Act
NRHP	National Register of Historic Places

PSR	Project Study Report
RTC	Rails to Trails Conservancy
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
RWCQB	Regional Water Quality Control Board
RUS	Recreational Use Statute
SANDAG	San Diego Association of Governments
SDNR	San Diego Northern Railway
SHPO	State Historic Preservation Office
SRP	Scientific Review Panel
TSM	Transportation System Management
USDOT	United States Department of Transportation
US.F.WS	United States Fish and Wildlife Service

APPENDIX H
FUNDING SUMMARY

Funding Summary

Funding Program:	**Transportation Equity Act for the 21st Century (TEA- 21)**
Funding Type:	Federal
Summary Description:	TEA-21 provides funding for roads, transit, safety and environmental enhancements. General state and local improvements for highways and bridges that accommodate additional modes of transit. Including, capital costs, publicly owned intercity facilities, and bicycle and pedestrian facilities.
Eligible Applicants:	Cities, counties, transit operators. Special districts may apply with sponsorship from an eligible applicant.
Typical Funding Amounts:	Estimated at approximately $215 billion over the next 6 years, an increase of approximately $60 billion over ISTEA legislation.
Required Matching Funds:	A 11.5% match is required.
Name of Funding Program:	**Surface Transportation Program Fund (STP) (Section 1108)**
Funding Type:	Federal
Summary Description:	The Surface Transportation Program is a block grant fund. Funds are used for roads, bridges, transit capital and pedestrian and bicycle projects.
Eligible Applicants:	Cities, counties, transit operators, Caltrans and Metropolitan Planning Organizations. Non-profit organizations and special districts may also apply with sponsorship from an eligible agency.
Typical Funding Amounts:	Approximately $535 million annually.
Required Matching Funds:	A local match of 20% is required for bicycle and pedestrian projects, 11.5% is required for all other types of projects.
Name of Funding Program:	**Transportation Enhancements Program**
Funding Type:	Federal
Summary Description:	The TE Program is a 10% set aside of the Surface Transportation Program. Projects must have a direct relationship to the intermodal transportation system through function, proximity, or impact.
Eligible Applicants:	Local, regional and state public agencies, special districts, non-profit and private organizations. Cities, counties and transit operators must sponsor and administer the proposed projects.
Typical Funding Amounts:	Approximately $630 million annually.
Required Matching Funds:	A 11.5% local match is required.
Name of Funding Program:	**Congestion Mitigation and Air Quality Improvement Program (CMAQ) (Section 1110)**
Funding Type:	Federal
Summary Description:	Funds are available for projects that will help attain National Ambient Air Quality Standards (NAAQS) identified in the 1990 federal Clean Air Act Amendments. Eligible projects include bicycle and pedestrian transportation facilities.
Eligible Applicants:	Cities, counties, transit operators, Caltrans and MPOs. Non-profit organizations and Special districts may also apply with sponsorship from an eligible agency.
Typical Funding Amounts:	Approximately $277 million annually.
Required Matching Funds:	A 20% local or state match is required.
Name of Funding Program:	**National Highway System Fund (NHS)**
Funding Type:	Federal
Summary Description:	NHS funds are to provide for an interconnected system of principal arterial routes. The programs goal is to provide access to major population centers, international border crossings, transportation systems, meet national defense requirements and serve interstate and interregional travel, which includes access for bicyclists and

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pedestrians. Facilities must be located and designed pursuant to an overall plan developed by each MPO and State, and incorporated into the RTIP.

Eligible Applicants: State and local governments.
Typical Funding Amounts: Approximately $441 million annually.
Required Matching Funds: A local or state match of 20% is required.

Key Changes in TEA-21: NHS funds can now be spent on nonmotorized projects within Interstate corridors. (Section 1202)
Contact: IVAG (refer to Appendix A)

Name of Funding Program: **Federal Lands Highway Program Fund**
Funding Type: Federal
Summary Description: This Discretionary Program provides funding for any kind of transportation project (including pedestrian and bicycle facilities) that are within, provide access to or are adjacent to public lands. Facilities must be incorporated into the RTIP.

Eligible Applicants: Local jurisdictions, Caltrans, Bureau of Land Management (BLM), and the National Trail System Program.
Typical Funding Amounts: Approximately $150 million per annum rising to $165 million in FY 2003.
Required Matching Funds: No match required.

Name of Funding Program: **Scenic Byways Program Fund**
Funding Type: Federal
Summary Description: This program provides funding for the planning, design, and development of a State Scenic Byways Program. Funds may be used for the construction of facilities along the highway for the use of pedestrians and bicyclist, including pedestrian/bicycle access, safety improvements, and rest areas.

Eligible Applicants: Local government agencies.
Typical Funding Amounts: Approximately $10 million annually state-wide.
Required Matching Funds: A 20% local match is required.

Name of Funding Program: **Bridge Repair and Replacement Program**
Funding Type: Federal
Summary Description: Funds are available for bridge rehabilitation and replacement. All bridges are eligible, and on-system bridges are eligible for discretionary funding. Bridge projects must be incorporated into the RTIP.

Eligible Applicants: City and county agencies, park and recreation districts. All agencies must have a city, county or transit operator as a sponsor.
Typical Funding Amounts: Approximately $260 million annually.
Required Matching Funds: No local match requirements specifically for bicycle accommodations.

Name of Funding Program: **National Recreational Trails Fund (Section 1112)**
Funding Type: Federal
Summary Description: Funds are available for recreational trails for use by bicyclists, pedestrians, and other non-motorized and motorized users. Projects must be consistent with a Statewide Comprehensive Outdoor Recreation Plan (SCORP). Annual funding begins at $30 million for FY 1998, it rises to $40 million for FY 1999 and increases to $50 million per annum for the remaining years.

Eligible Applicants: Private individuals or organizations, counties, cities, and other government agencies.
Typical Funding Amounts: Approximately $3 million annually.
Required Matching Funds: The State is required to use a portion of its tax revenue from fuel for off-highway recreation purposes.

Name of Funding Program: **National Highway Safety Act (Section 402)**
Funding Type: Federal

Summary Description:	The Highway Safety Program is a non-capital safety project grant program under which states may apply for funds for certain approved safety programs and activities. Eligible projects include pedestrian and bicycle safety programs, program implementation, and identification of highway hazards.
Eligible Applicants:	State departments, cities, counties, school and special districts.
Typical Funding Amounts:	Approximately $150 million per annum rising to $165 million in FY 2003.
Required Matching Funds:	No match required.
Name of Funding Program:	**Transit Enhancement Activity (Section 3003)**
Funding Type:	Federal
Summary Description:	This brand new program is created with a one percent set-aside of Urban Area Formula transit grants (3007). The funding which could amount to $50 million per year, can be used for among other things bicycle and pedestrian access to mass transportation.
Eligible Applicants:	Pending.
Typical Funding Amounts:	Formula is pending.
Required Matching Funds:	A 5% match required.
Name of Funding Program:	**Highway Safety, Research, and Development Fund (Section 2003)**
Funding Type:	Federal
Summary Description:	Provides funding for research on all phases of highway safety and traffic conditions. Uses, training and education of highway safety personnel, research fellowships in highway safety, development of improved accident investigation procedures, emergency service plan, and demonstration projects. Projects include improving pedestrian safety through education, police enforcement, and traffic engineering. Projects must be incorporated into the RTIP.
Eligible Applicants:	Cities, counties, and state agencies. Programs are often run by local community traffic safety programs.
Typical Funding Amounts:	
Name of Funding Program:	**Schools and Roads Grants to States**
Funding Type:	Federal
Summary Description:	Funds are used public roads and schools that are located in the same county as a National Forest.
Eligible Applicants:	Cities and counties containing National Forest Land.
Typical Funding Amounts:	Formula grants are 25% of the receipts collected from timber and land use fees to the respective counties. Fifty percent of these funds are used for roads.
Required Matching Funds:	No match required.
Name of Funding Program:	**Section 3 Mass Transit Capital Grants**
Funding Type:	Federal
Summary Description:	This discretionary funding program is used to finance mass transit systems, especially rail systems in urbanized areas with populations over 50,000 or more. Projects include station access, including bicycle and pedestrian access, and American with Disabilities Act projects, implementation of shelters, bicycle parking facilities, racks, and other equipment for transporting bicycles on transit vehicles.
Eligible Applicants:	States, regional and local governments, appropriate boards and commissions, and transit operators.
Typical Funding Amounts:	
Required Matching Funds:	A local match of 10% is required for bicycle projects, 5% for ADA projects.
Procedure for Project	Projects must be included in the RTIP. Congress
Name of Funding Program:	**Section 9 Mass Transit Formula Grants**
Funding Type:	Federal

Summary Description:	Eligible projects include construction, maintenance, improvement, and acquisition of transit facilities and access projects for bicycles.
Eligible Applicants:	Urban areas with a population of 50,000 or more are eligible if a comprehensive mass transportation planning process exists. State, and local governments, and transit operators are eligible. Public and private non-profit organizations are eligible for subgrants. Projects must be consistent with the RTP and must be incorporated into the RTIP.
Required Matching Funds:	A local match of 10% is required for bicycle projects.
Name of Funding Program:	**Local Transportation Fund (LTF), TDA Article 3**
Funding Type:	State
Summary Description:	TDA funds transportation improvements. One quarter cent of retail sales tax is returned to the county of origin. Up to two percent of funds can be set aside for pedestrian and bicycle facilities, and five percent can be spent for supplementing other funds to implement bicycle safety education programs. 2% TDA funds are lumped together with TransNet (Proposition A) funds in the San Diego Area.
Eligible Applicants:	Local jurisdictions.
Typical Funding Amounts:	Approximately $2.5 million annually, of which 1 million comes from TransNet (Proposition A).
Required Matching Funds:	No matching funds are required.
Name of Funding Program:	**California Bicycle Transportation Act; Bicycle Transportation Account (BTA)**
Funding Type:	State
Summary Description:	The purpose of the Bicycle Transportation Account is to improve the safety and convenience of bicycling for utilitarian reasons. BTA funds are available for jurisdictions with approved bicycle transportation plans. No agency may receive more than 25% of the total funds appropriated. Priority projects serve bicycle commuters, have activity centers at each end point, are consistent with the bicycle plan/program, and close missing links. Projects must be consistent with local Bikeway Plans, the RTP and incorporated into the RTIP if projects are regionally significant.
Eligible Applicants:	Cities and counties with approved bicycle plans.
Typical Funding Amounts:	$12million for a 5 year period 2001-2006..
Required Matching Funds:	A local match of 10% is required.
Name of Funding Program:	**Environmental Enhancement and Mitigation Program**
Funding Type:	State
Summary Description:	Funds are allocated to projects that offset environmental impacts of modified or new public transportation facilities and the acquisition or development of roadside recreational facilities, such as trails.
Eligible Applicants:	Non-profit, local, state, and federal agencies.
Typical Funding Amounts:	The program is funded at $10 million for 10 years, a $500,000 cap on individual projects is set.
Required Matching Funds:	No match required.
Name of Funding Program:	**Flexible Congestion Relief (FCR) Program**
Funding Type:	State
Summary Description:	This program is designed to reduce congestion on major transportation corridors by adding capacity to either roadways or urban rail transit systems. Projects must be consistent with the Regional Transportation Plan and must be included in the RTIP, particularly, the county's Congestion Management Program (CMP).
Eligible Applicants:	Cities, counties, transit operators, Caltrans, and other state and federal agencies.
Typical Funding Amounts:	Approximately $300 million annually state-wide.
Required Matching Funds:	No match required.

Name of Funding Program:	**Habitat Conservation Fund Grant Program**
Funding Type:	State
Summary Description:	This program originates from the California Wildlife Protection Act of 1990 (Prop 117). Eligible projects include the acquisition of various types of wildlife habitats, enhancement and restoration of various Projects must be incorporated into the RTIP if they are regionally significant.
Eligible Applicants:	Cities, counties, and special districts.
Required Matching Funds:	A local match of 50% is required. The local match can not be a state source.
Name of Funding Program:	**Land and Water Conservation Fund**
Funding Type:	State
Summary Description:	This program provides grants to plan, acquire, and develop recreational parks and facilities, especially in urban areas. Funds are based on a State Comprehensive Outdoor Recreation Plan, and limited to outdoor recreational projects.. Projects must be incorporated into the RTIP if they are regionally significant.
Eligible Applicants:	Cities, counties, park and recreation departments, special districts with park and recreation areas, State Department of Parks and Recreation, Wildlife Conservation Board, Department of Water Resources, and Department of Boating and Waterways.:
Required Matching Funds:	50% is reimbursed to eligible agencies.
Name of Funding Program:	**TransNet Local Sales Tax Program (Proposition A)**
Funding Type:	Local
Summary Description:	Proposition A is a local sales tax to fund transportation improvements. The tax generates $1 million annually. The funds are used to augment the available TDA funds. Proposition A funds are lumped with 2% TDA funds.
Eligible Applicants:	Cities, County, and Transportation Agencies.
Typical Funding Amounts:	1 million annually.
Required Matching Funds:	No match required.
Name of Funding Program:	**Transportation Fund for Clean Air (TFCA)**
Funding Type:	Regional
Summary Description:	Clean Air Funds are generated by a surcharge on automobile registration. Approximately $3 million is available biannually. These funds are competitive based on the projects cost effectiveness.
Eligible Applicants:	Cities, County, Transportation Authority, and Transportation Agencies.
Typical Funding Amounts:	Approximately $3 million region-wide for FY 2000-01.
Required Matching Funds:	No matching funds required.

APPENDIX I
CALTRANS
HIGHWAY DESIGN MANUAL
CHAPTER 1000 "BIKEWAY PLANNING AND DESIGN"

CHAPTER 1000 BIKEWAY PLANNING AND DESIGN

Topic 1001 - General Information

Index 1001.1 - Definitions

"Bikeway" means all facilities that provide primarily for bicycle travel.

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

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

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

1001.2 Streets and Highways Code References - Chapter 8 - Nonmotorized Transportation

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

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

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

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

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

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

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

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

(i) Section 891 -- Local agencies must comply with design criteria and uniform symbols.

(j) Section 892 -- Use of abandoned right-of-way as a nonmotorized facility.

1001.3 Vehicle Code References - Bicycle Operation

(a) Section 21200 -- Bicyclist's rights and responsibilities for traveling on highways.

(b) Section 21202 -- Bicyclist's position on roadways when traveling slower than the normal traffic speed.

(c) Section 21206 -- Allows local agencies to regulate operation of bicycles on pedestrian or bicycle facilities.

(d) Section 21207 -- Allows local agencies to establish bike lanes on non-state highways.

(e) Section 21207.5 -- Prohibits motorized bicycles on bike paths or bike lanes.

(f) Section 21208 -- Specifies permitted movements by bicyclists from bike lanes.

(g) Section 21209 -- Specifies permitted movements by motorists in bike lanes.

(h) Section 21209 -- Prohibits bicycle parking on sidewalks unless pedestrians have an adequate path.

(i) Section 21210 -- Prohibits impeding or obstruction of bicyclists on bike paths.

(j) Section 21212 -- Requires a bicyclist under 18 years of age to wear an approved helmet.

(k) Section 21717 -- Requires a motorist to drive in a bike lane prior to making a turn.

(l) Section 21960 -- Use of freeway shoulders by bicyclists.

Topic 1002 - General Planning Criteria

1002.1 Introduction

Bicycle travel can be enhanced by improved maintenance and by upgrading existing roads used regularly by bicyclists, regardless of whether or not bikeways are designated. This effort requires increased attention to the right-hand portion of roadways where bicyclists are expected to ride. On new construction, and major reconstruction projects, adequate width should be provided to permit shared use by motorists and bicyclists. **On resurfacing projects, the entire paved shoulder and traveled way shall be resurfaced. When adding lanes or turn pockets, a minimum 1.2 m shoulder shall be provided (see Topic 405 and Table 302.1).** When feasible, a wider shoulder should be considered. When placing a roadway edge stripe, sufficient room outside the stripe should be provided for bicyclists. When considering the restriping of roadways for more traffic lanes, the impact on bicycle travel should be assessed. Bicycle and pedestrian traffic through construction zones should be addressed in the project development process. These efforts, to preserve or improve an area for bicyclists to ride, can benefit motorists as well as bicyclists.

1002.2 The Role of Bikeways

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

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

1002.3 The Decision to Develop Bikeways

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

1002.4 Selection of the Type of Facility

The type of facility to select in meeting the bicycle need is dependent on many factors, but the following applications are the most common for each type.

(1) Shared Roadway (No Bikeway Designation). Most bicycle travel in the State now occurs on streets and highways without bikeway designations. This probably will be true in the future as well. In some instances, entire street systems may be fully adequate for safe and efficient bicycle travel, and signing and striping for bicycle use may be unnecessary. In other cases, routes may be unsuitable for bicycle travel, and it would be inappropriate to encourage additional bicycle travel by designating the routes as bikeways. Finally, routes may not be along high bicycle demand corridors, and it would be inappropriate to designate bikeways regardless of roadway conditions (e.g., on minor residential streets).

Many rural highways are used by touring bicyclists for intercity and recreational travel. In most cases, it would be inappropriate to designate the highways as bikeways because of the limited use and the lack of continuity with other bike routes. However, the development and maintenance of 1.2 m paved roadway shoulders with a standard 100 mm edge stripe can

significantly improve the safety and convenience for bicyclists and motorists along such routes.

(2) Class I Bikeway (Bike Path). Generally, bike paths should be used to serve corridors not served by streets and highways or where wide right of way exists, permitting such facilities to be constructed away from the influence of parallel streets. Bike paths should offer opportunities not provided by the road system. They can either provide a recreational opportunity, or in some instances, can serve as direct high-speed commute routes if cross flow by motor vehicles can be minimized. The most common applications are along rivers, ocean fronts, canals, utility right of way, abandoned railroad right of way, within college campuses, or within and between parks. There may also be situations where such facilities can be provided as part of planned developments. Another common application of Class I facilities is to close gaps to bicycle travel caused by construction of freeways or because of the existence of natural barriers (rivers, mountains, etc.).

(3) Class II Bikeway (Bike Lane). Bike lanes are established along streets in corridors where there is significant bicycle demand, and where there are distinct needs that can be served by them. The purpose should be to improve conditions for bicyclists in the corridors. Bike lanes are intended to delineate the right of way assigned to bicyclists and motorists and to provide for more predictable movements by each. But a more important reason for constructing bike lanes is to better accommodate bicyclists through corridors where insufficient room exists for safe bicycling on existing streets. This can be accomplished by reducing the number of lanes, or prohibiting parking on given streets in order to delineate bike lanes. In addition, other things can be done on bike lane streets to improve the situation for bicyclists, that might not be possible on all streets (e.g., improvements to the surface, augmented sweeping programs, special signal facilities, etc.). Generally, stripes alone will not measurably enhance bicycling.

If bicycle travel is to be controlled by delineation, special efforts should be made to assure that high levels of service are provided with these lanes.

In selecting appropriate streets for bike lanes, location criteria discussed in the next section should be considered.

(4) Class III Bikeway (Bike Route). Bike routes are shared facilities which serve either to:

(a) Provide continuity to other bicycle facilities (usually Class II bikeways); or

(b) Designate preferred routes through high demand corridors.

As with bike lanes, designation of bike routes should indicate to bicyclists that there are particular advantages to using these routes as compared with alternative routes. This means that responsible agencies have taken actions to assure that these routes are suitable as shared routes and will be maintained in a manner consistent with the needs of bicyclists. Normally, bike routes are shared with motor vehicles. The use of sidewalks as Class III bikeways is strongly discouraged.

It is emphasized that the designation of bikeways as Class I, II and III should not be construed as a hierarchy of bikeways; that one is better than the other. Each class of bikeway has its appropriate application.

In selecting the proper facility, an overriding concern is to assure that the proposed facility will not encourage or require bicyclists or motorists to operate in a manner that is inconsistent with the rules of the road.

An important consideration in selecting the type of facility is continuity. Alternating segments of Class I and Class II (or Class III) bikeways along a route are generally incompatible, as street crossings by bicyclists are required when the route changes character. Also, wrong-way bicycle travel will occur on the street beyond the ends of bike paths because of the inconvenience of having to cross the street.

Topic 1003 - Design Criteria

1003.1 Class I Bikeways

Class I bikeways (bike paths) are facilities with exclusive right of way, with cross flows by motorists minimized. Section 890.4 of the Streets and Highways Code describes Class I bikeways as serving "the exclusive use of bicycles and pedestrians". However, experience has shown that if significant pedestrian use is anticipated, separate facilities for pedestrians are necessary to minimize conflicts. Dual use by pedestrians and bicycles is undesirable, and the two should be separated wherever possible.

Sidewalk facilities are not considered Class I facilities because they are primarily intended to serve pedestrians, generally cannot meet the design standards for Class I bikeways, and do not minimize motorist cross flows. See Index 1003.3 for discussion relative to sidewalk bikeways.

By State law, motorized bicycles ("mopeds") are prohibited on bike paths unless authorized by ordinance or approval of the agency having jurisdiction over the path. Likewise, all motor vehicles are prohibited from bike paths. These prohibitions can be strengthened by signing.

(1) Widths. **The minimum paved width for a two-way bike path shall be 2.4 m. The minimum paved width for a one-way bike path shall be 1.5 m. A minimum 0.6 m wide graded area shall be provided adjacent to the pavement (see Figure 1003.1A).** A 1.0 m graded area is recommended to provide clearance from poles, trees, walls, fences, guardrails, or other lateral obstructions. A wider graded area can also serve as a jogging path. Where the paved width is wider than the minimum required, the graded area may be reduced accordingly; however, the graded area is a desirable feature regardless of the paved width. Development of a one-way bike path should be undertaken only after careful consideration due to the problems of enforcing one-way operation and the difficulties in maintaining a path of restricted width.

Where heavy bicycle volumes are anticipated and/or significant pedestrian traffic is expected, the paved width of a two-way path should be greater than 2.4 m, preferably 3.6 m or more. Another important factor to consider in determining the appropriate width is that bicyclists will tend to ride side by side on bike paths, necessitating more width for safe use.

Experience has shown that paved paths less than 3.6 m wide sometimes break up along the edge as a result of loads from maintenance vehicles.

Where equestrians are expected, a separate facility should be provided.

(2) Clearance to Obstructions. **A minimum 0.6 m horizontal clearance to obstructions shall be provided adjacent to the pavement (see Figure 1003.1A).** A 1.0 m clearance is recommended. Where the paved width is wider than the minimum required, the clearance may be reduced accordingly; however, an adequate clearance is desirable regardless of the paved width. If a wide path is paved contiguous with a continuous fixed object (e.g., block wall), a 100 mm white edge stripe, 0.3 m from the fixed object, is recommended to minimize the likelihood of a bicyclist hitting it. **The clear width on structures between railings shall be not less than 2.4 m.** It is desirable that the clear width of structures be equal to the minimum clear width of the path (i.e., 3.6 m).

The vertical clearance to obstructions across the clear width of the path shall be a minimum of 2.5 m. Where practical, a vertical clearance of 3 m is desirable.

(3) Striping and Signing. A yellow centerline stripe may be used to separate opposing directions of travel. A centerline stripe is particularly beneficial in the following circumstances:

(a) Where there is heavy use;

(b) On curves with restricted sight distance; and,

Figure 1003.1A

Two-way Bike Path on Separate Right of Way

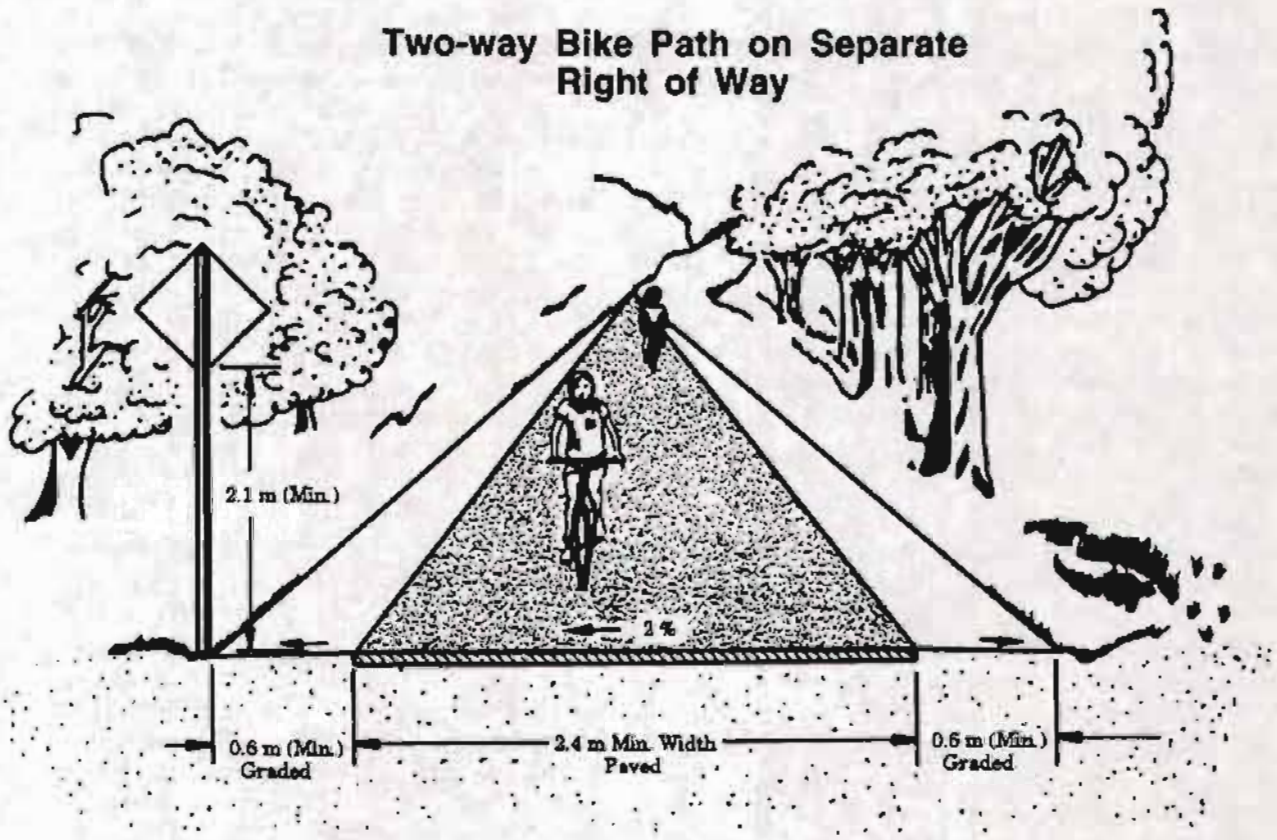
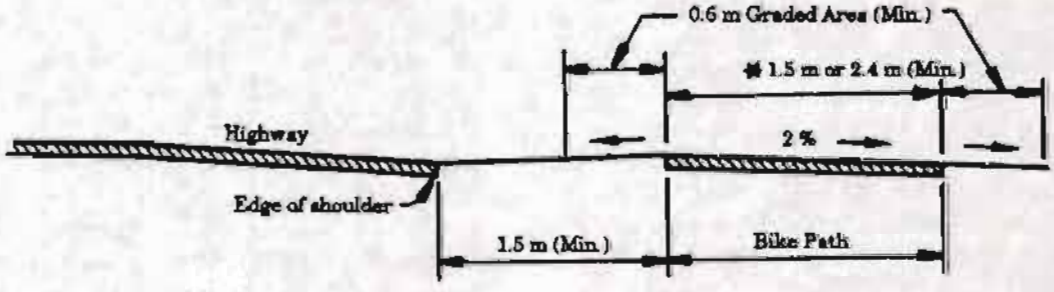


Figure 1003.1B

Typical Cross Section of Bike Path Along Highway



NOTE: See Index 1003.1(5).

* One - Way: 1.5 m Minimum Width
Two - Way: 2.4 m Minimum Width

(c) Where the path is unlighted and nighttime riding is expected. (Refer to Topic 1004 for signing and striping details.)

(4) Intersections with Highways. Intersections are a prime consideration in bike path design. If alternate locations for a bike path are available, the one with the most favorable intersection conditions should be selected.

Where motor vehicle cross traffic and bicycle traffic is heavy, grade separations are desirable to eliminate intersection conflicts. Where grade separations are not feasible, assignment of right of way by traffic signals should be considered. Where traffic is not heavy, stop or yield signs for bicyclists may suffice.

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

When crossing an arterial street, the crossing should either occur at the pedestrian crossing, where motorists can be expected to stop, or at a location completely out of the influence of any intersection to permit adequate opportunity for bicyclists to see turning vehicles. When crossing at midblock locations, right of way should be assigned by devices such as yield signs, stop signs, or traffic signals which can be activated by bicyclists. Even when crossing within or adjacent to the pedestrian crossing, stop or yield signs for bicyclists should be placed to minimize potential for conflict resulting from turning autos. Where bike path stop or yield signs are visible to approaching motor vehicle traffic, they should be shielded to avoid confusion. In some cases, Bike Xing signs may be placed in advance of the crossing to alert motorists. Ramps should be installed in the curbs, to preserve the utility of the bike path. Ramps should be the same width as the bicycle paths. Curb cuts and ramps should provide a smooth transition between the bicycle paths and the roadway.

(5) Separation Between Bike Paths and Highways. A wide separation is recommended between bike paths and adjacent highways (see Figure 1003.1B). **Bike paths closer than 1.5 m from the edge of the shoulder shall include a physical barrier to prevent bicyclists from encroaching onto the highway. Bike paths within the clear recovery zone of freeways shall include a physical barrier separation.** Suitable barriers could include chain link fences or dense shrubs. Low barriers (e.g., dikes, raised traffic bars) next to a highway are not recommended because bicyclists could fall over them and into oncoming automobile traffic. In instances where there is danger of motorists encroaching into the bike path, a positive barrier (e.g., concrete barrier, steel guardrailing) should be provided. See Index 1003.6 for criteria relative to bike paths carried over highway bridges.

Bike paths immediately adjacent to streets and highways are not recommended. They should not be considered a substitute for the street, because many bicyclists will find it less convenient to ride on these types of facilities as compared with the streets, particularly for utility trips.

(6) Bike Paths in the Median of Highways. As a general rule, bike paths in the median of highways are not recommended because they require movements contrary to normal rules of the road. Specific problems with such facilities include:

(a) Bicyclist right turns from the center of roadways are unnatural for bicyclists and confusing to motorists.

(b) Proper bicyclist movements through intersections with signals are unclear.

(c) Left-turning motorists must cross one direction of motor vehicle traffic and two directions of bicycle traffic, which increases conflicts.

(d) Where intersections are infrequent, bicyclists will enter or exit bike paths at midblock.

(e) Where medians are landscaped, visual relationships between bicyclists and motorists at intersections are impaired.

For the above reasons, bike paths in the median of highways should be considered only when the above problems can be avoided. **Bike paths shall not be designed in the medians of freeways or expressways.**

(7) *Design Speed.* The proper design speed for a bike path is dependent on the expected type of use and on the terrain. **The minimum design speed for bike paths shall be 40 km/h except as noted in Table 1003.1.**

Table 1003.1

Bike Path Design Speeds

Type of Facility	Design Speed (km/h)
Bike Paths with Mopeds Prohibited	40
Bike Paths with Mopeds Permitted	50
Bike Paths on Long Downgrades (steeper than 4%, and longer than 150 m)	50

Installation of "speed bumps" or other similar surface obstructions, intended to cause bicyclists to slow down in advance of intersections or other geometric constraints, shall not be used. These devices cannot compensate for improper design.

(8) *Horizontal Alignment and Superelevation.* The minimum radius of curvature negotiable by a bicycle is a function of the superelevation rate of the bicycle path surface, the coefficient of friction between the bicycle tires and the bicycle path surface, and the speed of the bicycle.

For most bicycle path applications the superelevation rate will vary from a minimum of 2 percent (the minimum necessary to encourage adequate drainage) to a maximum of approximately 5 percent (beyond which maneuvering difficulties by slow bicyclists and adult tricyclists might be expected). A straight 2% cross slope is recommended on tangent sections. The minimum superelevation rate of 2% will be adequate for most conditions and will simplify construction. Superelevation rates steeper than 5 percent should be avoided on bike paths expected to have adult tricycle traffic.

The coefficient of friction depends upon speed; surface type, roughness, and condition; tire type and condition; and whether the surface is wet or dry. Friction factors used for design should be selected based upon the point at which centrifugal force causes the bicyclist to recognize a feeling of discomfort and instinctively act to avoid higher speed. Extrapolating from values used in highway design, design friction factors for paved bicycle paths can be assumed to vary from 0.31 at 20 km/h to 0.21 at 50 km/h. Although there is no data available for unpaved surfaces, it is suggested that friction factors be reduced by 50 percent to allow a sufficient margin of safety.

The minimum radius of curvature can be selected from Figure 1003.1C. When curve radii smaller than those shown in Figure 1003.1C must be used on bicycle paths because of right of way, topographical or other considerations, standard curve warning signs and supplemental pavement markings should be installed. The negative effects of nonstandard curves can also be partially offset by widening the pavement through the curves.

(9) *Stopping Sight Distance.* To provide bicyclists with an opportunity to see and react to the unexpected, a bicycle path should be designed with adequate stopping sight distances. The distance required to bring a bicycle to a full controlled stop is a function of the bicyclist's perception and brake reaction time, the initial speed of the bicycle, the coefficient of friction between the tires and the pavement, and the braking ability of the bicycle.

Figure 1003.1D indicates the minimum stopping sight distances for various design speeds and grades. For two-way bike paths, the descending direction, that is, where "G" is negative, will control the design.

(10)Length of Crest Vertical Curves. Figure 1003.1E indicates the minimum lengths of crest vertical curves for varying design speeds.

(11)Lateral Clearance on Horizontal Curves. Figure 1003.1F indicates the minimum clearances to line of sight obstructions for horizontal curves. The required lateral clearance is obtained by entering Figure 1003.1F with the stopping sight distance from Figure 1003.1D and the proposed horizontal curve radius.

Bicyclists frequently ride abreast of each other on bicycle paths, and on narrow bicycle paths, bicyclists have a tendency to ride near the middle of the path. For these reasons, and because of the serious consequences of a head on bicycle accident, lateral clearances on horizontal curves should be calculated based on the sum of the stopping sight distances for bicyclists traveling in opposite directions around the curve. Where this is not possible or feasible, consideration should be given to widening the path through the curve, installing a yellow center stripe, installing a curve ahead warning sign, or some combination of these alternatives.

(12)Grades. Bike paths generally attract less skilled bicyclists, so it is important to avoid steep grades in their design. Bicyclists not physically conditioned will be unable to negotiate long, steep uphill grades. Since novice bicyclists often ride poorly maintained bicycles, long downgrades can cause problems. For these reasons, bike paths with long, steep grades will generally receive very little use. The maximum grade rate recommended for bike paths is 5%. It is desirable that sustained grades be limited to 2% if a wide range of riders is to be accommodated. Steeper grades can be tolerated for short segments (e.g., up to about 150 m). Where steeper grades are necessitated, the design speed should be increased and additional width should be provided for maneuverability.

(13)Structural Section. The structural section of a bike path should be designed in the same manner as a highway, with consideration given to the quality of the basement soil and the anticipated loads the bikeway will experience. It is important to construct and maintain a smooth riding surface with skid resistant qualities. Principal loads will normally be from maintenance and emergency vehicles. Expansive soil should be given special consideration and will probably require a special structural section. A minimum pavement thickness of 50 mm of asphalt concrete is recommended. Type "A" or "B" asphalt concrete (as described in Department of Transportation Standard Specifications), with 12.5 mm maximum aggregate and medium grading is recommended. Consideration should be given to increasing the asphalt content to provide increased pavement life. Consideration should also be given to sterilization of basement soil to preclude possible weed growth through the pavement.

At unpaved highway or driveway crossings of bicycle paths, the highway or driveway should be paved a minimum of 3 m on each side of the crossing to reduce the amount of gravel being scattered along the path by motor vehicles. The pavement structure at the crossing should be adequate to sustain the expected loading at that location.

(14)Drainage. For proper drainage, the surface of a bike path should have a cross slope of 2%. Sloping in one direction usually simplifies longitudinal drainage design and surface construction, and accordingly is the preferred practice. Ordinarily, surface drainage from the path will be adequately dissipated as it flows down the gently sloping shoulder. However, when a bike path is constructed on the side of a hill, a drainage ditch of suitable dimensions may be necessary on the uphill side to intercept the hillside drainage. Where necessary, catch basins with drains should be provided to carry intercepted water across the path. Such ditches should be designed in such a way that no undue obstacle is presented to bicyclists.

Culverts or bridges are necessary where a bike path crosses a drainage channel.

Figure 1003.1C

Curve Radii & Superelevations

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

where,

R = Minimum radius of curvature (m),

V = Design Speed (km/h),

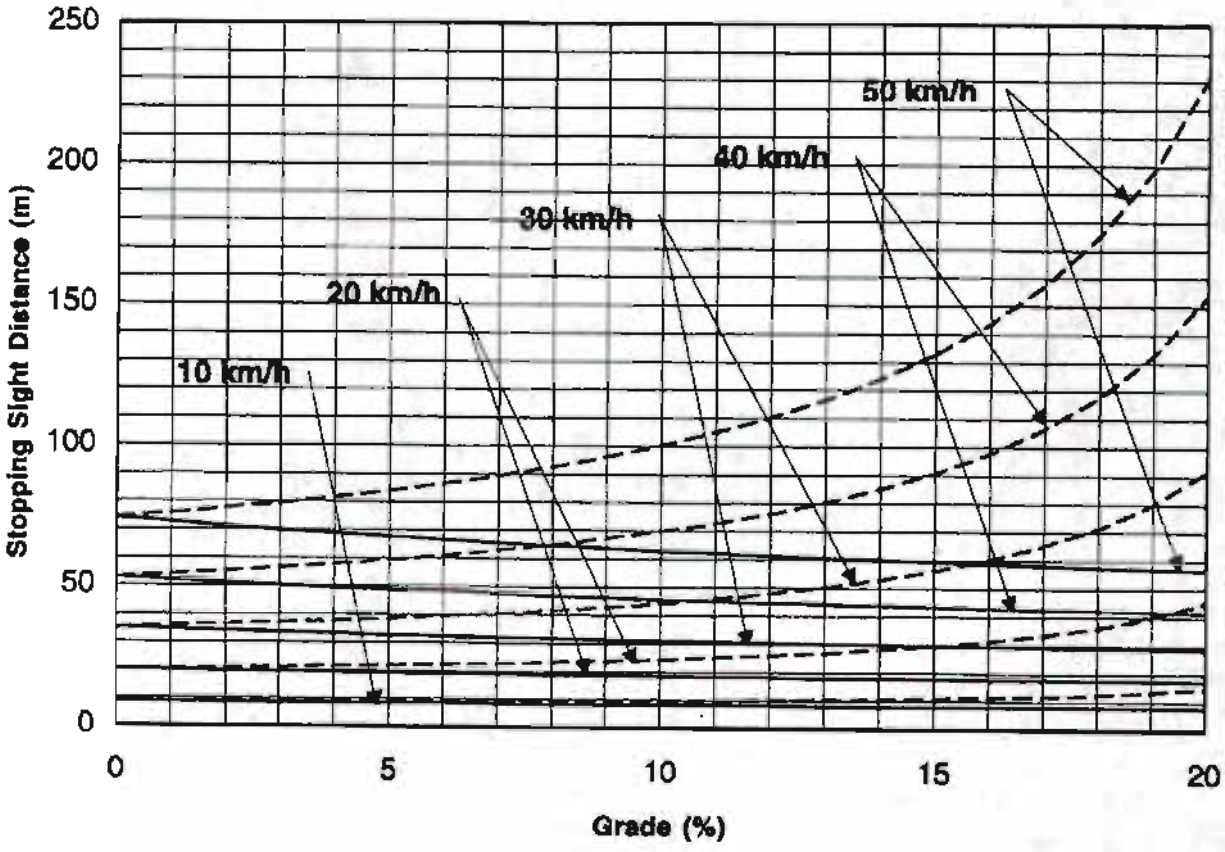
e = Rate of bikeway superelevation, percent

f = Coefficient of friction

Design Speed-V (km/h)	Friction Factor-f	Superelevation-e (%)	Minimum Radius-R (m)
20	0.31	2	10
30	0.28	2	24
40	0.25	2	47
50	0.21	2	86
20	0.31	3	9
30	0.28	3	23
40	0.25	3	45
50	0.21	3	82
20	0.31	4	9
30	0.28	4	22
40	0.25	4	43
50	0.21	4	79
20	0.31	5	9
30	0.28	5	21
40	0.25	5	42
50	0.21	5	76

Figure 1003.1D

Stopping Sight Distance



$$S = \frac{V^2}{254\,(f \pm G)} + \frac{V}{1.4}$$

Descend ------
Ascend ——

Where : S = stopping sight, m
V = velocity, km/h
f = coefficient of friction (use 0.25)
G = grade, m/m (rise/run)

Figure 1003.1E

Stopping Sight Distances for Crest Vertical Curves

$L = 2S - \frac{450}{A}$ when $S > L$

$L = \frac{AS^2}{450}$ when $S < L$

Height of cyclist eye - 1400 mm
Height of object - 100 mm

Double line represents S=L
L = Min. length of vertical curve - meters
A = Algebraic grade difference-%
S = Stopping sight distance - meters
V = Design speed km/h (Refer to Figure 1003.1D to determine "V", after "S" is determined.)

GIVEN "A" AND "L"; FIND "S"

A (%)	L=50 m S (m)	L=100 m S (m)	L=150 m S (m)	L=200 m S (m)	L=250 m S (m)	L=300 m S (m)
4.5	75					
5	70	95				
5.5	66	90				
6	63	87				
6.5	60	83				
7	57	80	98			
7.5	55	77	95			
8	53	75	92			
8.5	51	73	89	103		
9	50	71	87	100		
9.5	49	69	84	97		
10	47	67	82	95		
10.5	46	65	80	93		
11	45	64	78	90		
11.5	44	63	77	88	99	
12	43	61	75	87	97	
12.5	42	60	73	85	95	
13	42	59	72	83	93	
13.5	41	58	71	82	91	
14	40	57	69	80	90	98
14.5	39	56	68	79	88	96
15	39	55	67	77	87	95

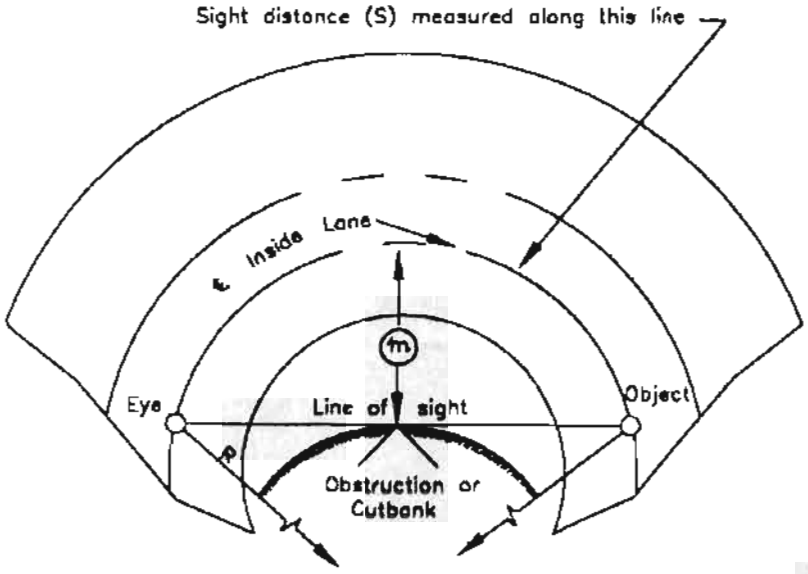
Figure 1003.1E

Stopping Sight Distances for Crest Vertical Curves (continued)

GIVEN "A" AND "S"; FIND "L"

A (%)	S=10 m L (m)	S=15 m L (m)	S=20 m L (m)	S=25 m L (m)	S=30 m L (m)	S=35 m L (m)	S=40 m L (m)	S=45 m L (m)	S=50 m L (m)
5									10.0
6							5.0	15.0	25.0
7						5.7	15.7	25.7	35.7
8					3.8	13.8	23.8	33.8	43.8
9					10.0	20.0	30.0	40.0	50.0
10				5.0	15.0	25.0	35.0	45.0	55.6
11				9.1	19.1	29.1	39.1	49.5	61.1
12			2.5	12.5	22.5	32.5	42.7	54.0	66.7
13			5.4	15.4	25.4	35.4	46.2	58.5	72.2
14			7.9	17.9	27.9	38.1	49.8	63.0	77.8
15			10.0	20.0	30.0	40.8	53.3	67.5	83.3
16		1.9	11.9	21.9	32.0	43.6	56.9	72.0	88.9
17		3.5	13.5	23.5	34.0	46.3	60.4	76.5	94.4
18		5.0	15.0	25.0	36.0	49.0	64.0	81.0	100.0
19		6.3	16.3	26.4	38.0	51.7	67.6	85.5	105.6
20		7.5	17.5	27.8	40.0	54.4	71.1	90.0	111.1
21		8.6	18.6	29.2	42.0	57.2	74.7	94.5	116.7
22		9.5	19.6	30.6	44.0	59.9	78.2	99.0	122.2
23		10.4	20.4	31.9	46.0	62.6	81.8	103.5	127.8
24		11.3	21.3	33.3	48.0	65.3	85.3	108.0	133.3
25		12.0	22.2	34.7	50.0	68.1	88.9	112.5	138.9
26		12.7	23.1	36.1	52.0	70.8	92.4	117.0	144.4
27		13.3	24.0	37.5	54.0	73.5	96.0	121.5	150.0
28	4	13.9	24.9	38.9	56.0	76.2	99.6	126.0	155.6
29	4	14.5	25.8	40.3	58.0	78.9	103.1	130.5	161.1
30	5	15.0	26.7	41.7	60.0	81.7	106.7	135.0	166.7

Figure 1003.1F
Lateral Clearances on Horizontal Curves



S = Sight distance in meters.
R = Radius of ℄ of lane in meters.
m = Distance from ℄ of lane in meters.
V = Design speed for S in km/h.
(Refer to Figure 1003.1D to determine "V", after "S" is determined.)

Angle is expressed in degrees

$$m = R\left[1-\cos\left(\frac{28.65S}{R}\right)\right]$$

$$S = \frac{R}{28.65}\left[\cos^{-1}\left(\frac{R-m}{R}\right)\right]$$

Formula applies only when S is equal to or less than length of curve.

Line of sight is 600 mm above ℄ inside lane at point of obstruction.

GIVEN "R" AND "S"; FIND "m"

R (m)	S=10 m *m* meters	S=20 m *m* meters	S=30 m *m* meters	S=40 m *m* meters	S=50 *m* meters	S=60 m *m* meters	S=70 m *m* meters	S=80 m *m* meters	S=90 m *m* meters	S=100 m *m* meters	S=110 m *m* meters
25	0.50	1.97	4.37	7.58	11.49	15.94	20.75	25.73	30.68	35.41	39.72
50	0.25	1.00	2.23	3.95	6.12	8.73	11.76	15.17	18.92	22.99	27.32
75	0.17	0.67	1.50	2.65	4.13	5.92	8.02	10.42	13.10	16.06	19.28
100	0.12	0.50	1.12	1.99	3.11	4.47	6.06	7.90	9.96	12.24	14.75
125	0.10	0.40	0.90	1.60	2.49	3.58	4.87	6.35	8.01	9.87	11.91
150	0.08	0.33	0.75	1.33	2.08	2.99	4.07	5.30	6.70	8.26	9.97
175	0.07	0.29	0.64	1.14	1.78	2.57	3.49	4.55	5.75	7.10	8.57
200	0.06	0.25	0.56	1.00	1.56	2.25	3.06	3.99	5.04	6.22	7.52
225	0.06	0.22	0.50	0.89	1.39	2.00	2.72	3.55	4.49	5.53	6.69
250	0.05	0.20	0.45	0.80	1.25	1.80	2.45	3.19	4.04	4.98	6.03
275	0.05	0.18	0.41	0.73	1.14	1.63	2.22	2.90	3.67	4.53	5.48
300	0.04	0.17	0.37	0.67	1.04	1.50	2.04	2.66	3.37	4.16	5.03
350	0.04	0.14	0.32	0.57	0.89	1.29	1.75	2.28	2.89	3.57	4.31
400	0.03	0.13	0.28	0.50	0.78	1.12	1.53	2.00	2.53	3.12	3.78
500	0.03	0.10	0.23	0.40	0.62	0.90	1.22	1.60	2.02	2.50	3.02
600	0.02	0.08	0.19	0.33	0.52	0.75	1.02	1.33	1.69	2.08	2.52
700	0.02	0.07	0.16	0.29	0.45	0.64	0.87	1.14	1.45	1.79	2.16
800	0.02	0.06	0.14	0.25	0.39	0.56	0.77	1.00	1.27	1.56	1.89
900	0.01	0.06	0.13	0.22	0.35	0.50	0.68	0.89	1.12	1.39	1.68
1000	0.01	0.05	0.11	0.20	0.31	0.45	0.61	0.80	1.01	1.25	1.51

Figure 1003.1F

Lateral Clearances on Horizontal Curves (continued)

GIVEN "R" AND "m"; FIND "S"

R (m)	m = 1 meter	m = 2 meters	m = 3 meters	m = 4 meters	m = 5 meters	m = 6 meters	m = 7 meters	m = 8 meters	m = 9 meters	m = 10 meters	m = 11 meters
	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)	S (m)
25	14.19	20.13	24.74	28.67	32.17	35.37	38.35	41.15	43.81	46.36	48.82
50	20.03	28.38	34.81	40.27	45.10	49.49	53.55	57.35	60.93	64.35	67.61
75	24.52	34.72	42.57	49.21	55.08	60.40	65.32	69.91	74.23	78.34	82.26
100	28.31	40.06	49.11	56.75	63.51	69.63	75.27	80.54	85.50	90.20	94.68
125	31.64	44.78	54.88	63.41	70.94	77.77	84.06	89.92	95.44	100.67	105.66
150	34.66	49.04	60.10	69.43	77.67	85.13	92.00	98.41	104.44	110.15	115.60
175	37.43	52.96	64.90	74.97	83.86	91.91	99.32	106.23	112.73	118.88	124.75
200	40.01	56.61	69.36	80.13	89.62	98.22	106.13	113.51	120.45	127.01	133.27
225	42.44	60.04	73.56	84.97	95.04	104.15	112.53	120.35	127.70	134.66	141.28
250	44.73	63.28	77.53	89.56	100.16	109.76	118.59	126.82	134.56	141.89	148.86
275	46.91	66.37	81.31	93.92	105.03	115.09	124.35	132.98	141.09	148.77	156.08
300	49.00	69.32	84.92	98.08	109.69	120.19	129.86	138.86	147.33	155.34	162.97
350	52.92	74.86	91.71	105.92	118.45	129.79	140.22	149.94	159.08	167.72	175.95
400	56.58	80.03	98.03	113.22	126.61	138.73	149.87	160.26	170.01	179.25	188.04
500	63.25	89.47	109.59	126.57	141.53	155.06	167.52	179.11	190.01	200.32	210.13
600	69.29	98.00	120.04	138.63	155.02	169.83	183.47	196.16	208.09	219.38	230.12
700	74.84	105.85	129.65	149.73	167.42	183.42	198.14	211.85	224.72	236.91	248.50
800	80.00	113.15	138.60	160.05	178.97	196.07	211.80	226.45	240.21	253.23	265.62
900	84.85	120.01	147.00	169.76	189.81	207.95	224.63	240.16	254.75	268.56	281.69
1000	89.44	126.50	154.95	178.93	200.07	219.18	236.76	253.13	268.51	283.06	296.90

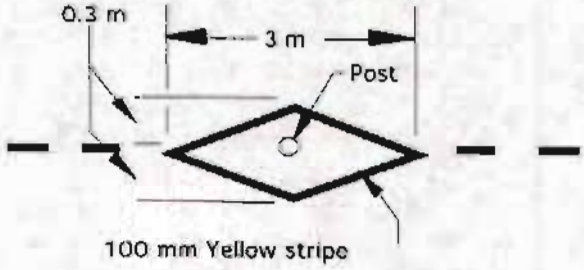
(15)Barrier Posts. It may be necessary to install barrier posts at entrances to bike paths to prevent motor vehicles from entering. When locating such installations, care should be taken to assure that barriers are well marked and visible to bicyclists, day or night (i.e., install reflectors or reflectorized tape).

Striping an envelope around the barriers is recommended (see Figure 1003.1G). If sight distance is limited, special advance warning signs or painted pavement warnings should be provided. Where more than one post is necessary, a 1.5 m spacing should be used to permit passage of bicycle-towed trailers, adult tricycles, and to assure adequate room for safe bicycle passage without dismounting. Barrier post installations should be designed so they are removable to permit entrance by emergency and service vehicles.

Generally, barrier configurations that preclude entry by motorcycles present safety and convenience problems for bicyclists. Such devices should be used only where extreme problems are encountered.

Figure 1003.1G

Barrier Post Striping



(16) Lighting. Fixed-source lighting reduces conflicts along paths and at intersections. In addition, lighting allows the bicyclist to see the bicycle path direction, surface conditions, and obstacles. Lighting for bicycle paths is important and should be considered where riding at night is expected, such as bicycle paths serving college students or commuters, and at highway intersections. Lighting should also be considered through underpasses or tunnels, and when nighttime security could be a problem.

Depending on the location, average maintained horizontal illumination levels of 5 lux to 22 lux should be considered. Where special security problems exist, higher illumination levels may be considered. Light standards (poles) should meet the recommended horizontal and vertical clearances. Luminaires and standards should be at a scale appropriate for a pedestrian or bicycle path.

1003.2 Class II Bikeways

Class II bikeways (bike lanes) for preferential use by bicycles are established within the paved area of highways. Bike lane stripes are intended to promote an orderly flow of traffic, by establishing specific lines of demarcation between areas reserved for bicycles and lanes to be occupied by motor vehicles. This effect is supported by bike lane signs and pavement markings. Bike lane stripes can increase bicyclists' confidence that motorists will not stray into their path of travel if they remain within the bike lane. Likewise, with more certainty as to where bicyclists will be, passing motorists are less apt to swerve toward opposing traffic in making certain they will not hit bicyclists.

Class II bike lanes shall be one-way facilities. Two-way bike lanes (or bike paths that are contiguous to the roadway) are not permitted, as such facilities have proved unsatisfactory and promote riding against the flow of motor vehicle traffic.

(1) Widths. Typical Class II bikeway configurations are illustrated in Figure 1003.2A and are described below:

(a) Figure 1003.2A-(1) depicts bike lanes on an urban type curbed street where parking stalls (or continuous parking stripes) are marked. Bike lanes are located between the parking area and the traffic lanes. **As indicated, 1.5 m shall be the minimum width of bike lane where parking stalls are marked.** If parking volume is substantial or turnover high, an additional 0.3 m to 0.6 m of width is desirable.

Bike lanes shall not be placed between the parking area and the curb. Such facilities increase the conflict between bicyclists and opening car doors and reduce visibility at intersections. Also, they prevent bicyclists from leaving the bike lane to turn left and cannot be effectively maintained.

(b) Figure 1003.2A-(2) depicts bike lanes on an urban-type curbed street, where parking is permitted, but without parking stripe or stall marking. Bike lanes are established in conjunction with the parking areas. **As indicated, 3.3 m or 3.6 m (depending on the type of curb) shall be the minimum width of the bike lane where parking is permitted.** This type of lane is satisfacory where parking is not extensive and where turnover of parked cars is infrequent. However, if parking is substantial, turnover of parked cars is high, truck traffic is substantial, or if vehicle speeds exceed 55 km/h, additional width is recommended.

(c) Figure 1003.2A-(3) depicts bike lanes along the outer portions of an urban type curbed street, where parking is prohibited. This is generally the most desirable configuration for bike lanes, as it eliminates potential conflicts resulting from auto parking (e.g., opening car doors). **As indicated, if no gutter exists, the minimum bike lane width shall be 1.2 m. With a normal 600 mm gutter, the minimum bike lane width shall be 1.5 m.** The intent is to provide a minimum 1.2 m wide bike lane, but with at least 0.9 m between the traffic lane and the longitudinal joint at the concrete gutter, since the gutter reduces the effective width of the bike lane for two reasons. First, the longitudinal joint may not always be smooth, and may be difficult to ride along. Secondly, the gutter does not provide a suitable surface for bicycle travel. Where gutters are wide (say, 1.2 m), an additional 0.9 m must be provided because bicyclists should not be expected to ride in the gutter. Wherever possible, the width of bike lanes should be increased to 1.8 m to 2.4 m to provide forgreater safety. 2.4 m bike lanes can also serve as emergency parking areas for disabled vehicles.

Striping bike lanes next to curbs where parking is prohibited only during certain hours shall be done only in conjunction with special signing to designate the hours bike lanes are to be effective. Since the Vehicle Code requires bicyclists to ride in bike lanes where provided (except under certain conditions), proper signing is necessary to inform bicyclists that they are required to ride in bike lanes only during the course of the parking prohibition. This type of bike lane should be considered only if the vast majority of bicycle travel would occur during the hours of the parking prohibition, and only if there is a firm commitment to enforce the parking prohibition. Because of the obvious complications, this type of bike lane is not encouraged for general application.

Figure 1003.2A(4) depicts bike lanes on a highway without curbs and gutters. This location is in an undeveloped area where infrequent parking is handled off the pavement. This can be accomplished by supplementing the bike lane signing with R25 (park off pavement) signs, or R26 (no parking) signs. **Minimum widths shall be as shown.** Additional width is desirable, particularly where motor vehicle speeds exceed 55 km/h.

The typical traffic lane width next to a bike lane is 3.6 m. Lane widths narrower than 3.6 m must receive approval as discussed in Index 82.2. There are situations where it may be necessary to reduce the width of the traffic lanes in order to stripe bike lanes. In determining the appropriateness of narrower traffic lanes, consideration should be given to factors such as motor vehicle speeds, truck volumes, alignment, and sight distance. Where favorable conditions exist, traffic lanes of 3.3 m may be feasible.

Bike lanes are not advisable on long, steep downgrades, where bicycle speeds greater than 50 km/h are expected. As grades increase, downhill bicycle speeds will increase, which increases the problem of riding near the edge of the roadway. In such situations, bicycle speeds can approach those of motor vehicles, and experienced bicyclists will generally move into the motor vehicle lanes to increase sight distance and maneuverability. If bike lanes are to be striped, additional width should be provided to accommodate higher bicycle speeds.

If the bike lanes are to be located on one-way streets, they should be placed on the right side of the street. Bike lanes on the left side would cause bicyclists and motorists to undertake crossing maneuvers in making left turns onto a two-way street.

(2) *Striping and Signing.* Details for striping and signing of bike lanes are included under Topic 1004.

Raised barriers (e.g., raised traffic bars and asphalt concrete dikes) or raised pavement markers shall not be used to delineate bike lanes. Raised barriers prevent motorists from merging into bike lanes before making right turns, as required by the Vehicle Code, and restrict the movement of bicyclists desiring to enter or exit bike lanes. They also impede routine maintenance. Raised pavement markers increase the difficulty for bicyclists when entering or exiting bike lanes, and discourage motorists from merging into bike lanes before making right turns.

Bike lane stripes should be placed a constant distance from the outside motor vehicle lane. Bike lanes with parking permitted (3.3 m to 3.9 m between the bike lane line and the curb) should not be directed toward the curb at intersections or localized areas where parking is prohibited. Such a practice prevents bicyclists from following a straight course. Where transitions from one type of bike lane to another are necessary, smooth tapers should be provided.

(3) *Intersection Design.* Most auto/bicycle accidents occur at intersections. For this reason, bikeway design at intersections should be accomplished in a manner that will minimize confusion by motorists and bicyclists, and will permit both to operate in accordance with the normal rules of the road.

Figure 1003.2B illustrates a typical intersection of multilane streets, with bike lanes on all approaches. Some common movements of motor vehicles and bicycles are shown. A prevalent type of accident involves straight-through bicycle traffic and right-turning motorists. Left-turning bicyclists also have problems, as the bike lane is on the right side of the street, and bicyclists have to cross the path of cars traveling in both directions. Some bicyclists are proficient enough to merge across one or more lanes of traffic, to use the inside lane or left-turn lane provided for motor vehicles. However, there are many who do not feel comfortable making this maneuver. They have the option of making a two-legged left turn by riding along a course similar to that followed by pedestrians, as shown in the diagram. Young children will often prefer to dismount and change directions by walking their bike in the crosswalk.

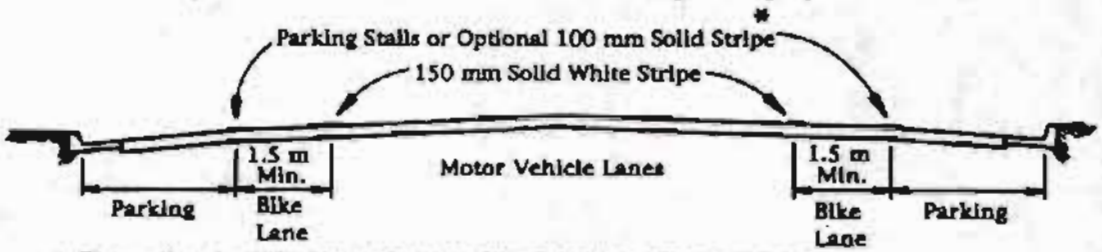
At intersections where there is a bike lane and traffic-actuated signal, installation of bicycle-sensitive detectors within the bike lane is desirable. Push button detectors are not as satisfactory as those located in the pavement because the cyclist must stop to actuate the push button. It is also desirable that detectors in left-turn lanes be sensitive enough to detect bicycles (see Chapter 9 of the Traffic Manual and Standard Plans for bicycle-sensitive detector designs).

At intersections (without bike lanes) with significant bicycle use and a traffic-actuated signal, it is desirable to install detectors that are sensitive enough to detect bicycles.

Figure 1003.2C illustrates recommended striping patterns for bike lanes crossing a motorist right-turn-only lane. When confronted with such intersections, bicyclists will have to merge with right-turning motorists. Since bicyclists are typically

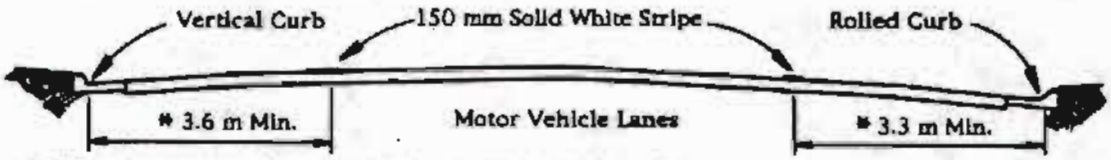
Figure 1003.2A

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



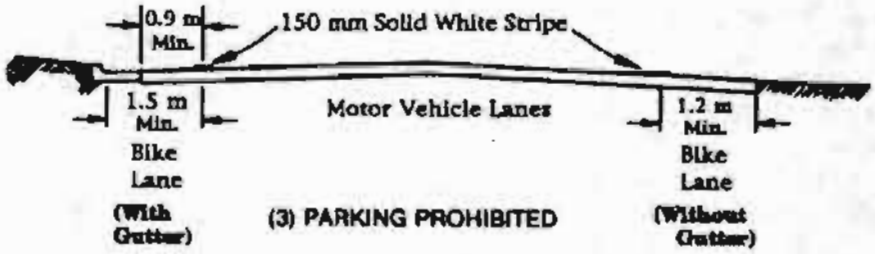
* The optional solid white stripe may be advisable where stalls are unnecessary (because parking is light) but there is concern that motorists may misconstrue the bike lane to be a traffic lane.

(1) STRIPED PARKING

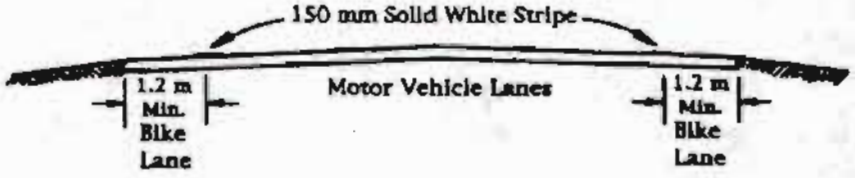


* 3.9 m is recommended where there is substantial parking or turnover of parked cars is high (e.g. commercial areas)

(2) PARKING PERMITTED WITHOUT PARKING STRIPE OR STALL



(3) PARKING PROHIBITED



(4) TYPICAL ROADWAY IN OUTLYING AREAS PARKING RESTRICTED

Figure 1003.2B

Typical Bicycle/Auto Movements at Intersections of Multilane Streets

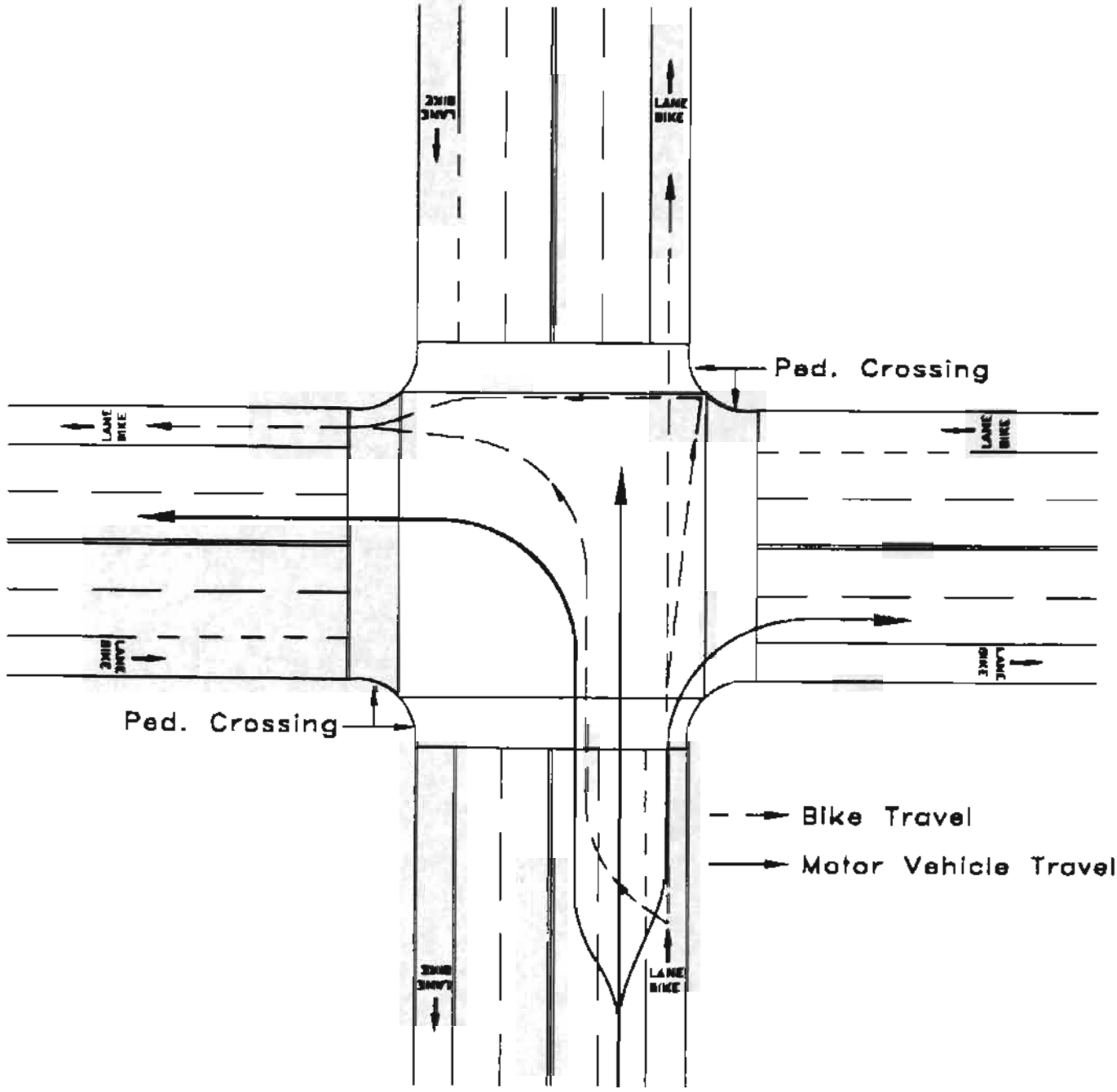
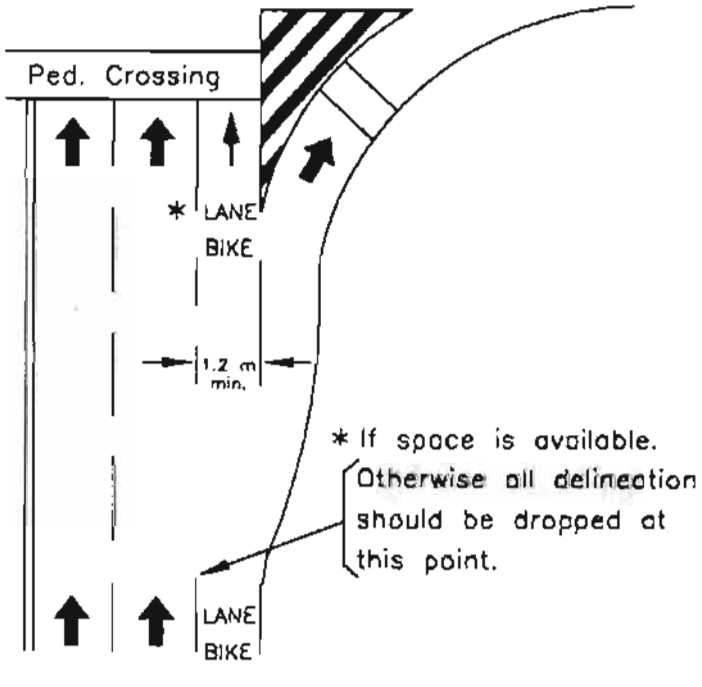
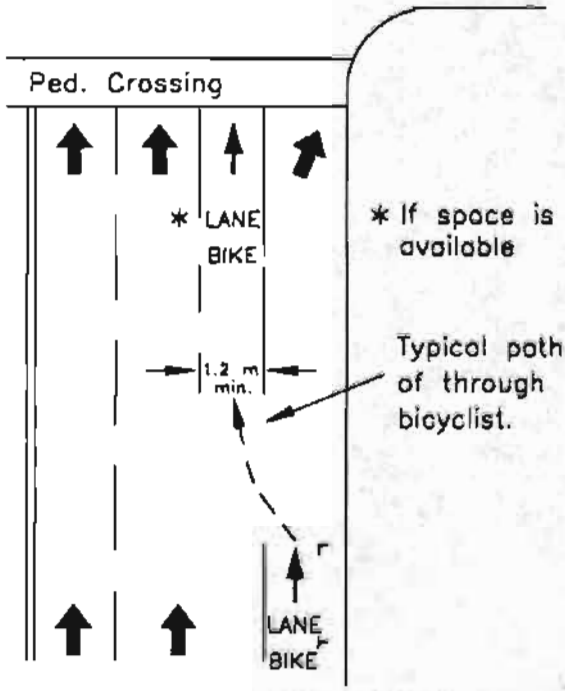


Figure 1003.2C

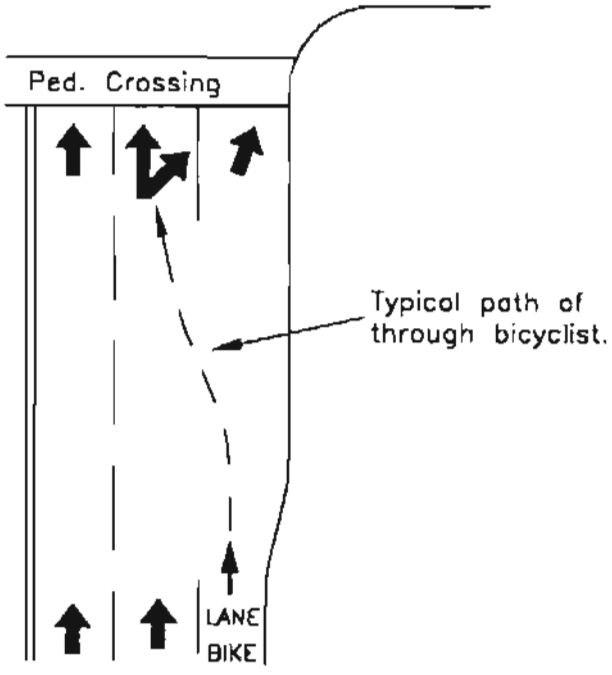
Bike Lanes Approaching Motorist Right-turn-only Lanes



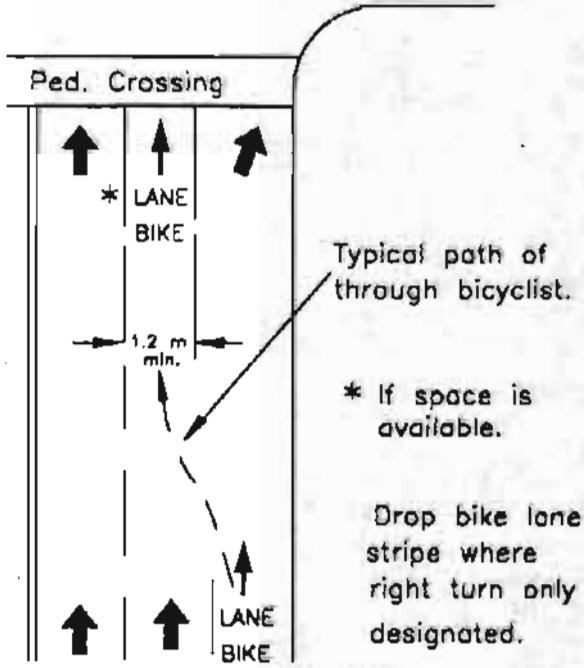
RIGHT–TURN–ONLY LANE



PARKING AREA BECOMES RIGHT–TURN–ONLY LANE



OPTIONAL DOUBLE RIGHT–TURN–ONLY LANE



RIGHT LANE BECOMES RIGHT–TURN–ONLY LANE

traveling at speeds less than motorists,they should signal and merge where there is sufficient gap in right-turning traffic, rather than at any predetermined location. For this reason, it is recommended that all delineation be dropped at the approach of the right-turn lane (or off-ramp). A pair of parallel lines (delineating a bike lane crossing) to channel the bike merge is not recommended, as bicyclists will be encouraged to cross at a predetermined location, rather than when there is a safe gap in right-turning traffic. Also, some bicyclists are apt to assume they have the right of way, and may not check for right-turning motor vehicle traffic.

A dashed line across the right-turn-only lane is not recommended on extremely long lanes, or where there are double right-turn-only lanes. For these types of intersections, all striping should be dropped to permit judgment by the bicyclists to prevail. A Bike Xing sign may be used to warn motorists of the potential for bicyclists crossing their path.

1003.3 Class III Bikeways

Class III bikeways (bike routes) are intended to provide continuity to the bikeway system. Bike routes are established along through routes not served by Class I or II bikeways, or to connect discontinuous segments of bikeway (normally bike lanes). Class III facilities are shared facilities, either with motor vehicles on the street, or with pedestrians on sidewalks, and in either case bicycle usage is secondary. Class III facilities are established by placing Bike Route signs along roadways.

Minimum widths for Class III bikeways are not presented, as the acceptable width is dependent on many factors, including the volume and character of vehicular traffic on the road, typical speeds, vertical and horizontal alignment, sight distance, and parking conditions.

Since bicyclists are permitted on all highways (except prohibited freeways), the decision to sign the route should be based on the advisability of encouraging bicycle travel on the route and other factors listed below.

(1) On-street Bike Route Criteria. To be of benefit to bicyclists, bike routes should offer a higher degree of service than alternative streets. Routes should be signed only if some of the following apply:

(a) They provide for through and direct travel in bicycle-demand corridors.

(b) Connect discontinuous segments of bike lanes.

(c) An effort has been made to adjust traffic control devices (stop signs, signals) to give greater priority to bicyclists, as compared with alternative streets. This could include placement of bicycle-sensitive detectors on the right-hand portion of the road, where bicyclists are expected to ride.

(d) Street parking has been removed or restricted in areas of critical width to provide improved safety.

(e) Surface imperfections or irregularities have been corrected (e.g., utility covers adjusted to grade, potholes filled, etc.).

(f) Maintenance of the route will be at a higher standard than that of other comparable streets (e.g., more frequent street sweeping).

(2) Sidewalk Bikeway Criteria. In general, the designated use of sidewalks (as a Class III bikeway) for bicycle travel is unsatisfactory.

It is important to recognize that the development of extremely wide sidewalks does not necessarily add to the safety of sidewalk bicycle travel, as wide sidewalks will encourage higher speed bicycle use and can increase potential for conflicts with motor vehicles at intersections, as well as with pedestrians and fixed objects.

Sidewalk bikeways should be considered only under special circumstances, such as:

(a) To provide bikeway continuity along high speed or heavily traveled roadways having inadequate space for bicyclists, and uninterrupted by driveways and intersections for long distances.

(b) On long, narrow bridges. In such cases, ramps should be installed at the sidewalk approaches. If approach bikeways are two-way, sidewalk facilities should also be two-way.

Whenever sidewalk bikeways are established, a special effort should be made to remove unnecessary obstacles. Whenever bicyclists are directed from bike lanes to sidewalks, curb cuts should be flush with the street to assure that bicyclists are not subjected to problems associated with crossing a vertical lip at a flat angle. Also curb cuts at each intersection are necessary, as well as bikeway yield or stop signs at uncontrolled intersections. Curb cuts should be wide enough to accommodate adult tricycles and two-wheel bicycle trailers.

In residential areas, sidewalk riding by young children too inexperienced to ride in the street is common. With lower bicycle speeds and lower auto speeds, potential conflicts are somewhat lessened, but still exist. Nevertheless, this type of sidewalk bicycle use is accepted. But it is inappropriate to sign these facilities as bikeways. Bicyclists should not be encouraged (through signing) to ride facilities that are not designed to accommodate bicycle travel.

(3) *Destination Signing of Bike Routes.* For Bike Route signs to be more functional, supplemental plates may be placed beneath them when located along routes leading to high demand destinations (e.g., "To Downtown"; "To State College"; etc.-- see Figure 1004.4 for typical signing).

There are instances where it is necessary to sign a route to direct bicyclists to a logical destination, but where the route does not offer any of the above listed bike route features. In such cases, the route should not be signed as a bike route; however, destination signing may be advisable. A typical application of destination signing would be where bicyclists are directed off a highway to bypass a section of freeway. Special signs would be placed to guide bicyclists to the next logical destination. The intent is to direct bicyclists in the same way as motorists would be directed if a highway detour was necessitated.

1003.4 Bicycles on Freeways

In some instances, bicyclists are permitted on freeways. Seldom would a freeway be signed or striped as a bikeway, but it can be opened for use if it meets certain criteria. Essentially, the criteria involve assessing the safety and convenience of the freeway as compared with available alternate routes. However, a freeway should not be opened to bicycle use if it is determined to be incompatible. The Headquarters Traffic Reviewer and the OPPD Coordinator must approve any proposals to open freeways to bicyclists.

If a suitable alternate route exists, it would normally be unnecessary to open the freeway. However, if the alternate route is unsuitable for bicycle travel the freeway may be a better alternative for bicyclists. In determining the suitability of an alternate route, safety should be the paramount consideration. The following factors should be considered:

- Number of intersections
- Shoulder widths
- Traffic volumes
- Vehicle speeds
- Bus, truck and recreational vehicle volumes
- Grades
- Travel time

When a suitable alternate route does not exist, a freeway shoulder may be considered for bicycle travel. Normally, freeways in urban areas will have characteristics that make it unfeasible to permit bicycle use. In determining if the freeway shoulder is suitable for bicycle travel, the following factors should be considered;

- Shoulder widths
- Bicycle hazards on shoulders (drainage grates, expansion joints, etc.)
- Number and location of entrance/exit ramps
- Traffic volumes on entrance/exit ramps

When bicyclists are permitted on segments of freeway, it will be necessary to modify and supplement freeway regulatory signs, particularly those at freeway ramp entrances and exits (see Chapter 4 of the Traffic Manual).

Where no reasonable alternate route exists within a freeway corridor, the Department should coordinate with local agencies to develop or improve existing routes or provide parallel bikeways within or adjacent to the freeway right of way.

The long term goal is to provide a safe and convenient non-freeway route for bicycle travel.

1003.5 Multipurpose Trails

In some instances, it may be appropriate for agencies to develop multipurpose trails - for hikers, joggers, equestrians, bicyclists, etc. Many of these trails will not be paved and will not meet the standards for Class I bikeways. As such, these facilities should not be signed as bikeways. Rather, they should be designated as multipurpose trails (or similar designation), along with regulatory signing to restrict motor vehicles, as appropriate.

If multipurpose trails are primarily to serve bicycle travel, they should be developed in accordance with standards for Class I bikeways. In general, multipurpose trails are not recommended as high speed transportation facilities for bicyclists because of conflicts between bicyclists and pedestrians. Wherever possible, separate bicycle and pedestrian paths should be provided. If this is not feasible, additional width, signing and striping should be used to minimize conflicts.

It is undesirable to mix mopeds and bicycles on the same facility. In general, mopeds should not be allowed on multipurpose trails because of conflicts with slower moving bicyclists and pedestrians. In some cases where an alternate route for mopeds does not exist, additional width, signing, and striping should be used to minimize conflicts. Increased patrolling by law enforcement personnel is also recommended to enforce speed limits and other rules of the road.

It is usually not desirable to mix horses and bicycle traffic on the same multipurpose trail. Bicyclists are often not aware of the need for slower speeds and additional operating space near horses. Horses can be startled easily and may be unpredictable if they perceive approaching bicyclists as a danger. In addition, pavement requirements for safe bicycle travel are not suitable for horses. For these reasons, a bridle trail separate from the multipurpose trail is recommended wherever possible.

1003.6 Miscellaneous Bikeway Criteria

The following are miscellaneous bikeway criteria which should be followed to the extent pertinent to Class I, II and III bikeways. Some, by their very nature, will not apply to all classes of bikeway. Many of the criteria are important to consider on any highway where bicycle travel is expected, without regard to whether or not bikeways are established.

(1) Bridges. Bikeways on highway bridges must be carefully coordinated with approach bikeways to make sure that all elements are compatible. For example, bicycle traffic bound in opposite directions is best accommodated by bike lanes on each side of a highway. In such cases, a two-way bike path on one side of a bridge would normally be inappropriate, as one direction of bicycle traffic would be required to cross the highway at grade twice to get to and from the bridge bike path. Because of the inconvenience, many bicyclists will be encouraged to ride on the wrong side of the highway beyond the bridge termini.

The following criteria apply to a two-way bike path on one side of a highway bridge:

(a) The bikeway approach to the bridge should be by way of a separate two-way facility for the reason explained above.

(b) **A physical separation, such as a chain link fence or railing, shall be provided to offset the adverse effects of having bicycles traveling against motor vehicle traffic.** The physical separation should be designed to minimize fixed end hazards to motor vehicles and if the bridge is an interchange structure, to minimize sight distance restrictions at ramp intersections.

It is recommended that bikeway bridge railings or fences placed between traffic lanes and bikeways be at least 1.4 m high to minimize the likelihood of bicyclists falling over the railings. Standard bridge railings which are lower than 1.4 m can be retrofitted with lightweight upper railings or

chain link fence suitable to restrain bicyclists.

Separate highway overcrossing structures for bikeway traffic shall conform to Caltrans' standard pedestrian overcrossing design loading. The minimum clear width shall be the paved width of the approach bikeway but not less than 2.4 m. If pedestrians are to use the structure, additional width is recommended.

(2) *Surface Quality.* The surface to be used by bicyclists should be smooth, free of potholes, and the pavement edge uniform. For rideability on new construction, the finished surface of bikeways should not vary more than 6 mm from the lower edge of a 2.4 m long straight edge when laid on the surface in any direction.

Table 1003.6

BIKEWAY SURFACE TOLERANCES

Direction of Travel	Grooves(1)	Steps(2)
Parallel to travel	No more than 12 mm wide	No more than 10 mm high
Perpendicular to travel	---	No more than 20 mm high

(1) Groove--A narrow slot in the surface that could catch a bicycle wheel, such as a gap between two concrete slabs.

(2) Step--A ridge in the pavement, such as that which might exist between the pavement and a concrete gutter or manhole cover; or that might exist between two pavement blankets when the top level does not extend to the edge of the roadway.

Table 1003.6 indicates the recommended bikeway surface tolerances for Class II and III bikeways developed on existing streets to minimize the potential for causing bicyclists to lose control of their bicycle (Note: Stricter tolerances should be achieved on new bikeway construction.) Shoulder rumble strips are not suitable as a riding surface for bicycles. See Traffic Manual Section 6-03.2 for additional information regarding rumble strip design considerations for bicycles.

(3) *Drainage Grates, Manhole Covers, and Driveways.* Drainage inlet grates, manhole covers, etc., on bikeways should be designed and installed in a manner that provides an adequate surface for bicyclists. They should be maintained flush with the surface when resurfacing.

Drainage inlet grates on bikeways shall have openings narrow enough and short enough to assure bicycle tires will not drop into the grates (e.g., reticuline type), regardless of the direction of bicycle travel. Where it is not immediately feasible to replace existing grates with standard grates designed for bicycles, 25 mm x 6 mm steel cross straps should be welded to the grates at a spacing of 150 mm to 200 mm on centers to reduce the size of the openings adequately.

Corrective actions described above are recommended on all highways where bicycle travel is permitted, whether or not bikeways are designated.

Future driveway construction should avoid construction of a vertical lip from the driveway to the gutter, as the lip may create a problem for bicyclists when entering from the edge of the roadway at a flat angle. If a lip is deemed necessary, the height should be limited to 15 mm.

(4) *At-grade Railroad Crossings and Cattle Guards.* Whenever it is necessary to cross railroad tracks with a bikeway, special care must be taken to assure that the safety of bicyclists is protected. The bikeway crossing should be at least as wide as the approaches of the bikeway. Wherever possible, the crossing should be straight and at right angles to the rails. For on-street bikeways where a skew is unavoidable, the shoulder (or bike lane) should be widened, if possible, to permit bicyclists to cross at right angles (see Figure 1003.6A). If this is not possible, special construction and materials should be considered to keep the flangeway depth and width to a minimum. Pavement should be maintained so ridge

Figure 1003.6A

Railroad Crossings

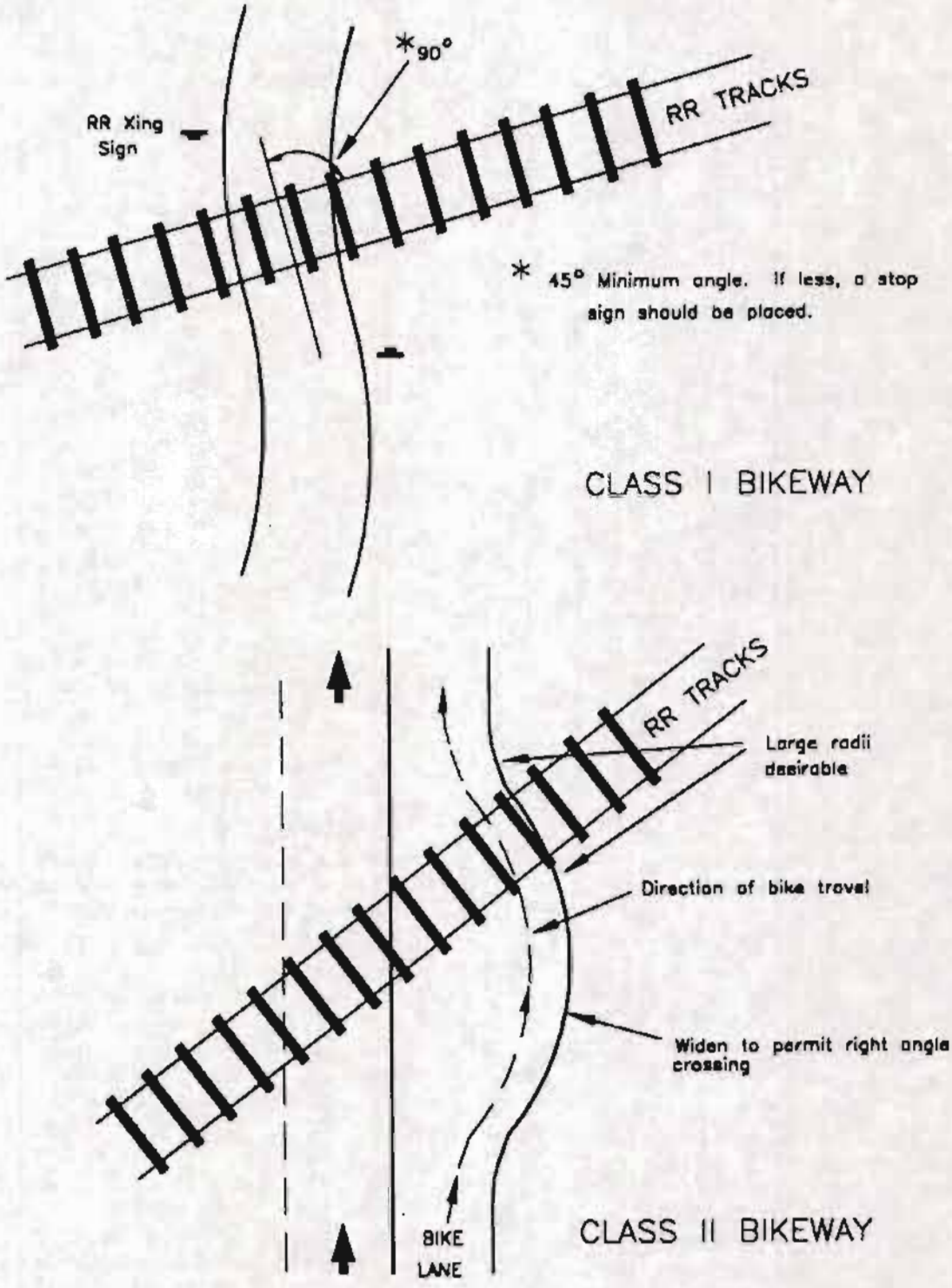
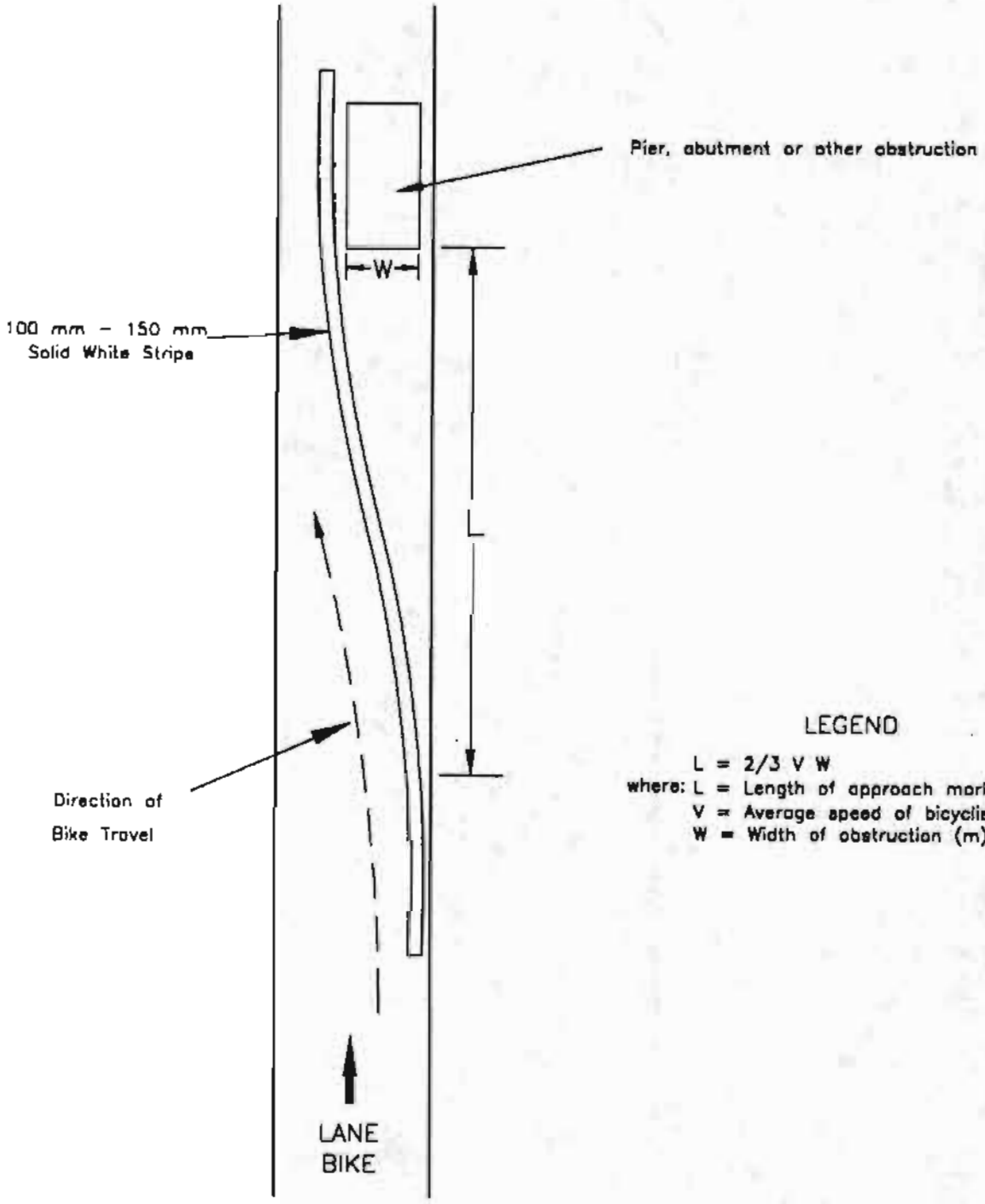


Figure 1003.6B

Obstruction Markings



LEGEND

L = 2/3 V W
where: L = Length of approach marking (m)
V = Average speed of bicyclists (km/h)
W = Width of obstruction (m)

buildup does not occur next to the rails. In some cases, timber plank crossings can be justified and can provide for a smoother crossing. Where hazards to bicyclist cannot be avoided, appropriate signs should be installed to warn bicyclists of the danger.

All railroad crossings are regulated by the California Public Utilities Commission (CPUC). All new bike path railroad crossings must be approved by the CPUC. Necessary railroad protection will be determined based on a joint field review involving the applicant, the railroad company, and the CPUC.

The presence of cattle guards along any roadway where bicyclists are expected should be clearly marked with adequate advance warning.

(5) *Obstruction Markings.* Vertical barriers and obstructions, such as abutments, piers, and other features causing bikeway constriction, should be clearly marked to gain the attention of approaching bicyclists. This treatment should be used only where unavoidable, and is by no means a substitute for good bikeway design. An example of an obstruction marking is shown in Figure 1003.6B. Signs, reflectors, diagonal black and yellow markings, or other treatments will be appropriate in other instances to alert bicyclists to potential obstructions.

Topic 1004 - Uniform Signs, Markings and Traffic Control Devices

1004.1 Introduction

Per Section 891 of the Streets and Highways Code, uniform signs, markings, and traffic control devices shall be used. As such this section is mandatory, except where permissive language is used. See the Traffic Manual for detailed specifications.

1004.2 Bike Path (Class I)

An optional 100 mm yellow stripe may be placed to separate opposing directions of travel. (See Index 1003.1(3) for additional information.) A 0.9 m long stripe with a 2.7 m space is the recommended striping pattern, but may be revised, depending on the situation.

Standard regulatory, warning, and guide signs used on highways may be used on bike paths, as appropriate (and may be scaled down in size). Special regulatory, warning, and guide signs may also be used to meet specific needs.

White painted word (or symbol) warning markings on the pavement may be used as an effective means of alerting bicyclists to approaching hazards, such as sharp curves, barrier posts, etc.

1004.3 Bike Lanes (Class II)

Bike lanes require standard signing and pavement markings as shown on Figure 1004.3. This figure also depicts the proper method of striping bike lanes through intersections. Bike lane lines are not typically extended through intersections. Where motor vehicle right turns are not permitted, the solid bike lane stripe should extend to the edge of the intersection, and begin again on the far side. Where right turns are permitted, the solid stripe should terminate 30 m to 60 m prior to the intersection. A dashed line, as shown in Figure 1004.3, may be carried to, or near, the intersection. Where city blocks are short (less than 120 m), the length of dashed stripe is typically close to 30 m. Where blocks are longer or motor vehicle speeds are high (greater than 60 km/h), the length of dashed stripe should be increased to 60 m.

The R81 bike lane sign shall be placed at the beginning of all bike lanes, on the far side of every arterial street intersection, at all major changes in direction, and at maximum 1 km intervals.

Bike lane pavement markings shall be placed on the far side of each intersection, and may be placed at other locations as desired.

Raised pavement markers or other raised barriers shall not be used to delineate bike lanes.

The G93 Bike Route sign may also be used along bike lanes, but its primary purpose should be to provide directional signing and destination signing where necessary. A proliferation of

Bike Route signs along signed and striped bike lanes serves no useful purpose.

Many signs on the roadway also will apply to bicyclists in bike lanes. Standard regulatory, warning, and guide signs used specifically in conjunction with bike lanes are shown in Chapter 4 of the Traffic Manual.

1004.4 Bike Routes (Class III)

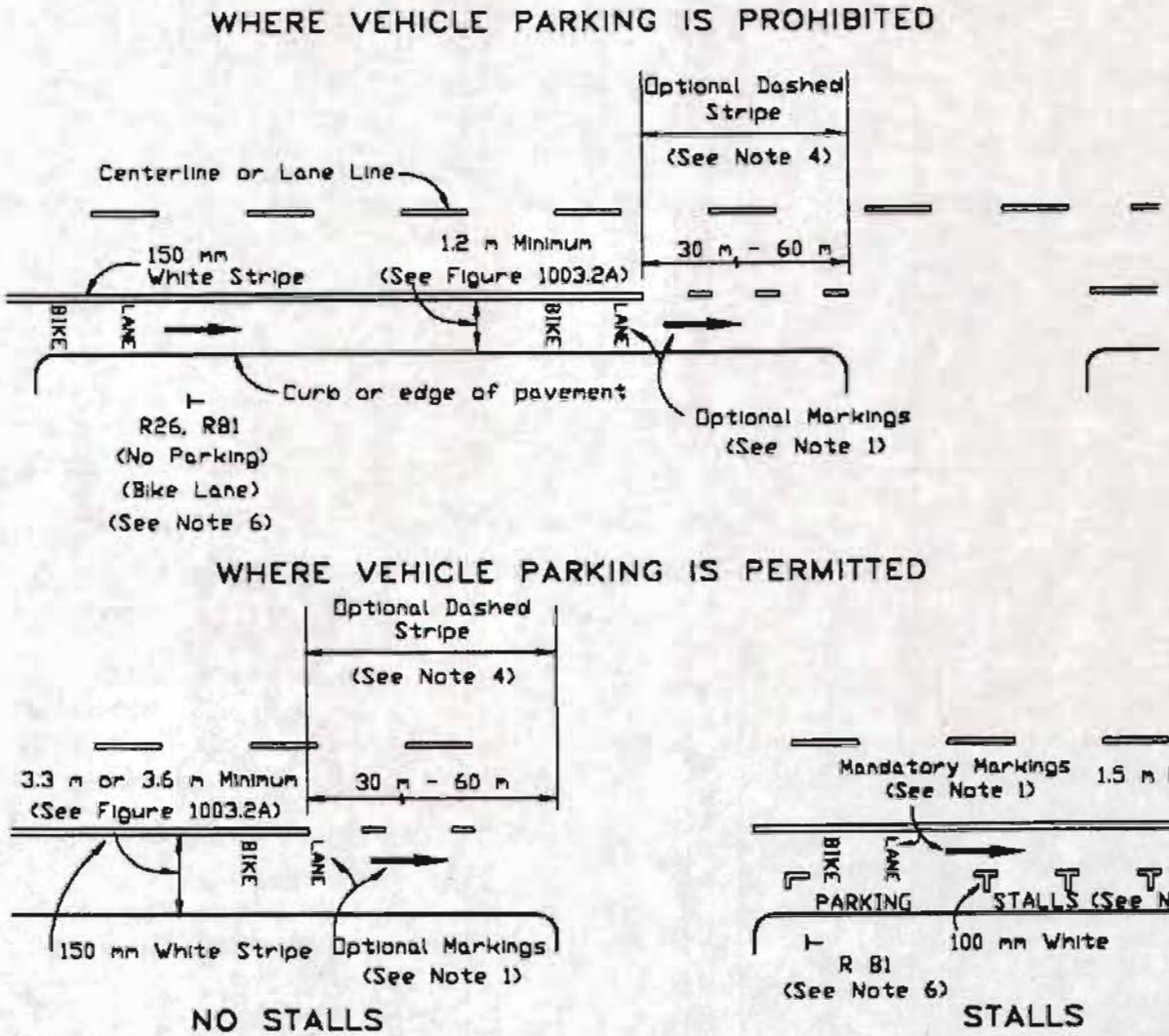
Bike routes are shared routes and do not require pavement markings. In some instances, a 100 mm white edge stripe separating the traffic lanes from the shoulder can be helpful in providing for safer shared use. This practice is particularly applicable on rural highways, and on major arterials in urban areas where there is no vehicle parking.

Bike routes are established through placement of the G93 Bike Route sign. Bike route signs are to be placed periodically along the route. At changes in direction, the bike route signs are supplemented by G33 directional arrows. Typical bike route signing is shown on Figure 1004.4. The figure shows how destination signing, through application of a special plate, can make the Bike Route sign more functional for the bicyclist. This type of signing is recommended when a bike route leads to a high demand destination (e.g., downtown, college, etc.).

Many signs on the roadway also will apply to bicyclists. Standard warning and guide signs used specifically in conjunction with bike routes are shown in Chapter 4 of the Traffic Manual.

Figure 1004.3

Bike Lane Signs and Markings

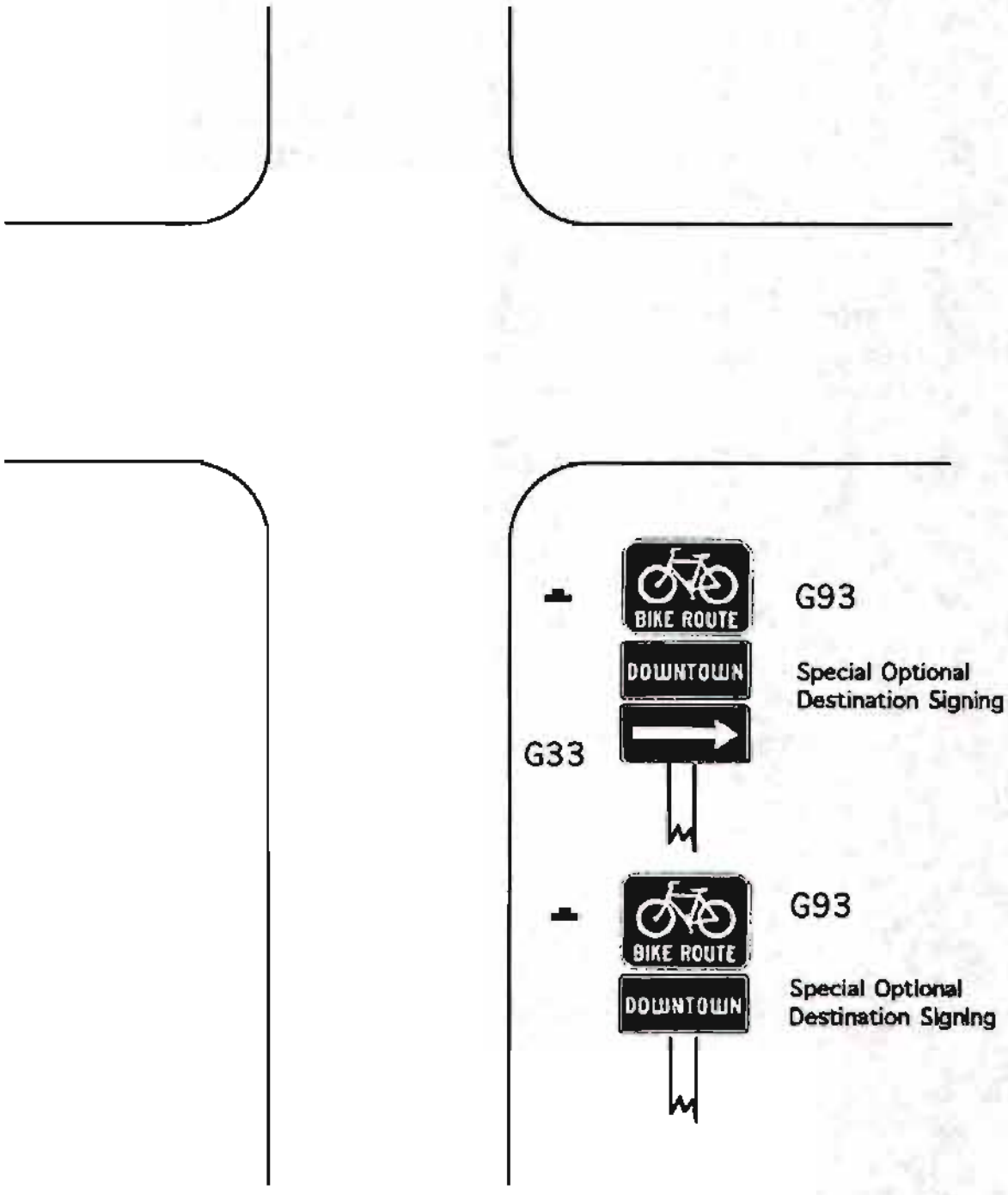


NOTES:

1. The Bike Lane pavement markings shall be placed on the far side of each intersection, and may be placed at other locations as desired.
2. The use of the bicycle symbol pavement marking to supplement the word message is optional.
3. The G93 Bike Route sign may be placed intermittently along the bike lane if desired.
4. Where motorist right turns are permitted, the solid bike lane line shall either be dropped entirely, or dashed as shown, beginning at a point between 30 m and 60 m in advance of the intersection. Refer to Detail 39A in the Traffic Manual for striping pattern dimensions.
5. In areas where parking stalls are not necessary (because parking is light), it is permissible to paint a 100 mm solid white stripe to fully delineate the bike lane. This may be advisable where there is concern that motorists may misconstrue the bike lane to be a traffic lane.
6. The R81 bike lane sign shall be placed at the beginning of all bike lanes, on the far side of every arterial street intersection, at all major changes in direction, and at maximum 0.8 km intervals.

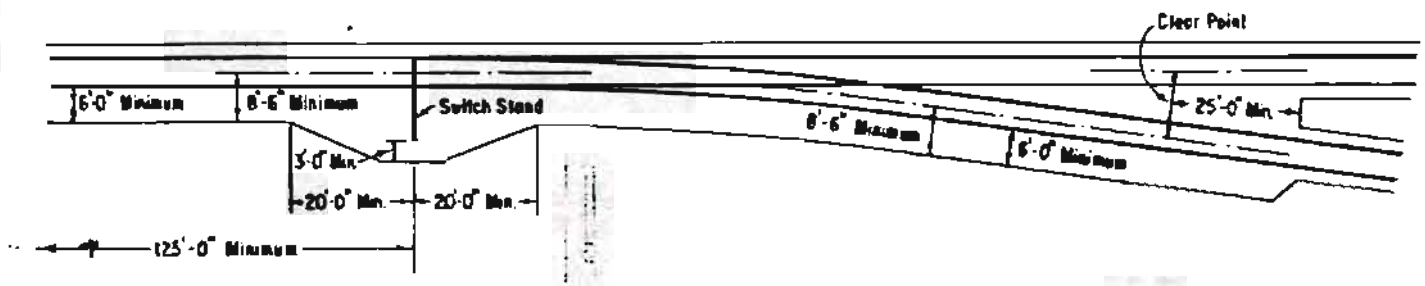
Figure 1004.4

Bike Route Signing



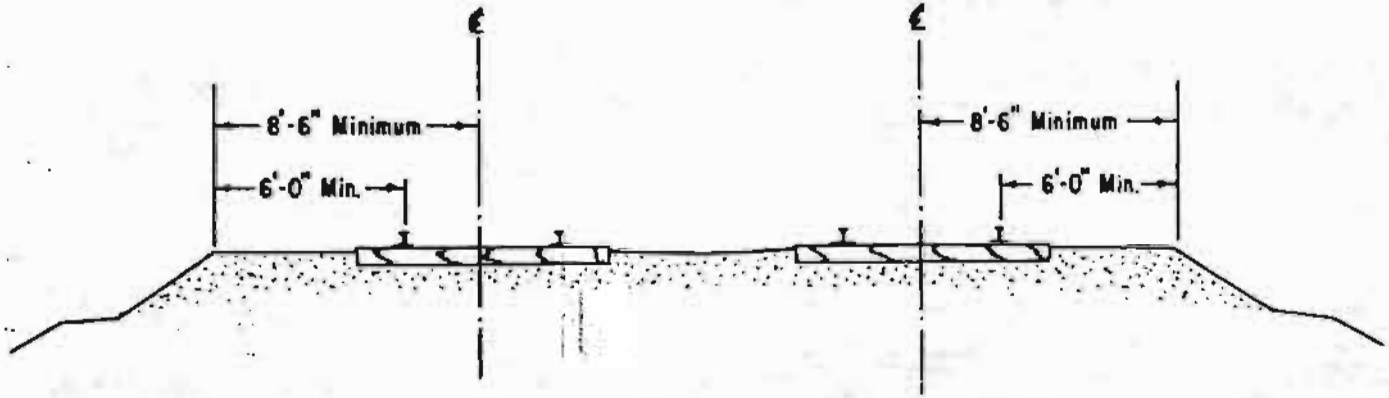
NOTES: The G93 Bike Route signs shall be placed at all points where the route changes direction and periodically as necessary.

APPENDIX J
PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA-STANDARDS



STANDARD No. 3

WALKWAYS AT MAIN LINE SWITCHES ENTERING YARDS AND SERVING INDUSTRY TRACKS EXCEPT AS PROVIDED IN STANDARD No. 5



STANDARD No. 6

WALKWAYS IN YARDS AND POINTS WHERE INDUSTRIAL SWITCHING IS PERFORMED, BUT NOT LESS THAN 50 FT. IN ADVANCE OF SWITCH.

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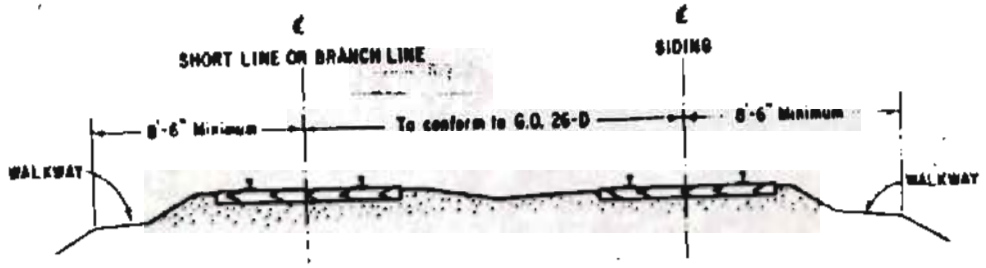
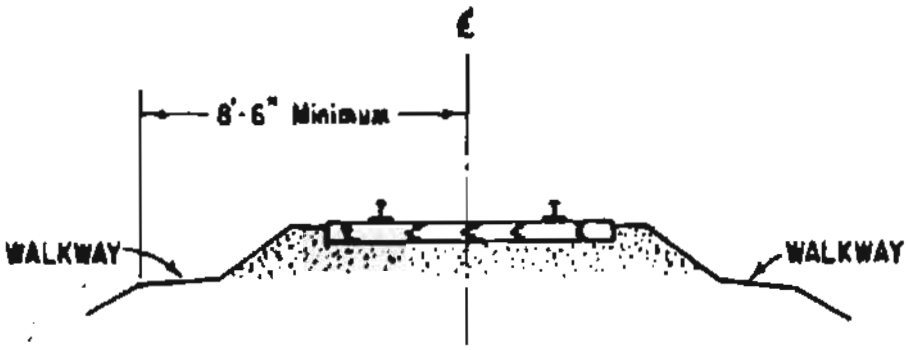
STANDARD No. 2

WALKWAYS ALONG MAIN LINE TRACKS



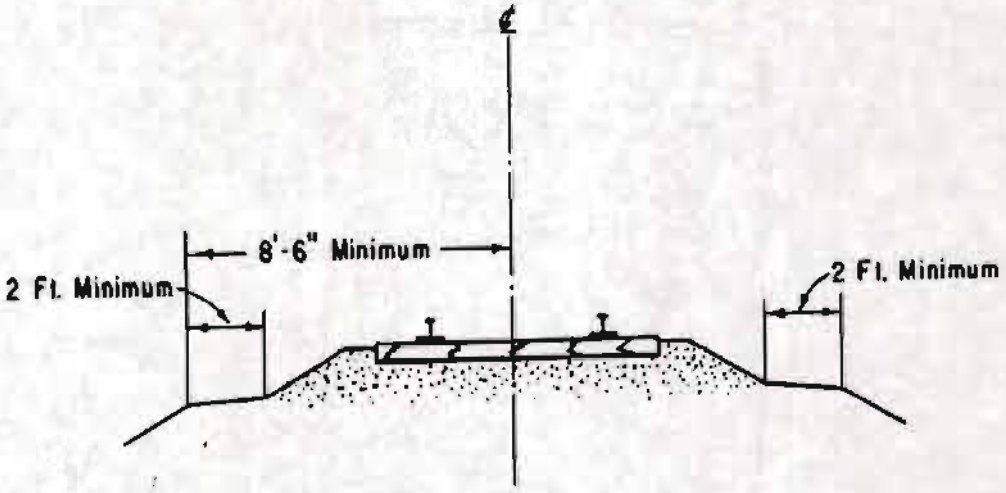
STANDARD No. 2-A

WALKWAYS ALONG SHORT LINE AND BRANCH LINE TRACKS



STANDARD No. 4

WALKWAYS ALONG SHORT LINE AND BRANCH LINE TRACKS



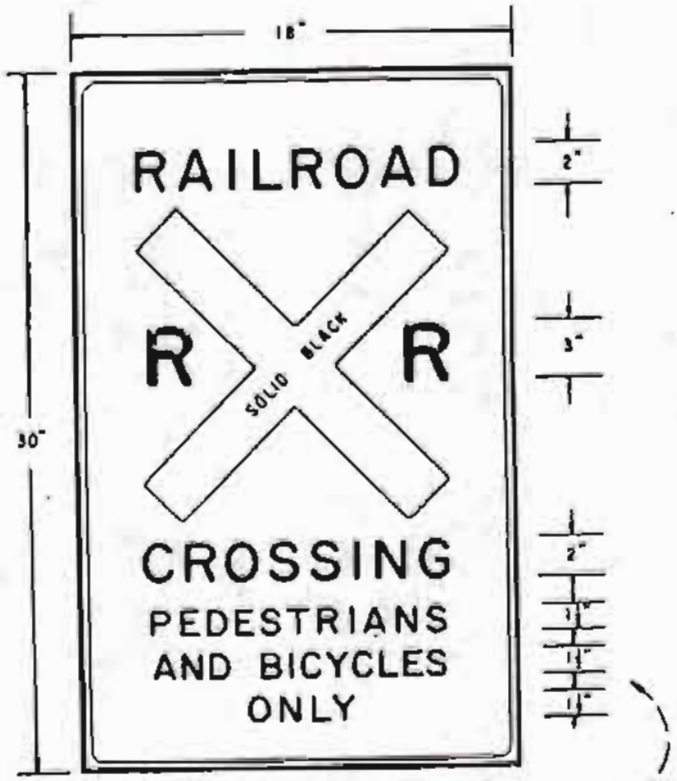
STANDARD No. 1

WALKWAYS ALONG MAIN LINE TRACKS

Figure 2

STANDARD NO. 1-D

PEDESTRIAN AND BICYCLE
RAILROAD GRADE CROSSING SIGN

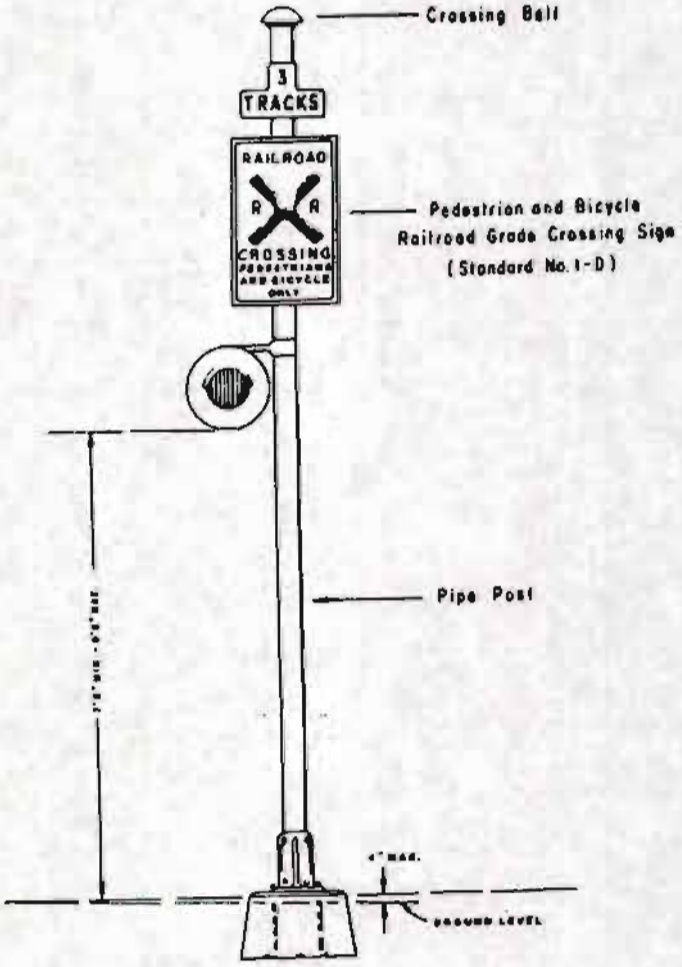


BLACK LETTERING ON WHITE
REFLECTORIZED BACKGROUND

The wording "and bicycles" is optional and may be omitted where appropriate.

C.O. 75-C

Figure 10
STANDARD NO. 10



PEDESTRIAN AND BICYCLE CROSSING PROTECTION
FLASHING LIGHT TYPE

SEE NOTES 1, 2 AND 3, SECTION 8.

G.O. 75-C

APPENDIX K
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