City of Encinitas

ACTIVE TRANSPORTATION PLAN

Administrative Draft April 2018

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INTRODUCTION

SCOPE

This study updates and consolidates the City's active transportation plan to include walking, bicycling and access to transit. The intent of the study is to better address not only local travel needs, but crosstown and regional bicycle and pedestrian travel as well. This resulting document is intended to be responsive to General Plan changes and to bring this document into conformance with the latest Climate Action Plan, complete streets policies, and other local goals and objectives.

Plan objectives included establishing biking and walking facility types, and identifying connections between the City's bikeway system and the regional system. The project's scope included documenting and evaluating Encinitas' existing bikeway facility system and its relationship with other systems such as public transit, and recommending access to transit improvements where appropriate.

This plan sought to maximize the efficiencies offered by multi-modal connections between public transit, walkways and bikeways. This included providing more convenient walking and bicycling facilities for residents who do not have ready access to motor vehicles, as well as encouraging those with access to motor vehicles to consider biking or walking as viable alternatives to driving, especially in a climate particularly conducive to active transportation.

The project study area was the City of Encinitas, but adjoining area's bicycle and pedestrian systems were evaluated for opportunities as connections with Encinitas and to extend the regional network via Encinitas' systems (see Figure 1-1: Study Area).

METHODOLOGY

Encinitas' existing bikeway and walkway system was analyzed for a number of factors using both traditional field survey and geographic information systems (GIS) techniques. Project methodology included a review of applicable documents, field work, extensive community outreach and GIS analysis of the field work and community outreach data. All mapped bicycle routes were first driven to verify accuracy with respect to existing mapping data. Many of these routes were later ridden, especially those that were mentioned in community input, or did not appear to be consistent with the data. These discrepancies were often discontinuous routes or route extensions that had not been previously digitized. Walkways were primarily addressed through GIS analysis.

FIGURE 1-1: Study Area

COMMUNITY INPUT

Community meetings were held in all five neighborhoods to gather input from residents to take advantage of their familiarity with the existing bikeway and walkway system. Input was also sought at other community meetings for related transportation planning as part of the Coastal Mobility and Livability Study (CMLS) process, such as 10 CMLS Working Group meetings, Council workshops and other open houses. In addition, a web-based survey and comment map was developed, as seen in Figure 1-2 (see "Community Input" in Chapter 2).

PROJECT APPROACH

The overall approach taken in this active transportation plan (ATP) can be summarized as the following:

- The ATP should be integrated into all transportation plans.
- An administrative framework and public interest group support is critical for successful ATP implementation.
- The aim of planning for active transportation should not be focused on any particular product so much as it should be focused on safe and efficient bicyclist and walker travel. This generally requires both the use of the existing transportation infrastructure and the construction of special facilities.
- The maintenance of bicycle and walking facilities and the monitoring and assessment of their performance must ensure continuing safe and efficient travel for bicyclists and pedestrians. Active transportation planning is an on-going process.
- The co-existence of bicyclists and drivers on the roads requires that both are sensitive to and recognize a common set of rules. Training, education and enforcement are as important as physical planning and design.

ISSUES

The issues addressed by this active transportation plan were primarily defined by community input, including the following:

Pathway Crossings and Intersections

Project approach addressed the fact that conflicts generally occur at intersections or crossings. The design of intersections, their signage and traffic signals is very important to proper bikeway and walkway system function. Conflict areas were identified with the help of City Staff, the Sheriff's Department, community input and GIS analysis of collision data. The planning team also performed extensive site verification to help define recommendations to address recognized conflict areas.

Integration with Other On-going Studies

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

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

Coastal Mobility and Livability Study (CMLS)

In particular, this active transportation plan was conducted as a component of the CMLS process in conjunction with the Encinitas Rail Corridor Vision Plan and the Business District Parking Study.

City Capital Improvement Program (CIP)

Additionally, the CIP was considered as part of the planning process to ensure recommendations complement facilities already in the planning stage. Relevant CIP projects are shown in Figure 1-3: 2018 CIP List.

FIGURE 1-2: Public Comments by Topic

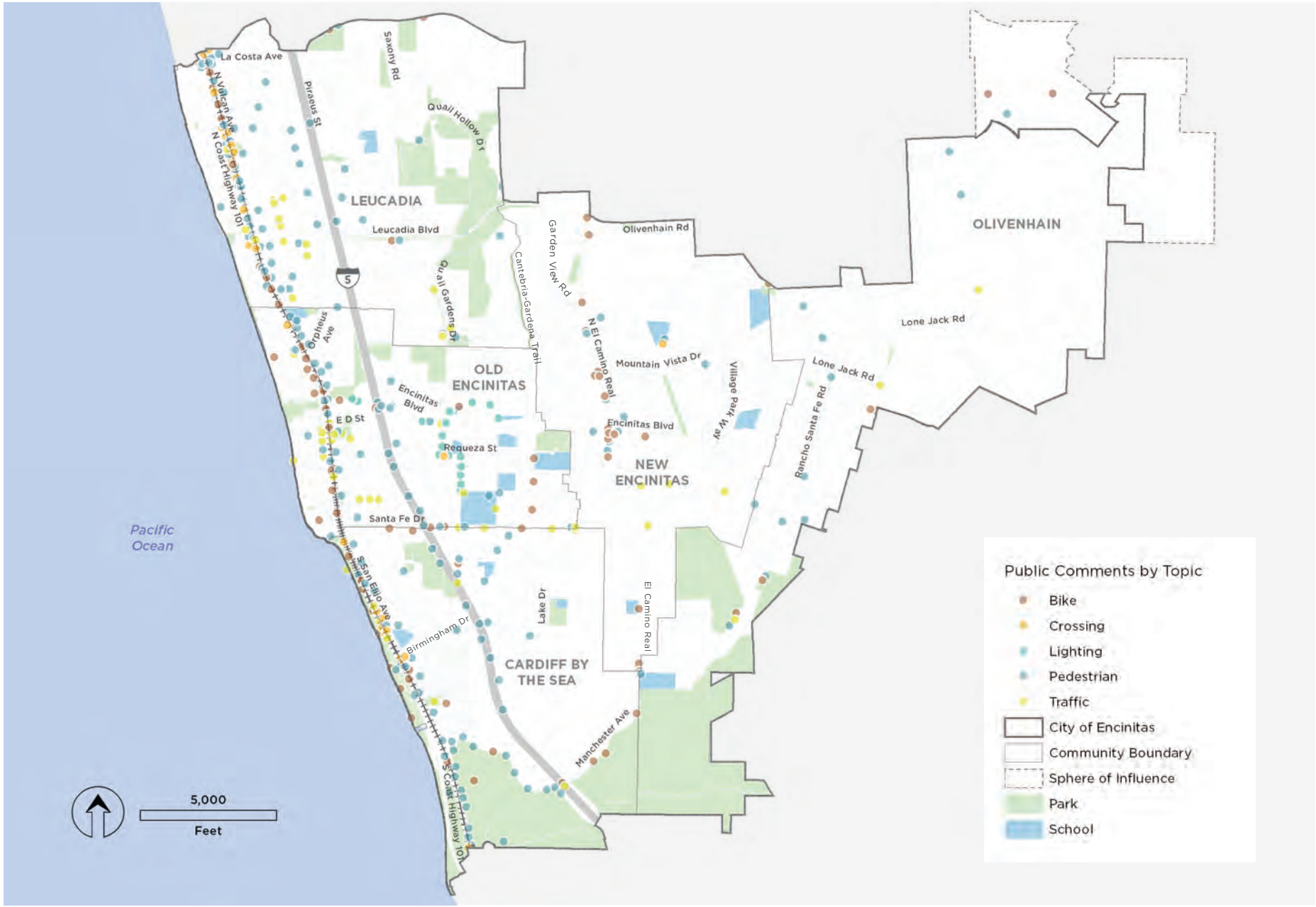
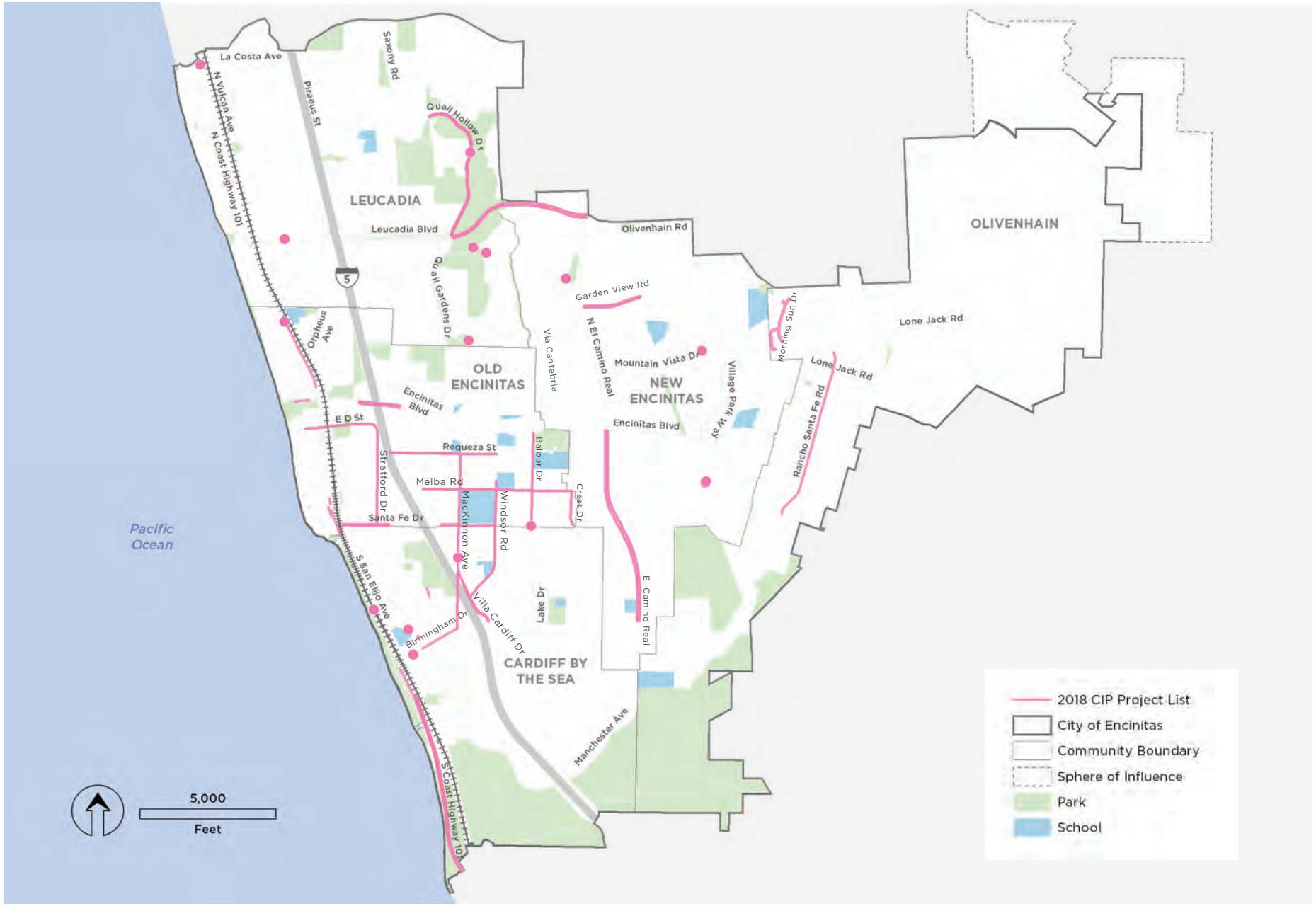


FIGURE 1-3: 2018 CIP List



Climate Action Plan (CAP)

In January 2018, the City of Encinitas approved an updated CAP. This CAP builds upon the goals of the 2011 CAP that provide guidance to the City to achieve statewide reduction targets and adapt to the impacts of climate change. Additionally, an inventory done in 2012 has been included to organize strategies, goals, and actions based on the sectors evaluated. Strategies, such as the incorporation of renewable energy in residential and nonresidential buildings, were incorporated in this document to target greenhouse gas emissions and citywide community and municipal activities.

North Coast Corridor Public Works Plan/ Transportation and Resource Enhancement Program (PWP/TREP)

In order to conduct critical transportation improvements along the North Coast Corridor (NCC) in Northern San Diego County, the San Diego Association of Government (SANDAG) and the California Department of Transportation (Caltrans), in collaboration with the California Coastal Commission, local cities, and other agencies have developed a PWP/TREP. This plan provides an implementation blueprint for a $6.5 million, 40-year program of rail, highway, environmental, and coastal access improvements.

Access to the NCC is limited, resulting in multimodal mobility constraints. Acceptable transportation services and alternative transportation modes, such as improved bicycle and pedestrian facilities, are necessary to ensure public access along the San Diego County coastline. The goal of the PWP/TREP is to accommodate corridor and regional population and travel growth in an environmentally sustainable way.

This large regional transportation project will directly affect this plan's recommendations. The PWP/TREP is a major reconfiguration of the Interstate 5 corridor, including a number of bicycle and pedestrian projects that will run the length of Encinitas, such as freeway crossing improvements and Class I multi-use paths (see Figure 1-4: Proposed PWP Facilities).

SANDAG Coastal Rail Trail

The Coastal Rail Trail is a planned 44-mile continuous bicycle route that runs from Oceanside to Downtown San Diego. The Encinitas segment is intended to provide a comfortable environment for everyone to ride their bicycles regardless of age or skill level. This segment will also improve biking and walking connections to several destinations within Encinitas, such as parks, businesses, beaches, and schools. The first project, which was identified in the PWP/TREP, will provide a 1.3-mile multi-use path along the east side of the railroad tracks near San Elijo Avenue. Construction is expected to begin in March 2018.

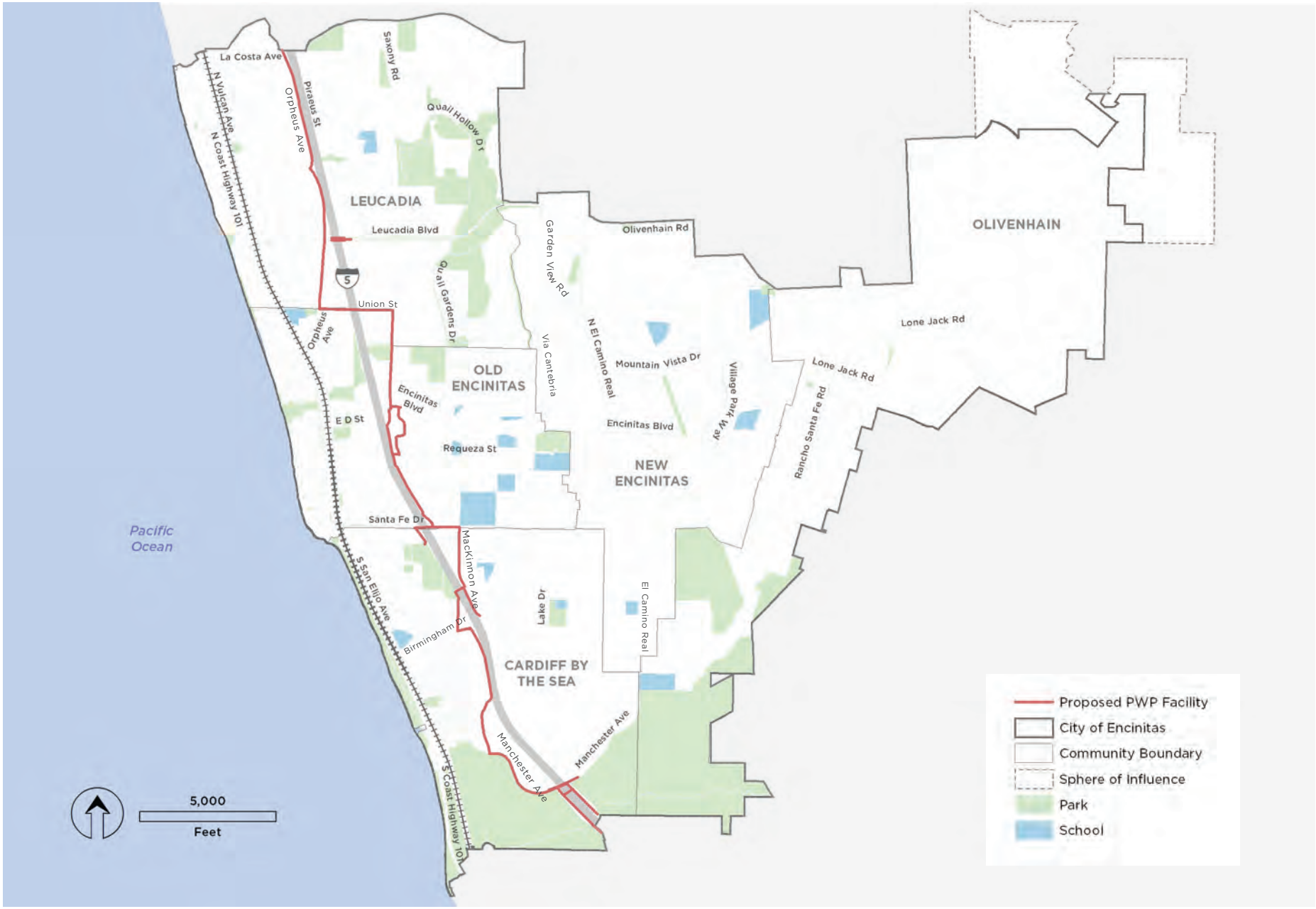
Coastal Rail (LOSSAN) Encinitas Pedestrian Crossings

In 2013, a grade-separated pedestrian crossing was opened at Santa Fe Drive and additional crossings are planned at El Portal and Montgomery/Verdi. The pedestrian crossings will provide access to beaches, schools, commercial areas, and residential neighborhoods across the rail line. In addition to the construction of undercrossings, this project includes pedestrian and landscaping enhancements and improvements to street crossings on adjacent roadways.

Leucadia Streetscape Project

In 2008, the City initiated a streetscape project, also known as Leucadia Streetscape Project, which consists of a 2.5-mile segment of North Coast Highway 101 located in the northwestern section of Encinitas. The purpose of this project is to create a concept plan for beautification, as well as improvements to pedestrian and vehicular circulation and parking. Some of the key components of this project include sidewalks, curbs, gutters, enhanced crosswalks, raised medians, roundabouts, bicycle lanes, increased parking options, and landscaping elements. Based on Encinitas Planning Commission recommendation, the City Council approved the Streetscape project with construction anticipated to commence in late 2018. For more information, see the following City website link: https://tinyurl.com/ybbd8bve.

FIGURE 1-4: Proposed PWP Facilities



PROJECT GOALS

1. Popular - System design and layout will consider all segments of the population.
2. Systemic - The system will endeavor to be a complete system emphasizing local and regional continuity and connectivity.
3. Destination Oriented - The system will be destination-oriented, especially towards employment centers, residential areas and high use activity centers – including access to other modes of local and regional transportation systems.
4. Safe - Safety will be the system's paramount concern, focusing on maximum visibility for users, signage, segment selection and utilizing easily recognized markers to clearly identify routes.
5. Designed to Standards - The system will conform to minimum commonly accepted design standards.
6. Maintained - The facilities should be designed in a manner that will not require frequent maintenance.
7. Minimized Liability Exposure - System design and layout will minimize the City's and adjacent property owners' liability exposure to issues such as trespassing, loss of privacy, damage and property loss associated with routes.
8. Fiscally Responsible - Whenever possible, system design and layout should minimize potential burdens to the City by engaging development to implement segments, locating segments within existing right-of-way and minimizing the need for land acquisition costs.
9. Environmentally Conscious – As much as possible, the system will utilize sensitive routing to minimize environmental impacts.
10. Educationally Oriented - The active transportation plan will consider methods not only to promote the benefits of bicycling and walking, but also to enhance safety by educating pedestrians, bicyclists and drivers to coexist with an awareness of each other.

PROJECT OBJECTIVES

These objectives are oriented along the lines of expected outcomes that can be used to measure the success of the implemented projects.

1. Increase walkers and bicyclists by enhancing existing bicycle and pedestrian facilities and adding new opportunities.
2. Provide bicycle and pedestrian facilities to schools, parks, beaches, transit and trails.
3. Look at opportunities for innovative protected bicycle facilities for the casual user.
4. Connect the full city by addressing natural and man-made barriers to travel.
5. Improve safety at high collision rate intersections.
6. Position the city to increase grant funding.

PROJECT DEFINITIONS

To prevent the confusion that can occur when referring to bikeways, bicycle lanes, routes, trails or paths, the California Department of Transportation (Caltrans) standards for referring to bikeway facility types are used throughout this document. (See accompanying figures and example photos on the following page.)

Bicycle Facilities

Class I Multi-use Pathway

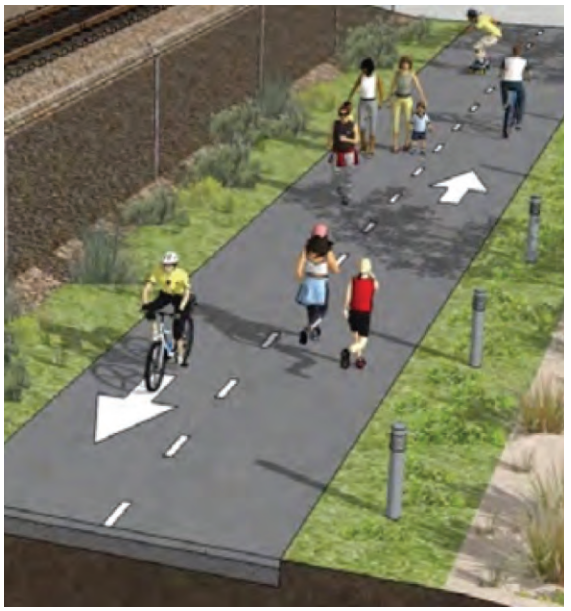
These facilities (often referred to as "bicycle paths") provide exclusive right-of-way for bicyclists and pedestrians with cross flows by motor vehicles kept to a minimum. They are physically separated from motor vehicle routes. Most are two-way, but one-way facilities are addressed in Caltrans' standards.

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

The paths should be wide enough (10 feet minimum) to accommodate multiple user types and should include an unpaved side path (2 to 4 feet) for users who prefer a softer surface.

Class II Bicycle Lanes

These are one-way facilities within roadways placed next to the curb or parking lane for the preferential use by bicyclists within the paved area of streets. They are designated by striping, pavement markings and signage. Class II facilities must be at least five feet wide where no parking occurs and six feet wide where parking does occur. Class II facilities are in place throughout the eastern portion of Encinitas east of Interstate 5. Class II lanes may be used where roadway speeds and ADTs are fairly high, but adequate roadway width is available. Directness and number of users are significant factors.



Class I Multi-use Pathway

Class II Bicycle Lane

Class IIB Buffered Bicycle Lane

Class III Bicycle Route

Class IIIB Bicycle Boulevard

Class IIB Buffered Bicycle Lane

In many cases, roadway width allows for upgrading typical Class II lanes to buffered bicycle lanes, often by repurposing a small amount of width from each vehicle travel lane during typical resurfacing and repainting operations to provide paint-demarcated buffering for the adjacent bicycle lane. The additional buffered width helps to visually separate the bicycle lane from vehicle traffic lanes or parking lanes, or both, and helps to direct bicyclists to ride away from potential car doors opening into their path.

Class III Bicycle Route

These facilities are one-way routes within the street right-of-way and share the travel lane, designated by signage and shared lane markings ("sharrows") only, without striping.

Class IIIB Bicycle Boulevard

These facilities are one-way routes within the street right-of-way and share the travel lane, designated by signage and special lane markings, as well as specific enhancements to enhance the street to support bicycle travel, such as traffic diverters, curb extensions, and other traffic calming measures.

Class IV Cycle Track

These facilities are within the street right-of-way along the curb, physically separated from vehicular traffic by barriers and/or vehicle parking and intended specifically for bicyclist use. They may be one- or two-way.

Class IV Cycle Track

Pedestrian Facilities

In addition to the Class I multi-use paths noted previously that are shared with bicyclists and other users, there are also four other categories of walking facilities. Figure 2-1: Existing Pedestrian Facilities, illustrates the relative extent of such facilities throughout Encinitas. Not all neighborhoods have sidewalks, especially the older, single family residential neighborhoods with substantial slopes.

Type 1 Nature Trail

A natural trail uses only native soils or natural materials for the surface. The walking area is generally from one to four feet wide. This trail type is not normally ADA accessible due to the surface and more abrupt changes in elevation and surface treatments. This pedestrian facility is normally used for recreation but can be used as a short cut for pedestrians trying to transport themselves from an origin to destination.

Type 2 Recreation Trail

A recreation trail is a natural trail surface, but is more compacted than a nature trail. By definition, it must meet ADA requirements on a firm surface and maximum slopes and barriers. The trail could be made with decomposed granite that has been heavily compacted or stabilized through emulsifiers or other concrete or natural products. The trail surface should be a minimum of four feet wide and a maximum of eight feet wide.

Type 3 Road Edge Enhancement

This pedestrian facility is designed to fit into neighborhoods where standard sidewalks do not exist and are either not wanted or technically difficult to work into a street due to limited street right of way widths. This type of facility can be considered to be ADA compatible as long as 30 inches of the roadway edge is made up of firm surfaces. Slopes of the street are not required to meet ADA maximum vertical slopes since they are attached to the edge of the roadway and this slope is exempt from requiring ADA maximum grades from being required. The intent of this walk route, is to provide a continuous firm surface for people walking along the streets where sidewalks are not available. The area should be identified by a solid white stripe or other edge treatment like a concrete short curb, bender board, metal edge, or other defining edge. The surface can be existing asphalt, concrete or highly compacted decomposed granite, or chip seal material that is flat and easy to walk on. Signage is suggested for wayfinding as a city walk route and to communicate “watch for pedestrians” and “No parking on marked road edge route.”

Type 1 Nature Trail

Type 2 Recreation Trail

Type 4 Sidewalk

This is the standard type curb, curb and gutter or raised walkway that is typically concrete or asphalt. These walkways should be no less than four feet wide and must meet ADA cross pitch limitations and corner ramp requirements.

Type 5 Multi-use Pathway (Class I Multi-use Path)

This facility type has been explained previously. It must include firm surfaces and strive to meet all ADA requirements. These pathways need to be at least 8 feet wide when only used by a low volume of bicyclists (plus two foot graded edges level with the path). If pedestrian volumes are likely to be high, minimum width needs to be 10 feet, and more preferably 12 feet with parallel two foot firm surface side trails. The path surface must be firm and can consist of asphalt, concrete, permeable asphalt, permeable concrete, chip seal compacted material, emulsified and stabilized decomposed granite, or other surface capable of supporting moderately skinny bicycle and wheelchair wheels.

Type 4 Sidewalk

Type 5 Multi-use Pathway

TABLE 1-1: Transportation Related Bicycle and Pedestrian Facilities

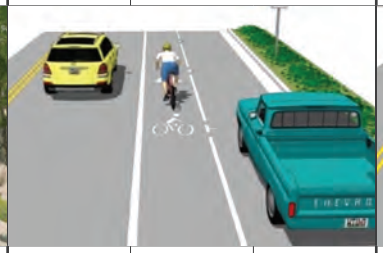
1: PATHS AWAY FROM STREETS (Class I Multi-use Paths)			2: BICYCLE LANES NEXT TO TRAVEL LANES (Class II)			3: BICYCLES SHARING TRAVEL LANES (Class III)			4: SEPARATED CYCLE TRACKS (Class IV - Bicycles Only)			5: PEDESTRIAN ONLY WALKING FACILITIES (attached to streets)		
1a	Separated Multi-use Path		**2a**	Standard Bicycle Lane		**3a**	Bicycle Route with Sharrows		**4a**	Two-way Cycle Track with Barrier		**5a**	Standard Contiguous Sidewalk	
														
INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE	INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE	INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE	INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE	INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE
> 5' buffer from road needed	8'-12' path with centerline	2' graded shoulder (each side)	standard travel lane	4'-8' marked lane with lane symbols (min. 5' if adjacent parking or gutter and curb)	curb or 7'-8' parking lane	shared with standard travel lane	11'-14' travel lane (min. 3' offset from parked cars or in the center of the lane)	7'-8' parking lane	2'-4' with 3' high barrier or 9" raised median	8'-12' lane with centerline	2' graded shoulder, fogline or walkway	travel lane, parking lane or bicycle lane	4'-8' inside of a 6" tall / wide curb	adjacent land uses or buildings
			2b	Outside Buffered Bicycle Lane		**3b**	Bicycle Boulevard		**4b**	One-way Cycle Track with Parking Buffer		**5b**	Road Edge Enhancement	
See facility 1a on previous row														
			2' - 4' buffer stripe with chevron markings	5'-6' lane with standard lane symbols	raised curb	shared travel lane	11'-16' travel lane with special bikeway boulevard symbols, signage and occasional vehicle diverters	parking or edge of roadway	7'-8' parking lane with 2-3' painted buffer with vertical delineators	4'-6' painted lane with symbols	3'-4' parkway planter separating from walking edge	travel lane	4'-5' walkway	adjacent land uses or buildings

TABLE 1-1: Transportation Related Bicycle and Pedestrian Facilities (Cont.)

1: PATHS AWAY FROM STREETS (Class I Multi-use Paths)	2: BICYCLE LANES NEXT TO TRAVEL LANES (Class II)			3: BICYCLES SHARING TRAVEL LANES (Class III)	4: SEPARATED CYCLE TRACKS (Class IV - Bicycles Only)			5: PEDESTRIAN ONLY WALKING FACILITIES (attached to streets)		
	2c	Bicycle Lane Buffered on Both Sides			**4c**	One-way Cycle Track with Post or Flexible Barrier		5c	Road Edge Enhancement	
See facility 1a on previous page				See facility 3a and 3b on previous page						
	INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE		INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE	INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE
	2'-3' buffer stripe with chevron markings	4'-6' lane with standard lane symbols	2' stripe buffer with chevron markings against 7'-8' parking		2' buffer stripe with delineators or barriers	4'-6' lane with symbols	curb next to walkway or parkway	6" stripe	2' asphalt surface	7' gravel parking area

TABLE 1-2: Recreation Related Bicycle and Pedestrian Facilities

A: NATURE TRAILS (Soft Surface/non-ADA compliant surface and/or grades)			B. RECREATION TRAILS (ADA compliant Firm Surface with <8% grades)		
A-1	Level Nature Trails (Soft Surface)		**B-1**	Level Recreation Trails (Firm Surface)	
					
INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE	INNER EDGE	PRIMARY TRAVEL SURFACE	OUTER EDGE
vegetation	2'-4' soft surface trail with mostly level (<8% slope)	vegetation	vegetation with edging	4'-8' firm surface trail - mostly level (<5% slope)	vegetation with edging

STAKEHOLDERS

California Department of Transportation (Caltrans)

Caltrans is the state's manager of interregional transportation services, including promoting the use of alternative modes of transportation. Caltrans coordinates and distributes federal active transportation funding in California and reviews all active transportation plans.

North County Transit District (NCTD)

NCTD buses serve passengers in the north San Diego County region, which includes the area to the south including Del Mar, east to Escondido, north to the Orange County and Riverside County lines, and includes Camp Pendleton. The region is more than 1,000 square miles in area and has a population of approximately 842,000 people. NCTD's bus fleet carries more than 12 million passengers every year. All standard buses are equipped with bicycle racks.

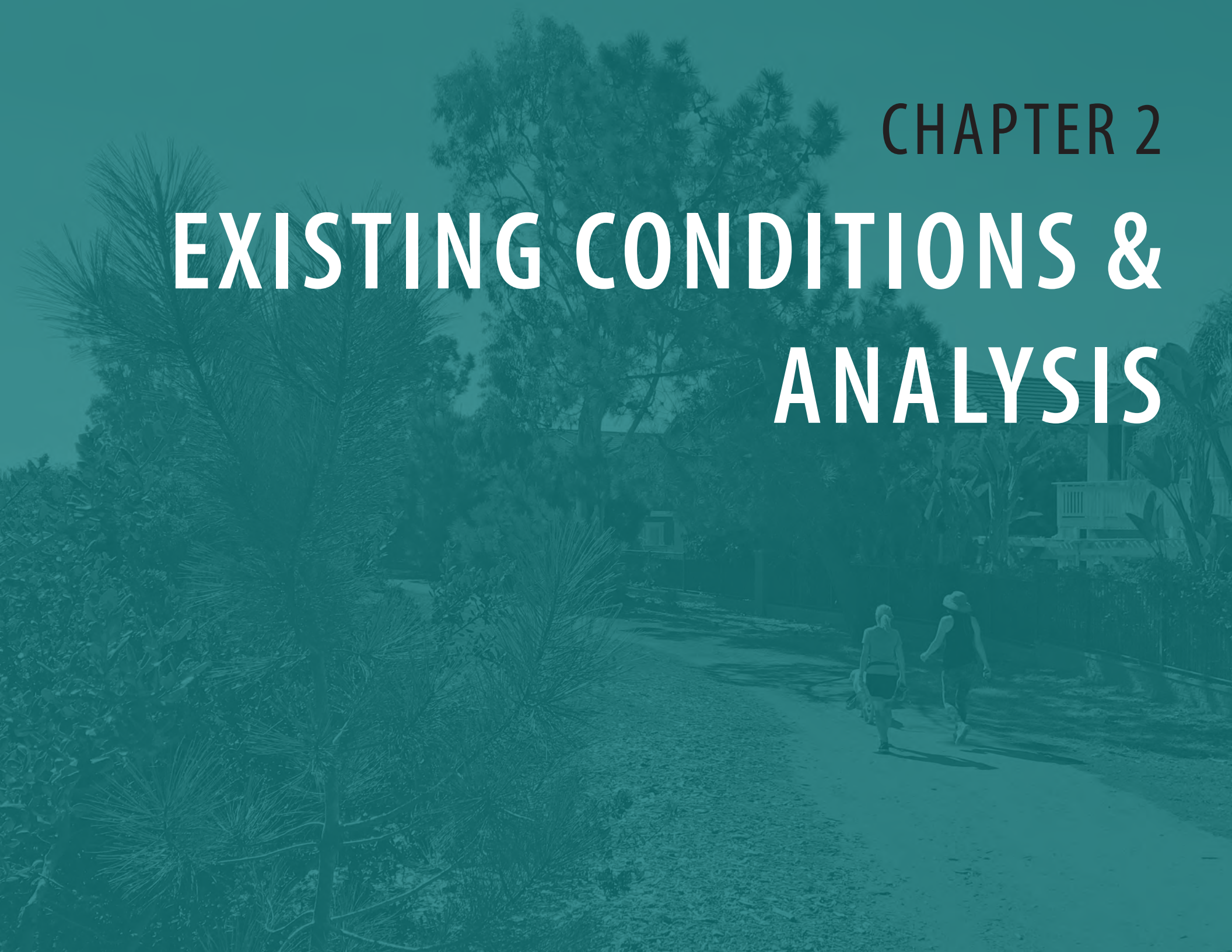
San Diego Association of Governments (SANDAG)

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

California Coastal Commission (CCC)

The California Coastal Commission is an independent, quasi-judicial state agency that carries out coastal zone land and water use planning and regulation. Coastal policy implementation is accomplished through partnership with coastal cities and their individual adopted Local Coastal Programs (LCP), including Encinitas.

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



CHAPTER 2
EXISTING CONDITIONS & ANALYSIS

EXISTING BICYCLE AND PEDESTRIAN FACILITIES

Figures 2-1 and 2-2 illustrate the extent of bicycle and pedestrian facilities in Encinitas. The most widely implemented bicycle facility type and with the longest segments is Class II bicycle lanes, followed by some shorter Class III bicycle route segments. There is one segment of Class IIB buffered bicycle lane on La Costa Avenue between North Vulcan Avenue and Interstate 5.

TRIP ORIGINS

In the context of active transportation plan analysis, "trip origins" are defined as areas or specific locations from which the majority of bicycling and walking is likely to come. Determining where these trip origins are now or will be in the future is important in guiding the design and implementation of a cost-effective active transportation system that will maintain its usefulness over time. This includes tracking projected changes in land use, population, and housing density.

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

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

Most of the population statistics used to perform this trip origin analysis were derived from regional demographic data obtained from SANDAG and the U.S. Census Bureau. SANDAG provided the land use data needed to produce the maps for this chapter. These data sources were used primarily to determine potential trip origins through evaluating existing and proposed housing and employment densities, and land use.

Existing Sidewalk in Encinitas


Existing Bike Lane in Encinitas

FIGURE 2-1: Existing Pedestrian Facilities

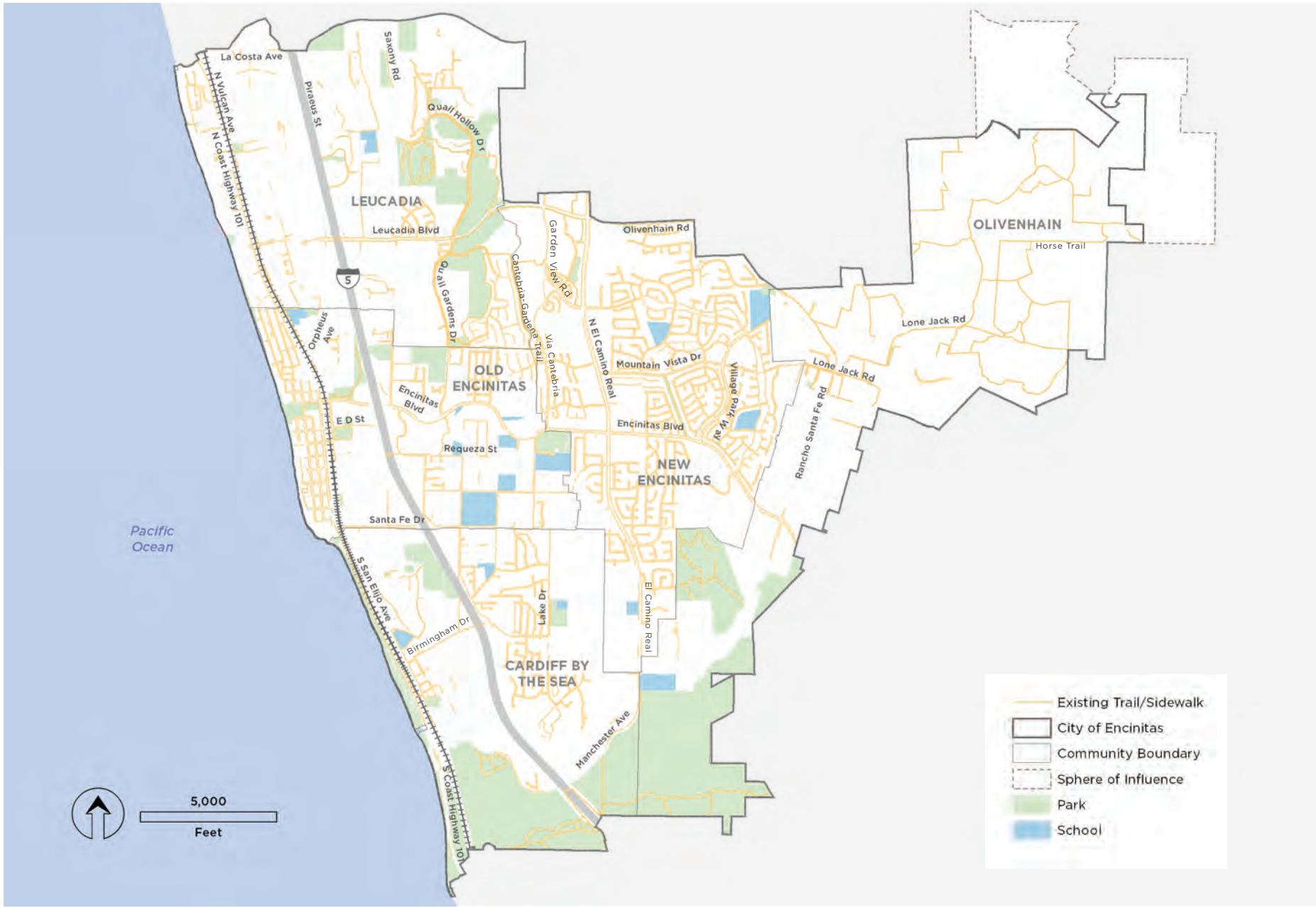
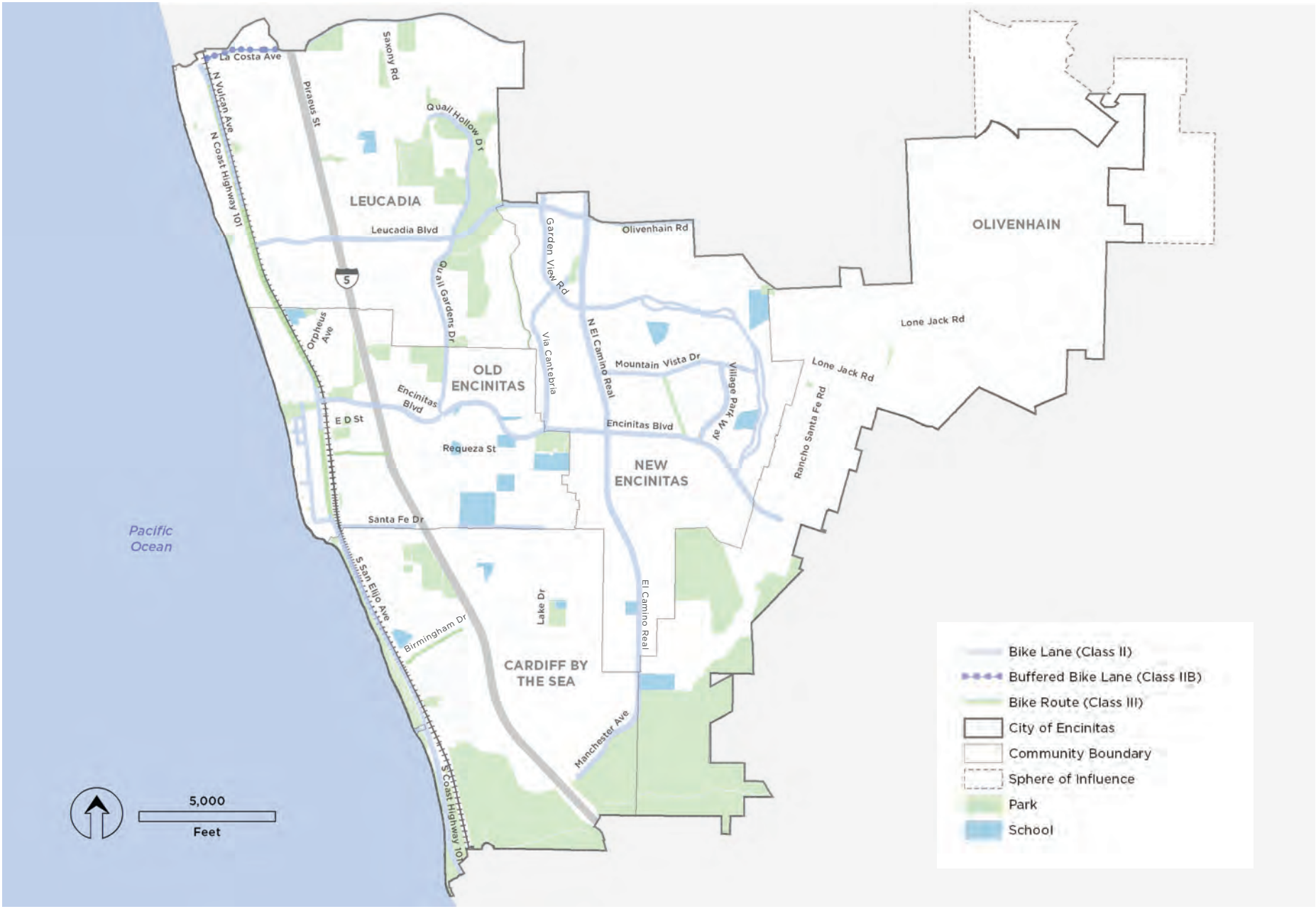


FIGURE 2-2: Existing Bicycle Facilities



Commercial Uses Along Coast Highway 101

Residential Development on Encinitas Boulevard

LAND USE

Existing land use patterns in Encinitas are defined, for the most part, by a fairly conventional urban street pattern of primarily low and moderate density residential development interspersed with pockets of many other land uses such as public services and industrial. The concentrations of commercial, office and moderate density residential land use occur primarily along the major thoroughfares, such El Camino Real, Encinitas Boulevard, and Coast Highway 101. Current and planned land use are shown in Figures 2-3 and 2-4.

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

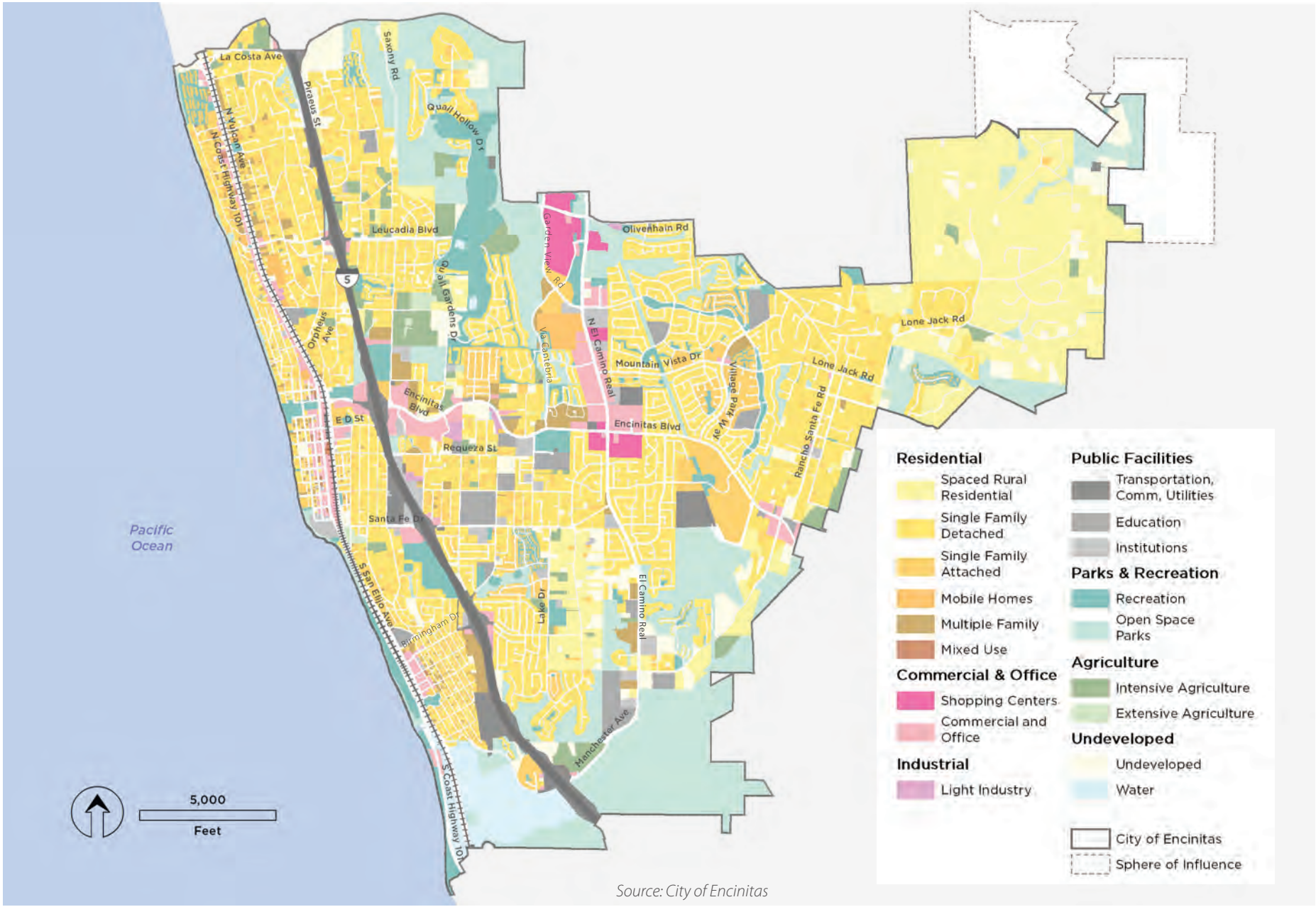
EXISTING RESIDENTIAL AREAS

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

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

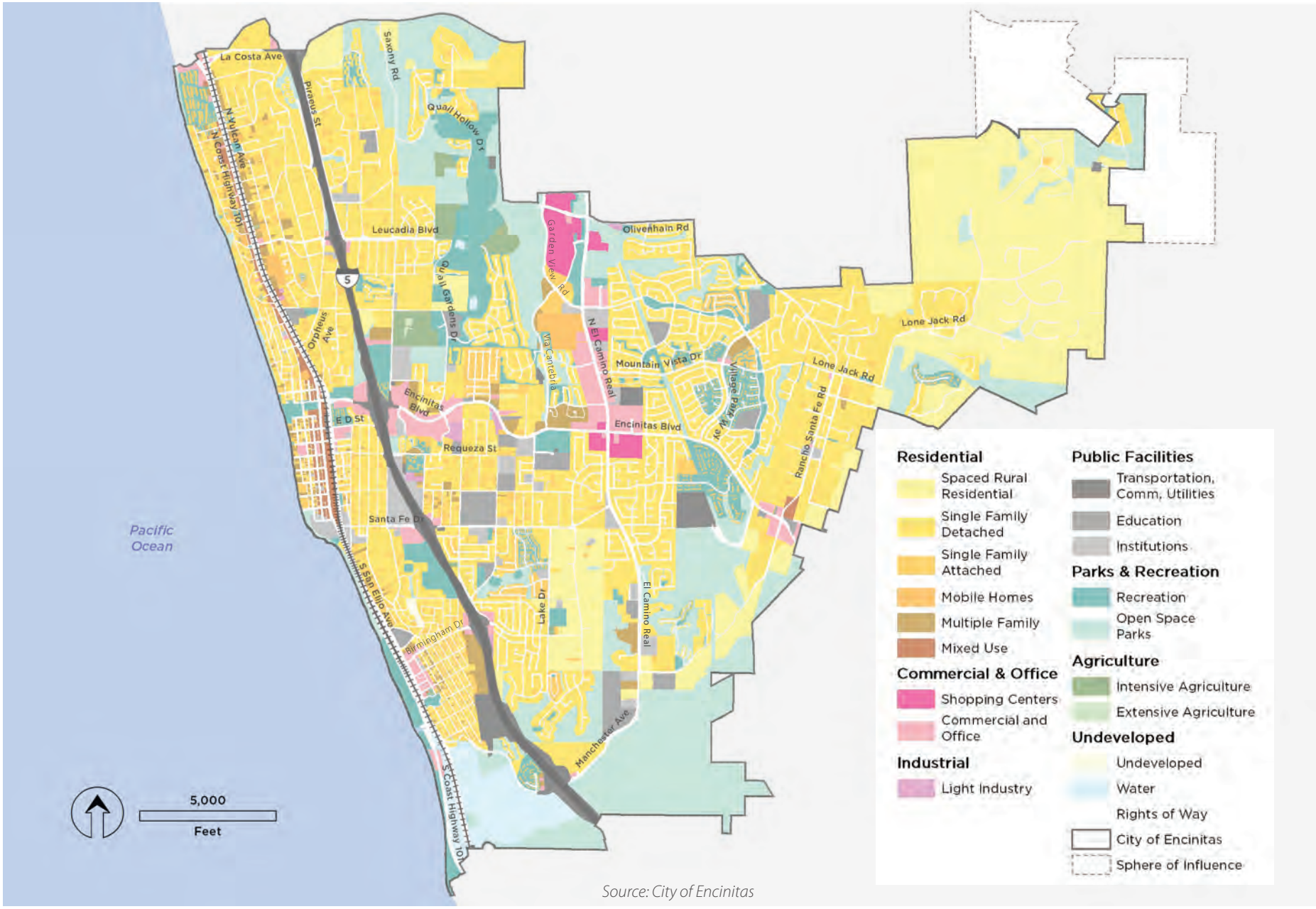
The proportion of online survey respondents using active transportation (bicycling or walking) for trips such as commuting to work or school, recreation and exercise purposes, was 53 percent, somewhat higher than the 47 percent who drove alone. All use categories are likely to occur throughout the City, but recreational riding may occur more in the coastal portion of Encinitas. Riding for exercise is also likely to occur along the coastal strip, but it can occur throughout the City. Commuter riding may occur anywhere, but commuters are more likely to use more direct routes such as arterials.

FIGURE 2-3: Current Land Use



Source: City of Encinitas

FIGURE 2-4: Planned Land Use



Source: City of Encinitas

EXISTING POPULATION AND HOUSING DENSITY

Population density and housing density are not precisely the same characteristic, but they generally correlate with each other. Both the highest population and housing densities occur in "downtown" Encinitas, near the city "center" in the west central portion of the City and in several other distinct areas such as Cardiff and a large area just east of North El Camino Real just south of Olivenhain Road. (See Figure 2-5: 2016 Population Density and Figure 2-6: 2016 Housing Density.)

Future population and housing densities in Encinitas exhibit the expected trend of moderate increases in SANDAG's year 2050 projections compared to 2016. The areas of highest density display a trend to outward expansion while remaining essentially contiguous, with the largest change occurring in the central portion of the city area directly abutting El Camino Real between Leucadia Boulevard and Santa Fe Road. This is projected to become a substantial area of high density residential development. (Figures 2-7: 2050 Population Density and 2-8: 2050 Housing Density.)

Existing Residential Neighborhood Near the West Central Portion of Encinitas

FIGURE 2-5: 2016 Population Density

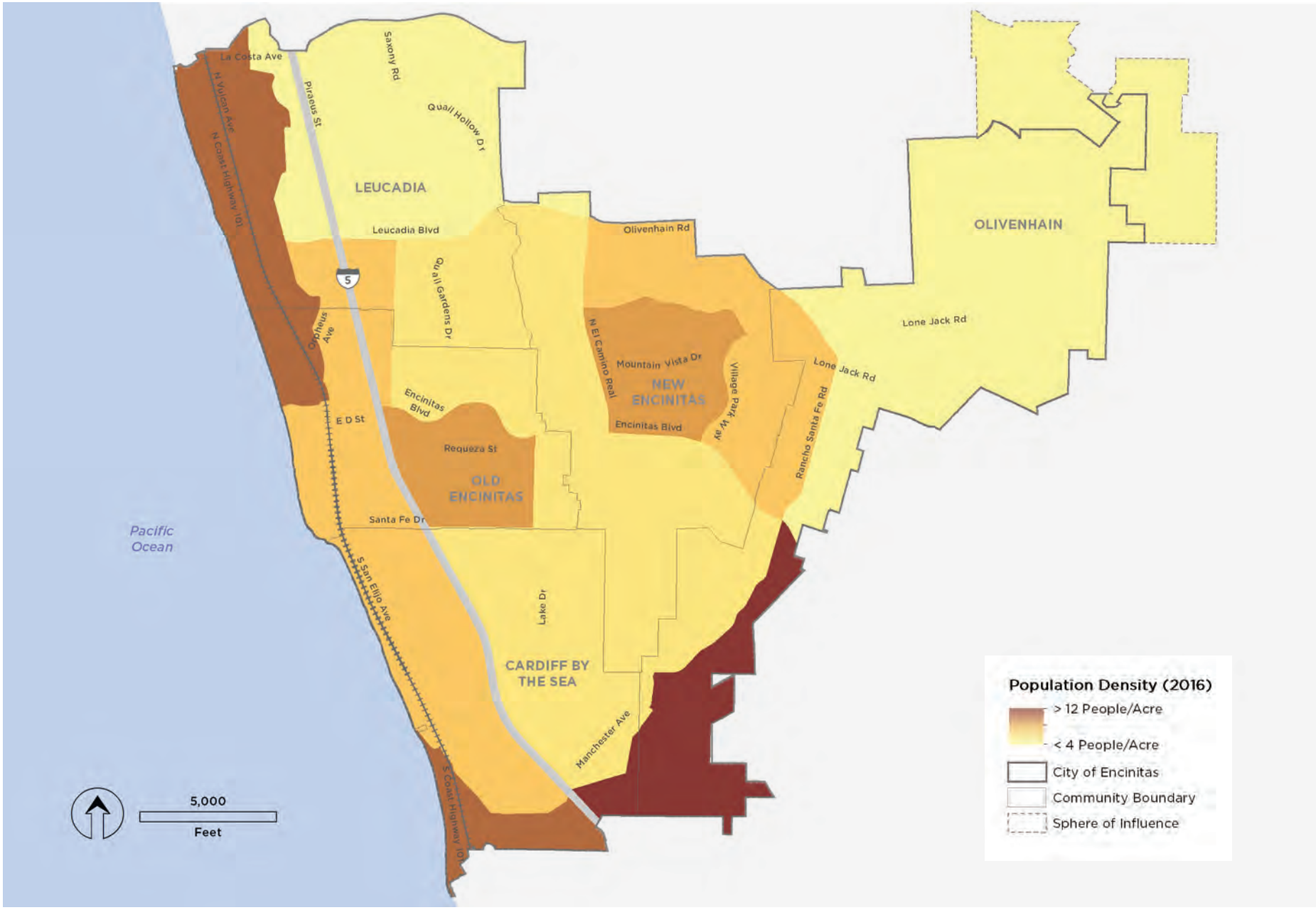


FIGURE 2-6: 2016 Housing Density

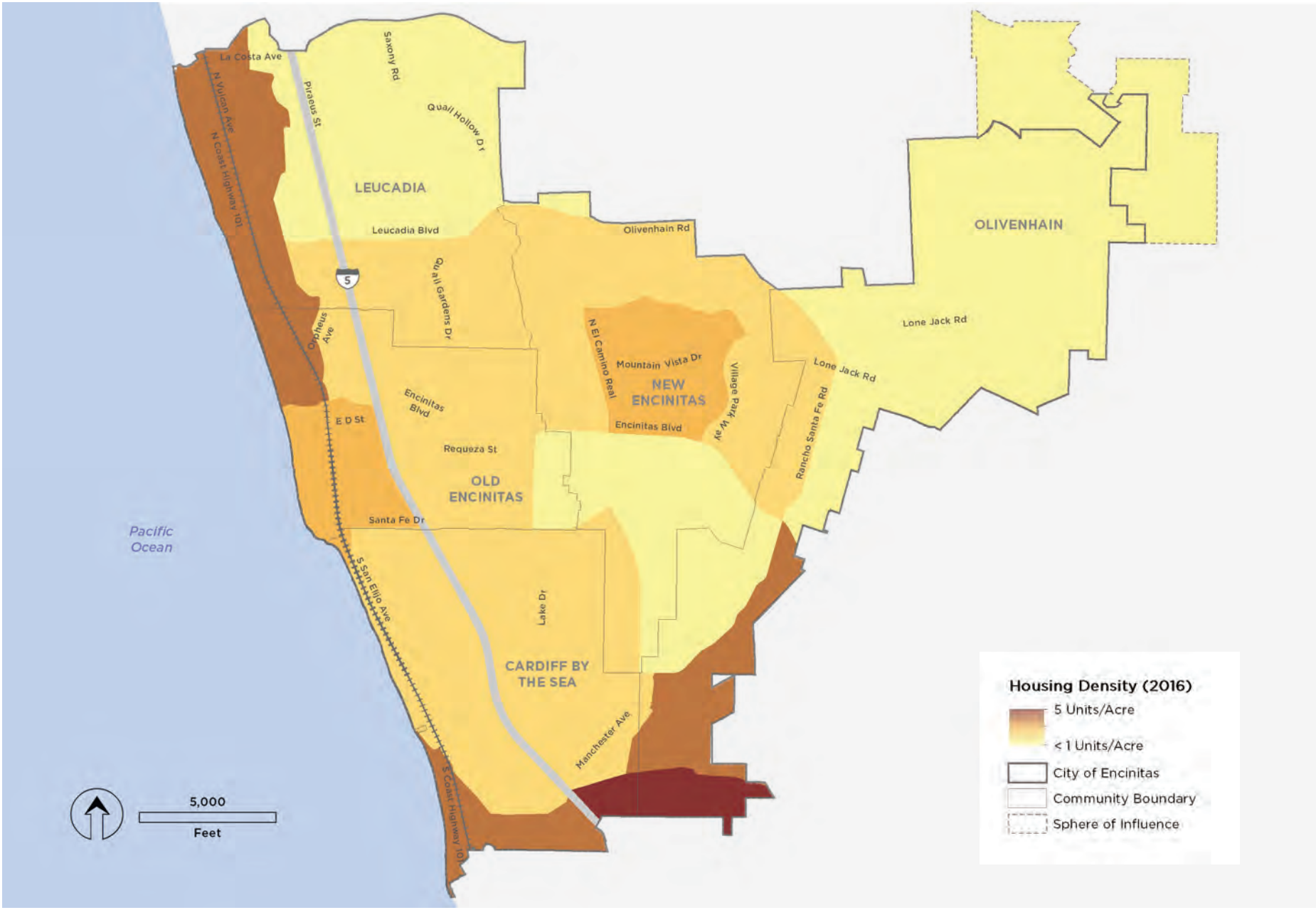


FIGURE 2-7: 2050 Population Density

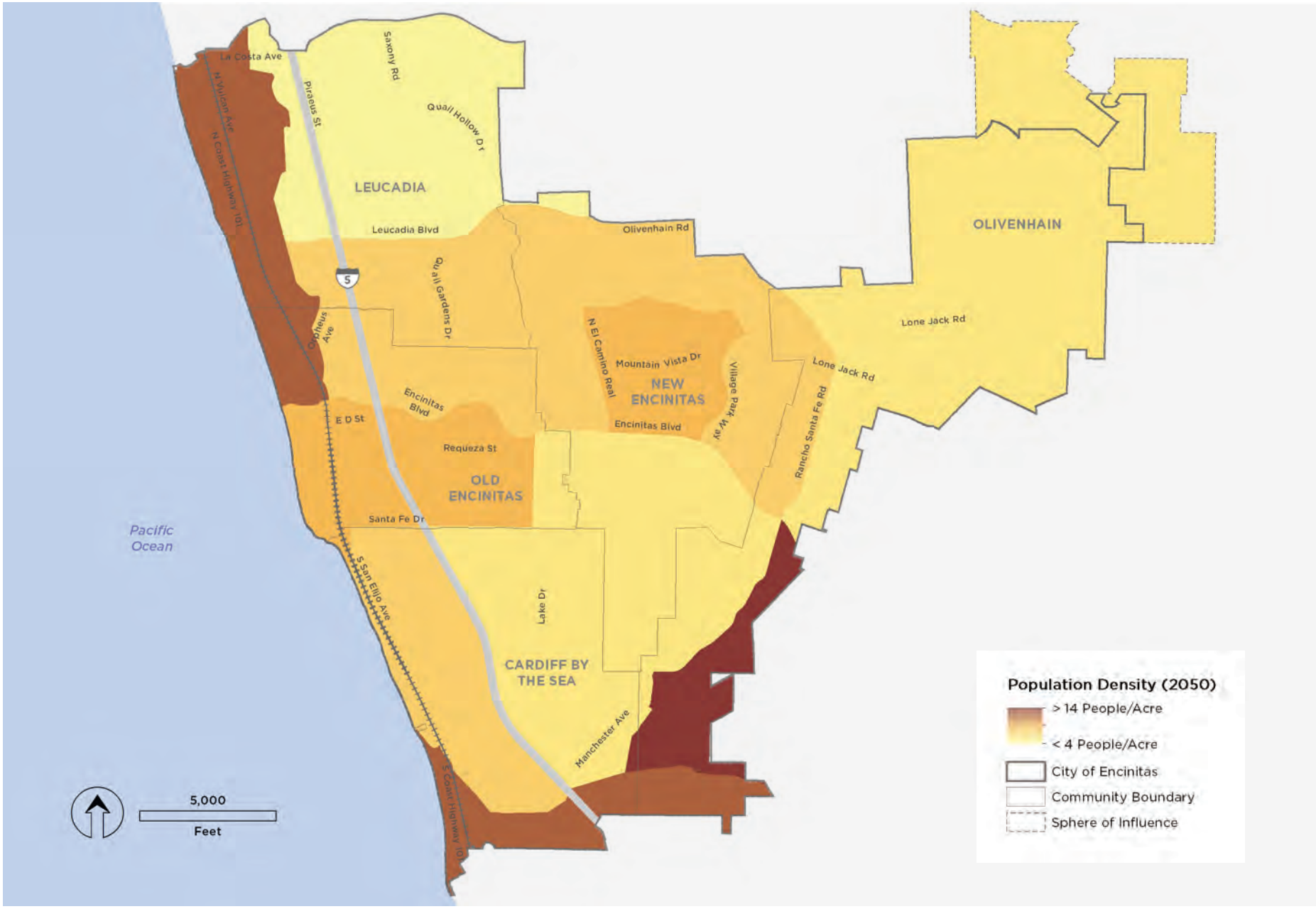
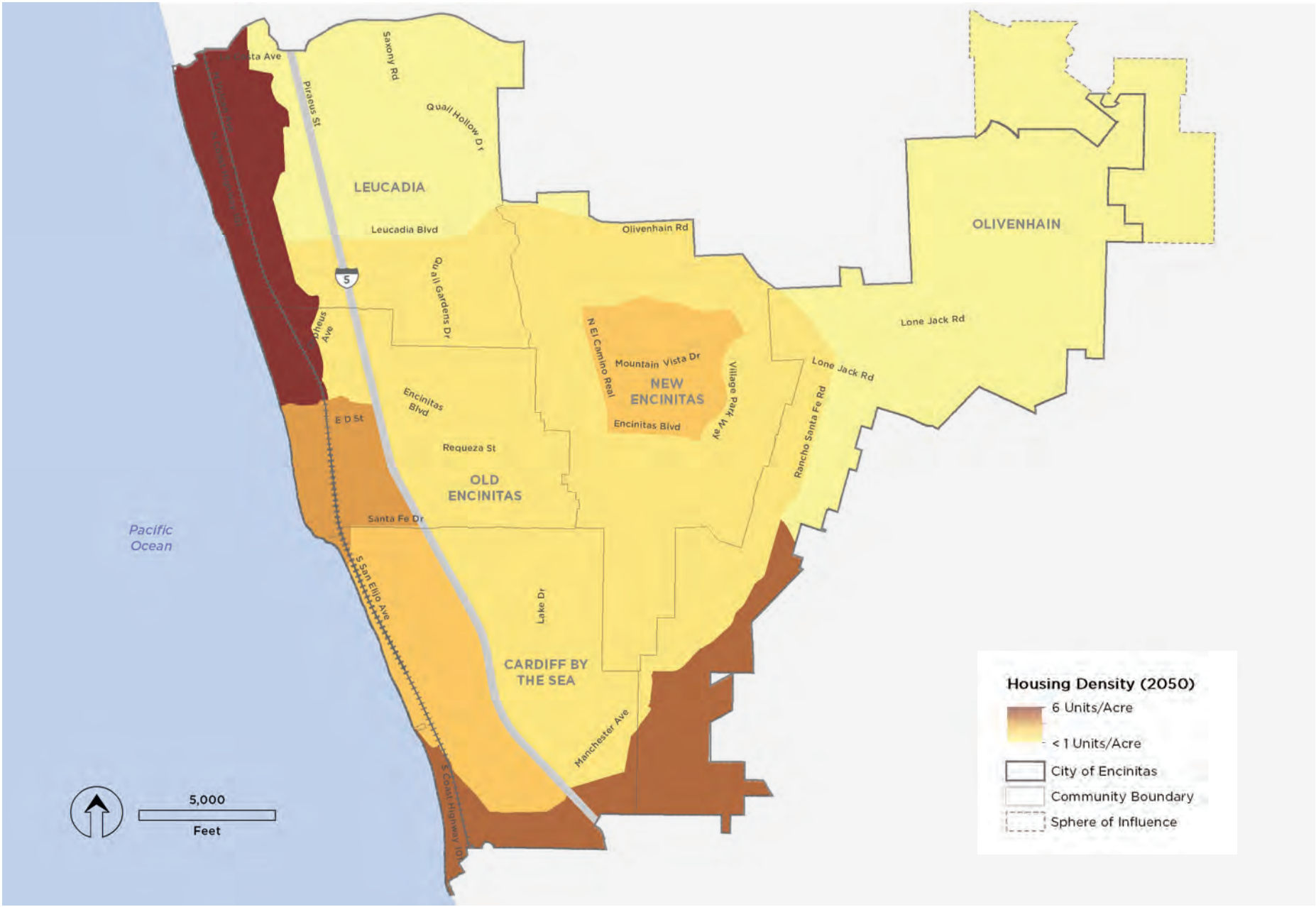


FIGURE 2-8: 2050 Housing Density



TRIP ORIGIN SUMMARY

Based on existing housing and population densities, most future bicycling and walking activity is likely to originate from within the residential areas. These areas are large enough in terms of population density and physical size to generate some bicycling and walking traffic that originates and terminates within themselves, as well as supplying users for the city-wide active transportation system. Demand for active transportation facilities can be expected to grow with increases in employment density, especially for amenities favored by commuters such as secure bicycle parking, bike lockers and showers at their destination points.

TRIP DESTINATIONS

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

SANDAG data lists activity centers as a community's major employers, office buildings, industrial sites, government sites, retail centers, hospitals, major attractions, colleges, universities, schools or parks and open space. The commercial and retail activity centers can also be regarded as employment centers because, in addition to the customers that constitute the typical activity center users, they also represent significant numbers of employees. Encinitas' major retail centers are represented in SANDAG's data within the highest employment density category. The civic activity centers include Encinitas' parks and schools. Figure 2-9: Destinations, shows Encinitas' key activity center destinations identified by City staff as follows:

Key Destinations

1. South Ponto Beach Parking Lot
2. Seabluff Village Access (Private)
3. Grandview Surf Beach Access
4. Leucadia Oaks Park
5. Hawk View Park
6. Beacon's Beach Access
7. Leucadia Roadside Park
8. Stonesteps Beach Access
9. Orpheus Park
10. Moonlight State Beach
11. D Street Viewpoint Park
12. Encinitas Viewpoint Park
13. Cottonwood Creek Park
14. Ecke Sports Park
15. Las Verdes Park
16. Leo Mullen Sports Park
17. Scott Valley Park
18. Sun Vista Park
19. Wiro Park
20. Mildred MacPherson Park
21. Swami's State Beach
22. Encinitas Community Park
23. Oakcrest Park
24. George Berkich Park
25. San Elijo State Beach
26. Glen Park
27. Cardiff State Beach
28. Cardiff Sports Park
29. Seaside State Beach

Existing employment density is highest within a cluster of employers, office buildings and industrial sites in the area immediately around downtown Encinitas' main thoroughfares. Employment density is just as high in other areas of Encinitas, particularly North El Camino Real where there are larger office buildings and major retail employers. Employment density is an indicator of bicycling and walking facility demand in general, but more specifically, it is an indicator for shopping trips to areas with numerous businesses versus commuting trips to areas with major employers.

Activity centers were evaluated to determine proximity to an existing or proposed active transportation facility to make the system as functional and attractive to current and potential bicyclists and pedestrians as possible.

FIGURE 2-9: Destinations

FIGURE 2-10: 2016 Employment Density

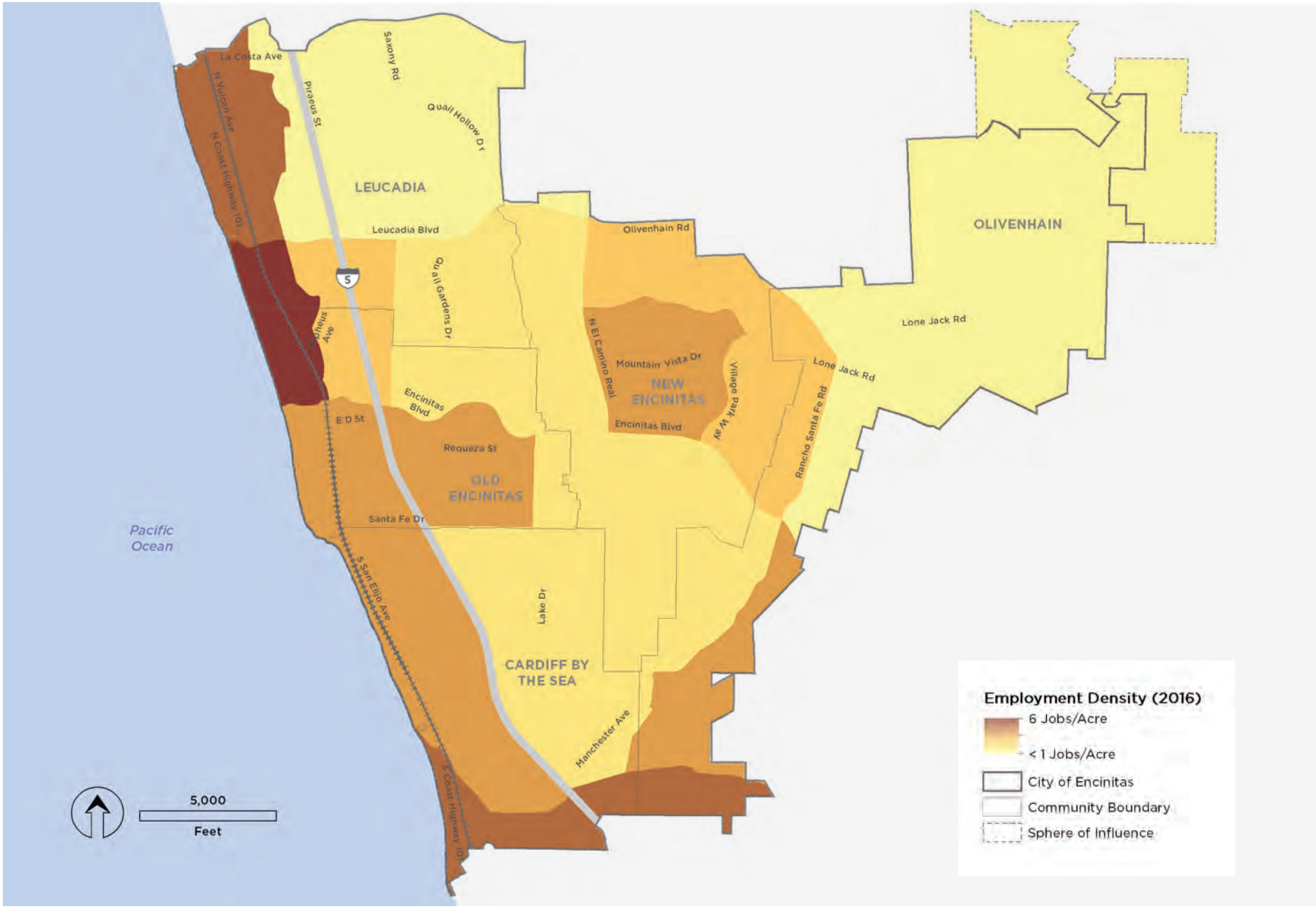
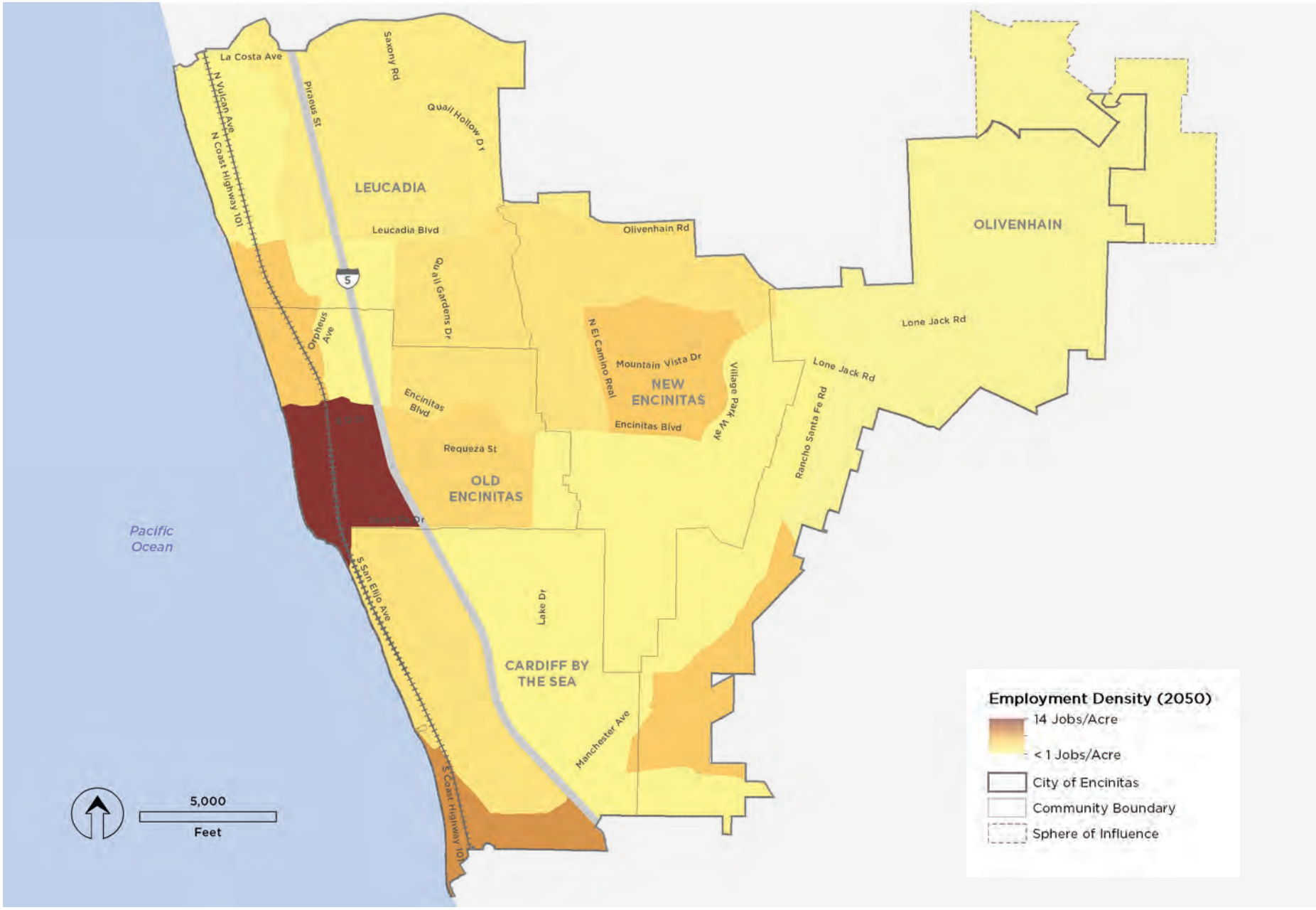


FIGURE 2-11: 2050 Employment Density



Parks/Schools/Civic Centers

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

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

TRIP DESTINATION SUMMARY

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

Most communities have characteristic special destinations. In Encinitas these special destinations include the scenic coast where bicycling and walking is easiest due to flat terrain, making them desirable destinations for residents and visitors. Typically, the coastal strip has higher levels of bicycle use than any other area, especially recreational cycling. Because of its attractiveness for walking and bicycling of all types, the coastal portion of Encinitas should be considered a destination in itself. In addition, Coast Highway 101 is a well-known route for competitive athletic training, especially for bicyclists and triathletes, and could also be considered a destination in itself.

MULTI-MODAL CONSIDERATIONS

Linking the walking and bicycling facilities with other transportation modes can enhance active transportation efficiency, especially for commuting cyclists who can ride to or from a multi-modal transfer point as part of their regular commute. Where transit modes allow bicycles on board, multi-modal transit becomes a very useful transportation option. While transit modes that allow bicycles on board are preferred, they all allow for greater flexibility for persons choosing to commute by modes other than driving.

Existing transfer points such as commuter rail stations and bus stops were reviewed in relation to active transportation facilities to determine how well transit systems serve the multi-modal travel. In general, local bus routes run on major thoroughfares that closely correspond with existing active transportation facilities, including allowing bicyclists to board at a preferred bus stop after putting their bicycle on the bus rack.

Routes appear to serve the areas of highest employment density, which are generally situated along the major arterials. All buses are equipped with two-bike racks, which serve multi-modal travel at the most fundamental level.

North County Transit District (NCTD)

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

Coaster Commuter Rail

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

NCTD Buses

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

Park and Ride Facilities

Park and ride lots in Encinitas are described below (see Figure 2-12: Transit Systems). Note that none are equipped with bicycle lockers.

Though not within city limits, Park and Ride Lot 32 is immediately north of Encinitas in Carlsbad, northeast of the intersection of La Costa Avenue and Interstate 5 with 108 parking spaces.

Park and Ride Lot 62 is located just south of Encinitas Boulevard on Calle Magdalena at the San Dieguito United Methodist Church with 27 parking spaces. According to SANDAG, nearby services include busses, shopping and fuel.

Park and Ride Lot 47 is located at the northeast corner of the intersection of Birmingham Drive and Interstate 5 with 49 parking spaces.

Additional parking is available at the Transit Center lot.

Transit Center

Encinitas has one transit center served by three local bus routes, Encinitas Station in downtown coastal Encinitas. It is also a stop for the Coaster commuter rail. These facilities are shown in Figure 2-12.

SAFETY

Safety is a primary concern in evaluating an existing active transportation facility system or in proposing new facilities or extensions. The primary lesson learned from the literature reviewed for this active transportation plan and others is that installation of active transportation facilities without careful consideration of their specific attributes and drawbacks can exacerbate already problematic safety situations. This is particularly true for facilities that are likely to be used by other user types like runners and skaters, in addition to bicyclists and pedestrians. Safety concerns vary depending on the facility type.

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

Collision Data Analysis

To help evaluate bicycling and walking conditions in Encinitas, the latest available five years of data were analyzed, from 2012 to 2016, for reported collisions involving bicyclists and pedestrians. For graphic clarity, a map was produced highlighting locations by parties involved, as well as the collision severity, Figure 2-13: Collisions (2012-2016).

FIGURE 2-12: Transit Systems

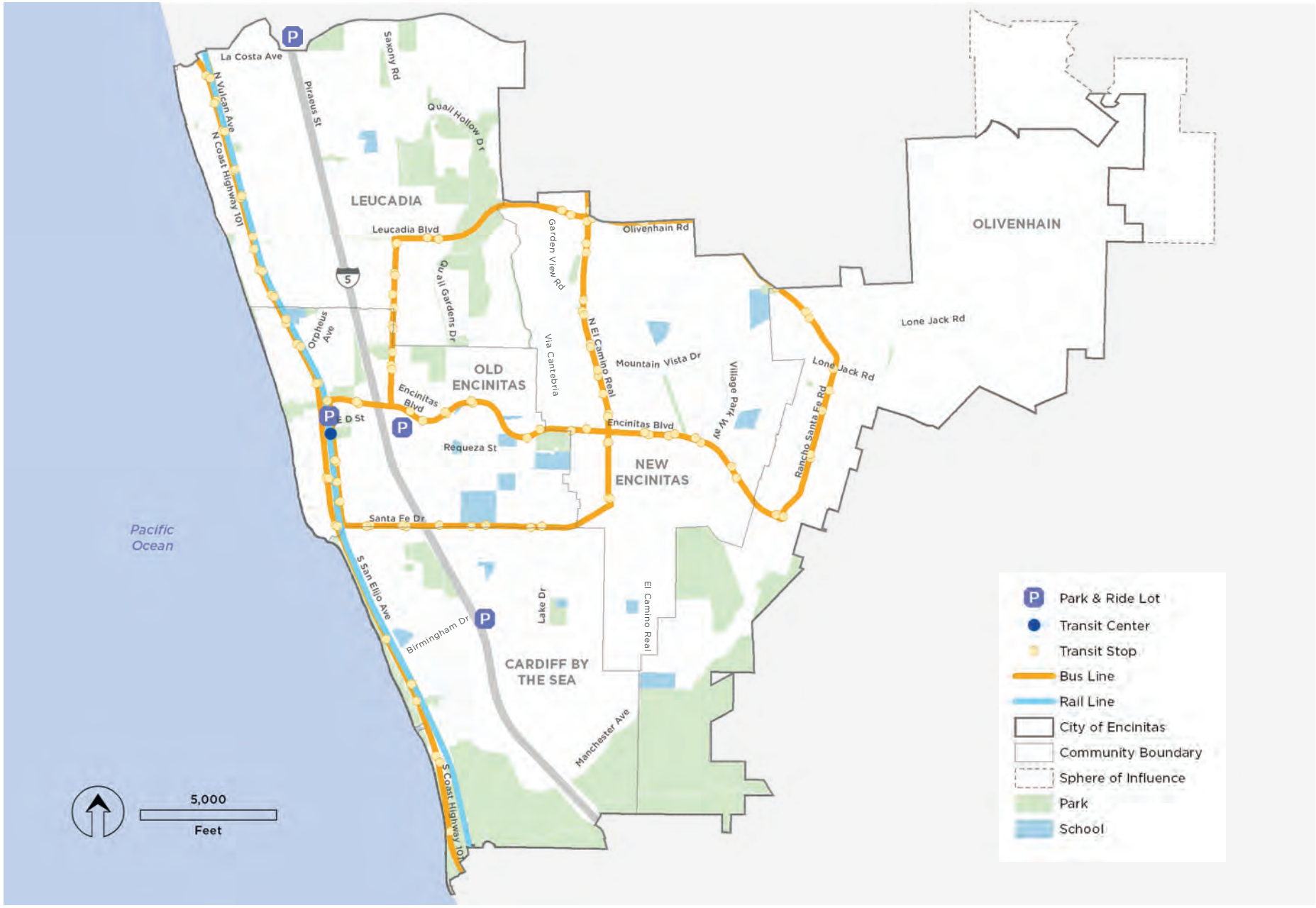
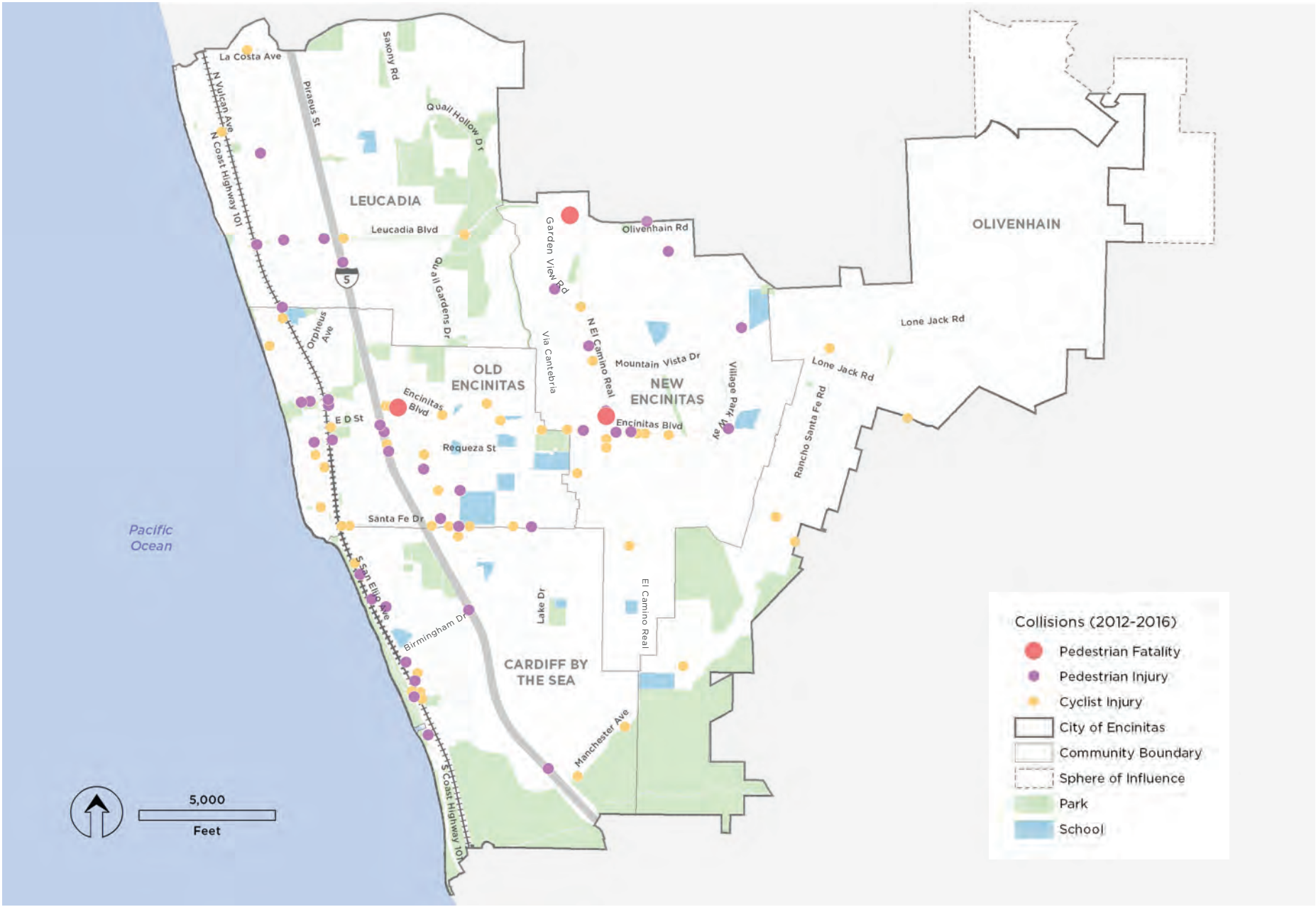


FIGURE 2-13: Collisions (2012-2016)



Though crashes have occurred in many locations over the last five years, there are concentrations primarily along the main arterials like Encinitas Boulevard, especially at or near intersections with other major roadways. Most of the crashes along Encinitas Boulevard occurred at or near Coast Highway 101, Interstate 5, and El Camino Real. Crashes were more scattered throughout the length of Coast Highway 101, but there were notable concentrations at the intersections of D Street and Chesterfield Drive. A high concentration of crashes also occurred at the intersection of El Camino Real and Encinitas Boulevard. Vehicle traffic volumes here rank among the highest in the City.

There is a secondary set of crash concentrations involving bicyclists and pedestrians at the Interstate 5 crossings, though the number of crashes is low compared to the other concentrations noted above. This is likely the result of conflicts with motor vehicle lane changing and turning movements as drivers exit and enter the freeway and bicyclists and pedestrians proceed straight, having to cross high-speed on- and off-ramps.

The remainder of crashes involving bicyclists and pedestrians appears to be scattered incidents throughout the City. They occur almost exclusively at intersections, such as the cluster of intersections in Cardiff, but their low numbers over five years do not point to any specific trends.

OPPORTUNITIES AND CONSTRAINTS

Most of the bikeways and walkways proposed in this active transportation plan have been proposed in other documents, such as in previous bikeway master plans and specific plans. Whenever possible, routes were proposed to take advantage of opportunities to make connections between bicycle and walking trip origin points and destination points in sections of the City that may not otherwise be accessible via a bikeway or walkway.

Opportunities

Future Street Additions with Bicycle Facilities

The City of Encinitas' longstanding policy of including Class II bicycle lanes on arterial streets has resulted in a fairly comprehensive network on such streets in much of the City. When road and bikeway facility development is complete as planned, it will provide a comprehensive network of Class II routes throughout the City. Many experienced cyclists prefer on-street facilities that will provide sufficient routes. However, less experienced bicyclists may find them intimidating due to adjacent vehicle volumes, proximity and speeds.

Trail System

A community's trails are relevant to active transportation planning, even if they are unpaved and are not intended to meet Caltrans bikeways standards. This is especially true wherever connections can be made that enhance intra-community connectivity by linking the systems because non-motorized systems can be regarded as complementary extensions of each other, both for pedestrians and for people riding bicycles with wider tires, which are increasingly common.

In many cities, potential connections between the trail system and on-street bikeways are limited by the low number of trails. However, in Encinitas many proposed trail alignments parallel paved roadways, including roadways with bikeways, making connections between the systems plentiful. Especially in the eastern half of Encinitas, besides pedestrians and joggers, bicyclists with the proper bicycle often have the choice of whether to ride on the unpaved trail or the adjacent paved street.

The bikeway and walkway systems were analyzed in relation to the trail system to ensure that connection opportunities were not being overlooked. For example, if a trail meets or crosses a roadway that did not have a bikeway facility but was within a reasonable distance of an existing or proposed bikeway facility, the bikeway could be extended to meet the trail, making

both non-motorized systems more functional and convenient. The trail system is extensive and connections with proposed bikeway and walkway systems are widely available.

Citywide Opportunities:

- 110 feet of railroad right-of-way with a potentially cooperative agency
- Small streets making it difficult for drivers to drive too fast
- Limited arterials that are difficult to use as a cyclist or cross as a pedestrian
- Advocacy groups making a difference and to be more safe and sustainable

Connectivity Constraints

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

Citywide Challenges:

- Steep bluffs preventing walking and biking on the beach
- Six miles of Coast Highway with limited controlled intersections (12)
- Six miles of rail line with an average of 110 feet wide with crossing points (8)
- A freeway with nearly six miles of a barrier with crossing points (8)
- Hills, lagoons, and canyons making many streets steep and not connected
- High percentage of streets missing walkways
- High percentage of streets with limited rights-of-way for expansion for bicycle facilities

Steep or Long Grades

Some portions of Encinitas where bikeway and walkway facilities already exist or are proposed have significant grades, either particularly long or steep. Hills are a reality of the southern California region and most commuting cyclists are probably not deterred by hilly terrain or have found alternate routes. Recreational or less experienced cyclists may opt to avoid areas of steep or long grades. An example of a long grade is Encinitas Boulevard west of El Camino Real. Though long, it is fairly gradual and most bicyclists and pedestrians probably do not find it objectionable.

While coastal Encinitas is relatively level, the south coastal area of Cardiff lies on a ridge line facing the ocean. Especially in the east-west direction, many bicyclists and pedestrians will find the grade too strenuous for routine use. For example, Liverpool Drive is a steep street within Cardiff proposed in the 1990 Bikeway Master Plan as a Class III route because, due to local topography, there are no alternative routes nearby that would not also be as steep. This route approaches 20 percent in grade, making it likely that only the most fit bicyclists or pedestrians will use it. Figure 2-14: Slope illustrates topographic conditions across Encinitas.

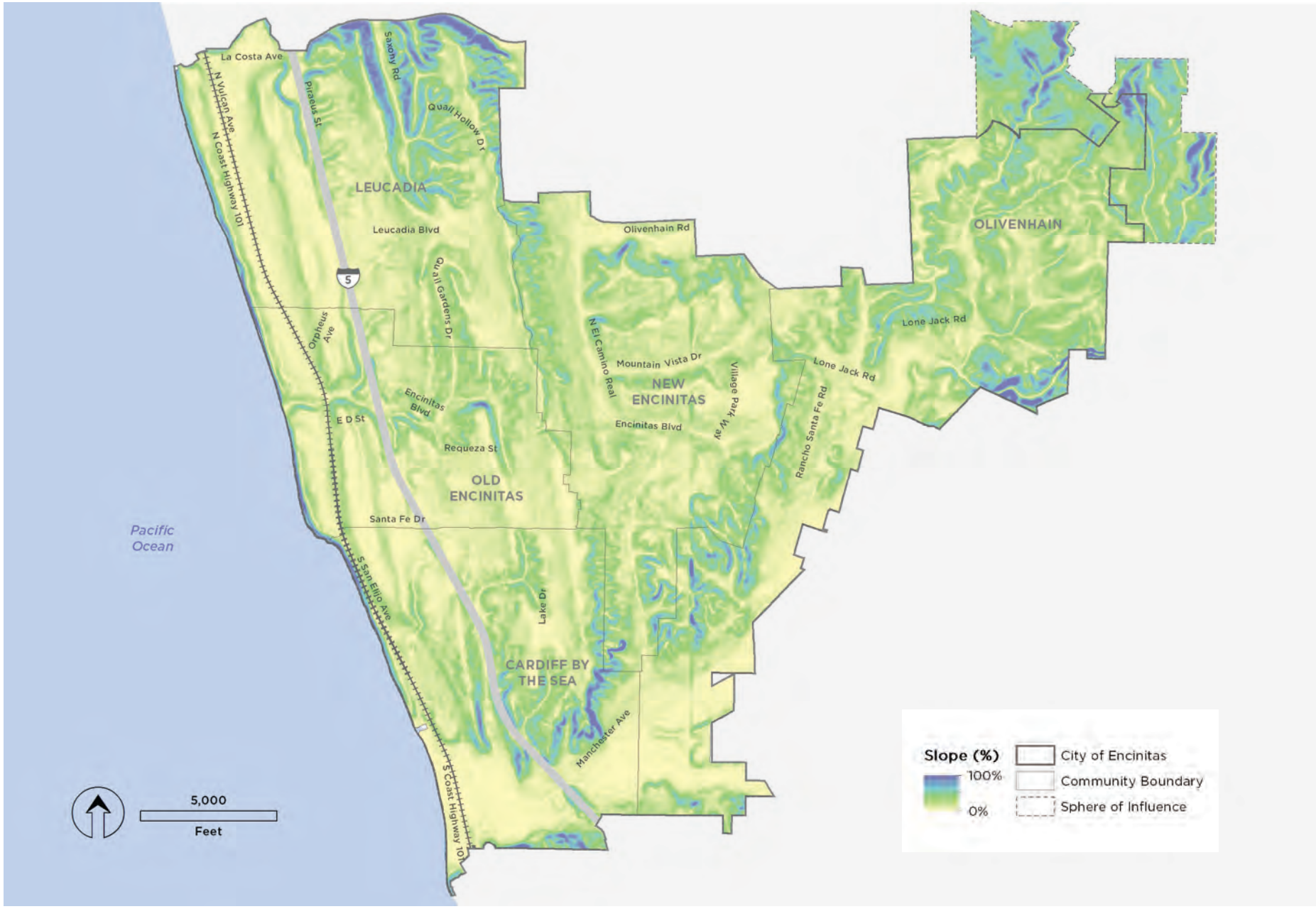
Interstate Highway/Coastal Rail Line

Interstate 5 and the coastal rail line through Encinitas are physical barriers to east/west connections. Community input pointed out the need to connect or upgrade several routes to improve connectivity. These included routes such as Coast Highway 101, Vulcan Avenue, Rancho Santa Fe Road and El Camino del Norte. Other comments requested similar improvements on roadways crossing Interstate 5 because several have bikeway facility gaps coinciding with the freeway right-of-way.

The existing roadway crossings under and over Interstate 5 are generally major arterials. Bicyclists and pedestrians must cross high volume on-ramps lanes entering the freeway and then cross motor vehicle traffic again as it exits the freeway via high speed merge lanes. Traversing typical freeway interchanges when crossing under or over the freeway can be a daunting experience as the bicyclist or walker is forced to deal with a lack of separated facilities, as well as drivers making lane changes onto multiple on- and off-ramps at speeds considerably higher than even a bicyclist's normal speed.

Similarly, crossing points across the coastal rail line are limited, which forces bicyclists and pedestrians who do not want to cross the tracks illegally to go out of their desired way to access the few legal crossings available.

FIGURE 2-14: Slope



Narrow Roadways

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

High Posted Speed Limits

Like roadway width, high posted speed limits alone may not be a deterrent to designating a bikeway facility on a roadway. For example, many of the facilities in central Encinitas east of Interstate 5 are on roadways with posted speed limits of up to 50 mph (See Figure 2-15: Posted Speeds). However, many less experienced bicyclists will feel uncomfortable using these major roadways, even with striped Class II lanes, and many pedestrians will also not want to walk adjacent to such high speed traffic.

Roadway Capacity

Two factors that greatly impact bicycling and walking along corridors are the vehicle volumes, or Average Daily Traffic (ADT), and Functional Class. Together these two attributes dictate roadway capacity, and therefore how comfortable the segment is for active transportation. A number of high volume, high capacity roadways crisscross Encinitas, making it uncomfortable for those traveling by bicycle and on foot. While walkers are generally more tolerant of high speed traffic than bicyclists, most pedestrians prefer walking along quieter roadways. Figure 2-16 and Figure 2-17 illustrate the roadway classes and the relative number of lanes.

San Elijo Avenue

Speed Limit Sign on Coast Highway 101

FIGURE 2-15: Posted Speeds

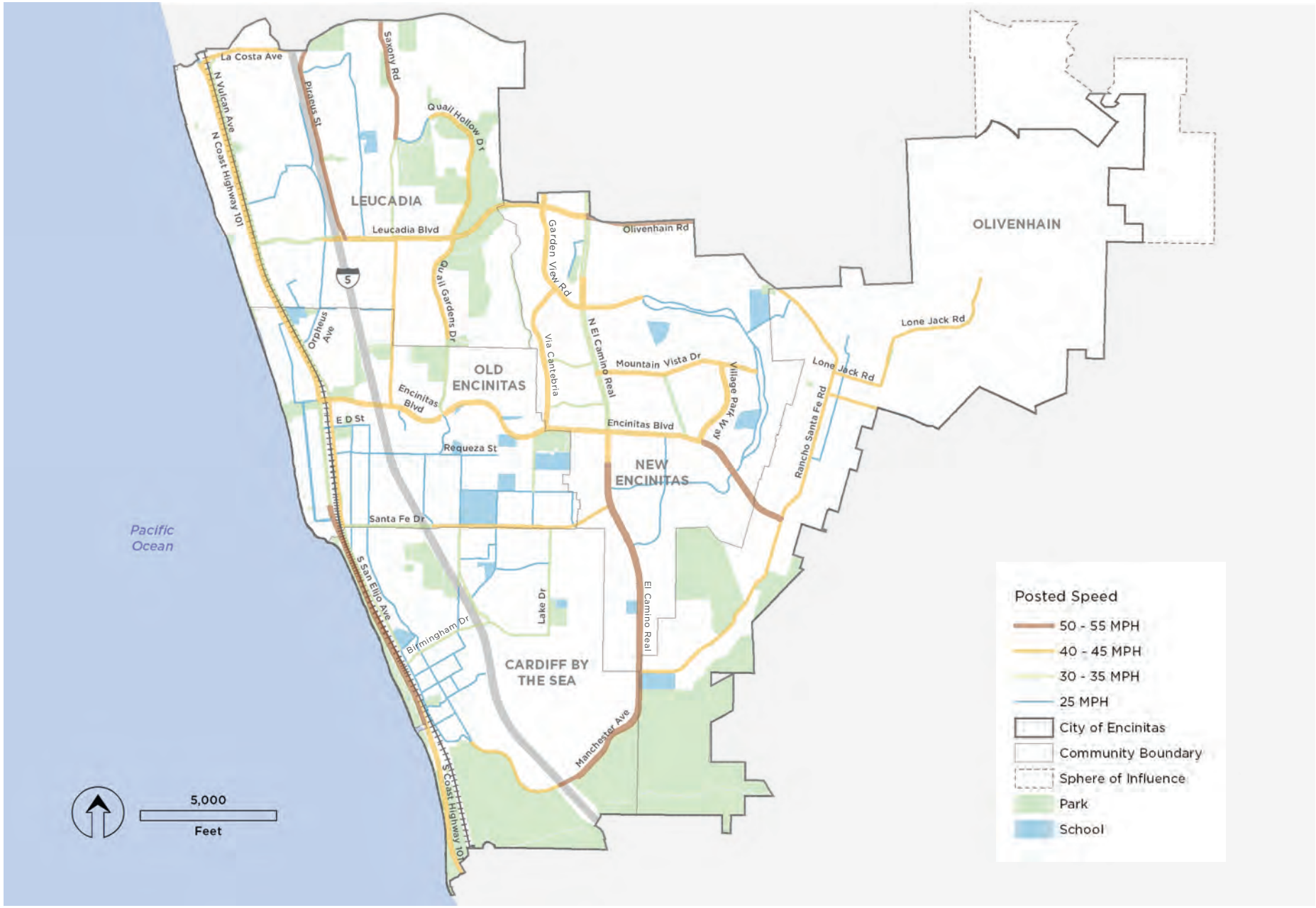


FIGURE 2-16: Roadway Classification

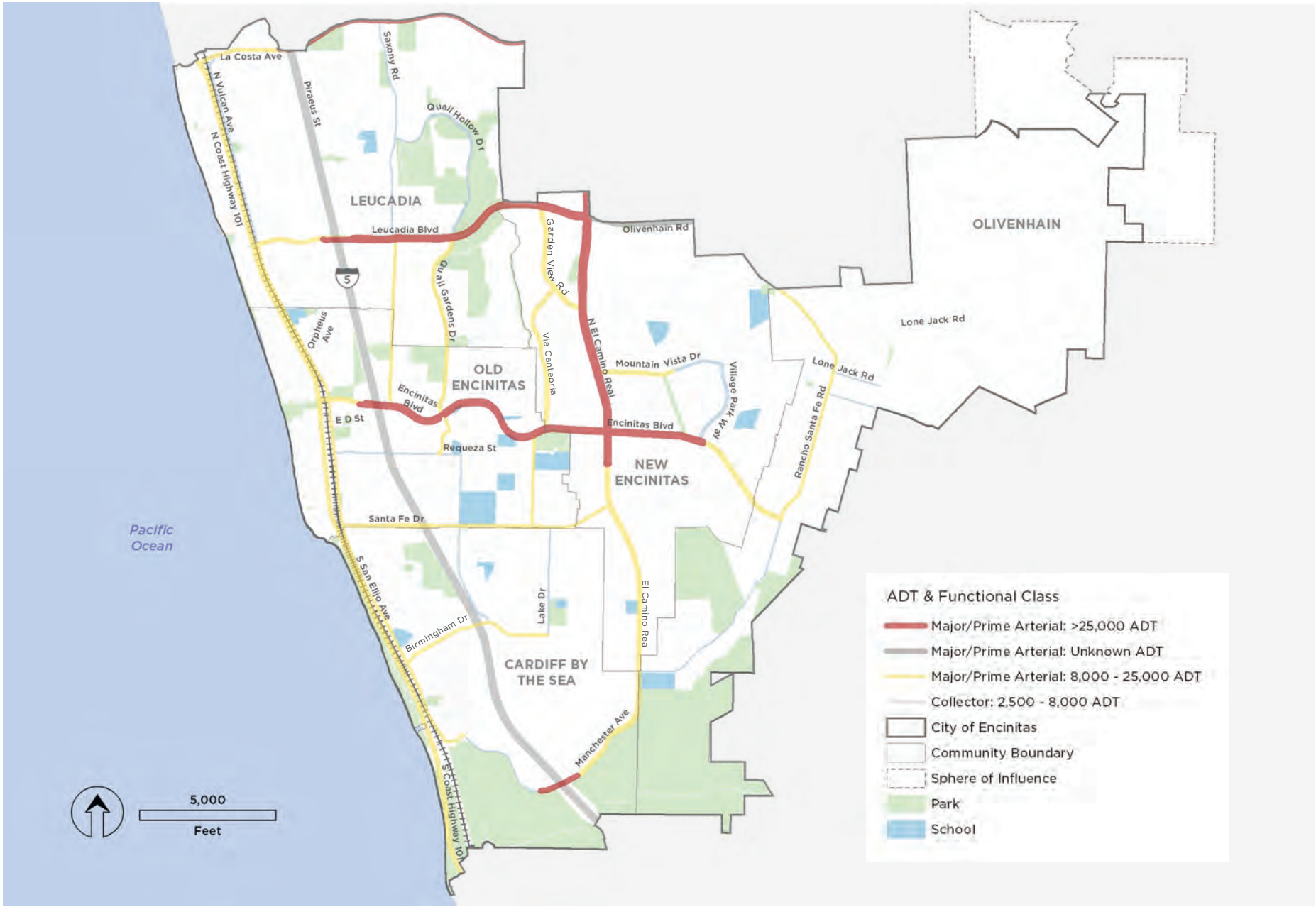
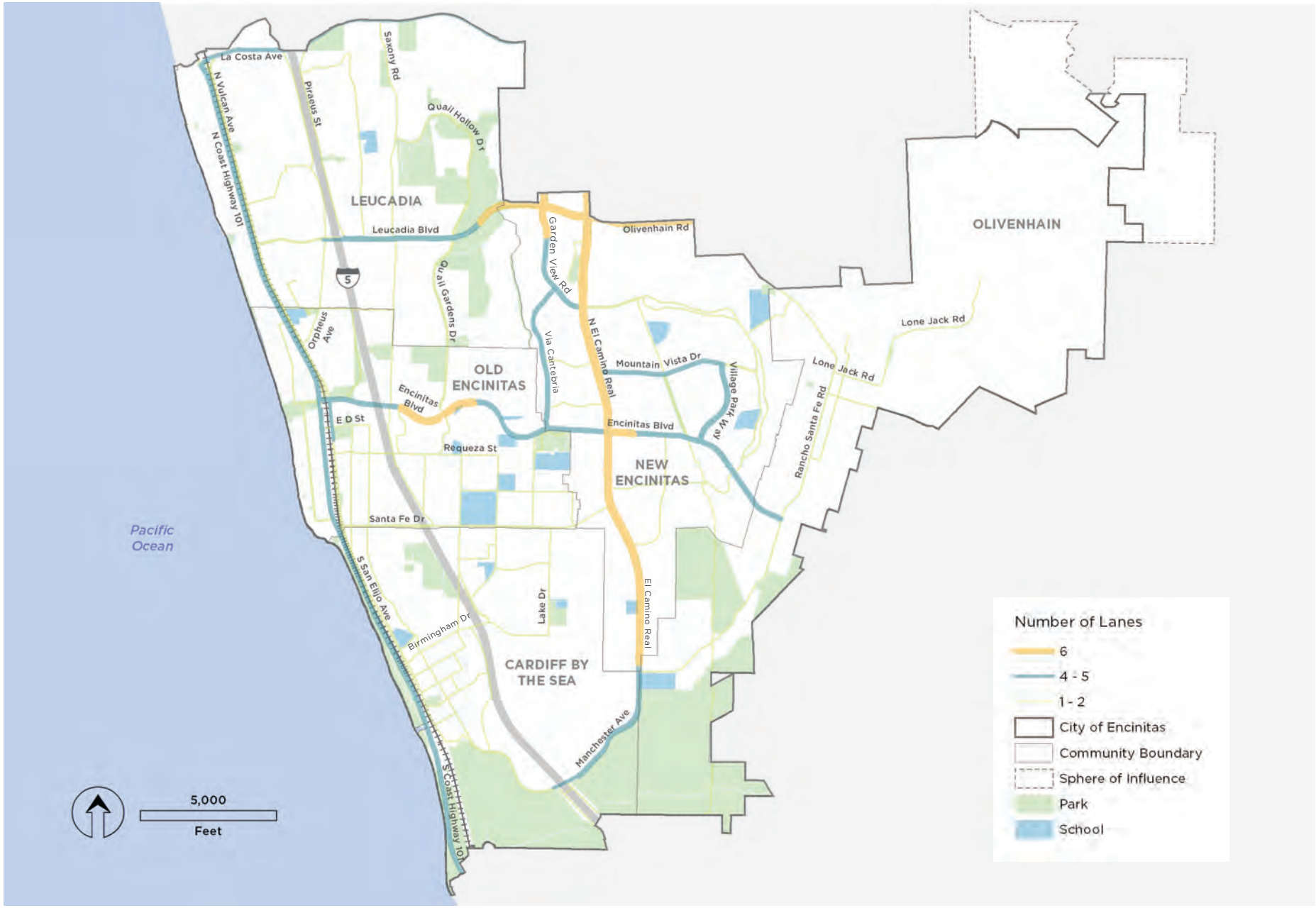


FIGURE 2-17: Number of Lanes



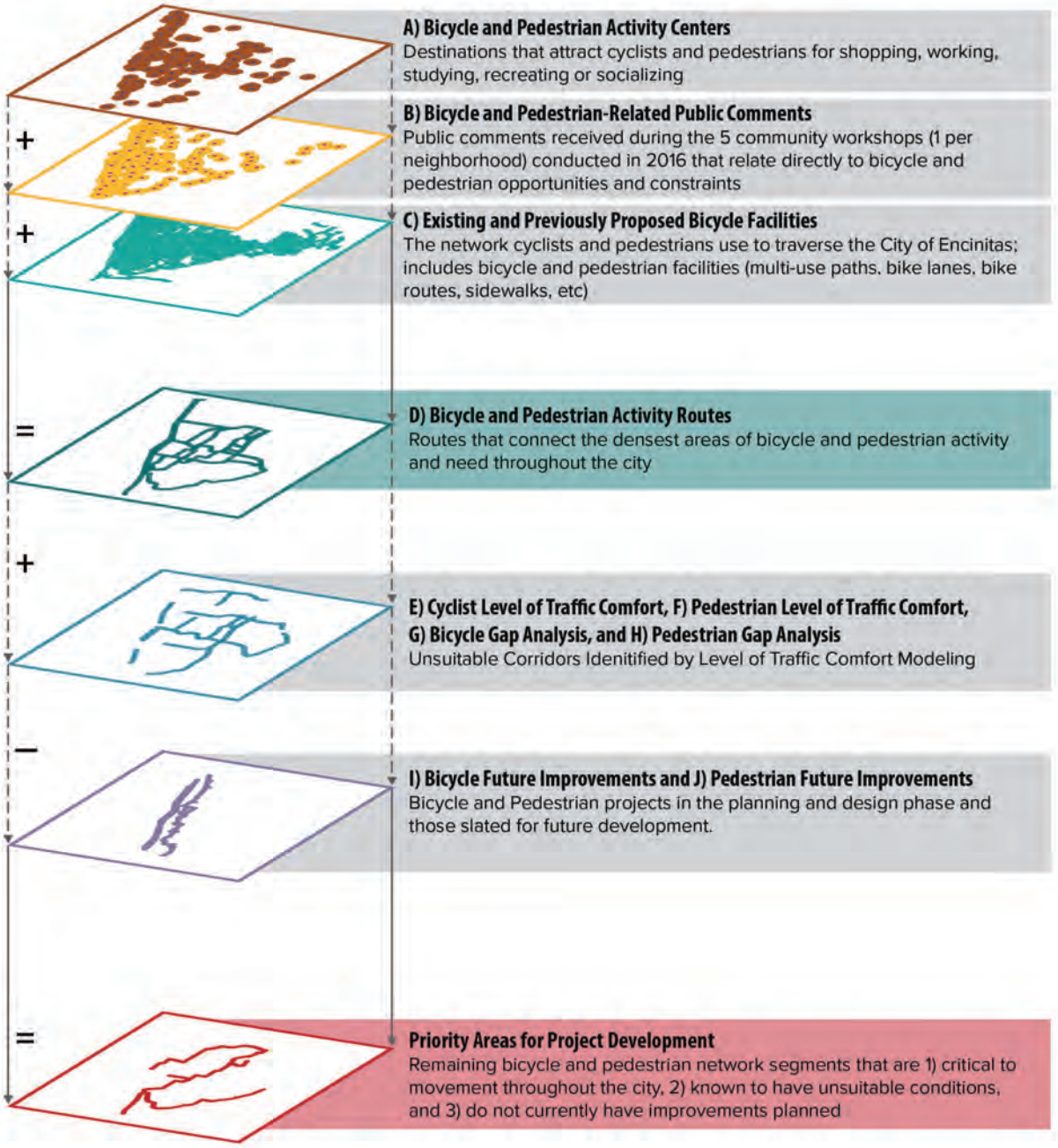
ANALYSIS MAPPING RESULTS

In general, urban pedestrian travel has been accommodated with features like sidewalks, crosswalks, dedicated signals, curb extensions, as well as newer innovations like pedestrian scrambles and modified signal timing. However, providing for safer, less stressful bicycle travel has occurred much more recently. Especially over the past five years, the state of practice for bicycle travel in the United States has undergone a significant transformation. Much of this may be attributed to bicycling's changing role in the overall transportation system. No longer viewed as an "alternative" mode, it is increasingly considered as legitimate transportation that should be actively promoted as a means of achieving community environmental, social and economic goals.

While connectivity and convenience remain essential bicycle travel quality indicators, recent research indicates the increased acceptance and practice of daily bicycling will require "low-stress" bicycle routes, which are typically understood to be those that provide bicyclists with separation from high volume and high speed vehicular traffic. The route types recommended by this plan, and described in the following section, are consistent with this evolving state of practice.

Project analyses were designed and performed in support of strong community interest in better, more comfortable bicycling and walking accommodations. The following descriptions describe the reasoning, process and inputs that resulted in the maps shown on the following pages.

FIGURE 2-18: GIS Analysis Process



Pedestrian Level of Comfort (PLOC)

To help identify ideal corridors for pedestrian improvements, an existing Pedestrian Level of Comfort analysis was performed. Analysis inputs included sidewalk presence, roadway speed, number of lanes, presence of bicycle lanes, presence of parking, and presence of a planting buffer for each roadway segment throughout the city. Intersections were classified by their crossing type (signalized, marked, unmarked), as well as the number of lanes and speed of the intersecting roadways. This analysis approach was developed by KTUA based on the Mineta Transportation Institute's 2012 Bicycle Level of Traffic Stress publication. The scoring matrix used to classify each segment and intersection is displayed below in the corresponding tables, and the resulting map in Figure 2-19. The resulting categories are defined as follows:

- PLOC 1- Suitable for almost all pedestrians, including children trained to safely cross intersections
- PLOC 2 - Suitable for most adult pedestrians but demanding more attention than might be expected from children
- PLOC 3 - Suitable for most older children with little or no parental supervision
- PLOC 4 - Mostly suitable for adults and children with parental supervision

TABLE 2-1: Missing Sidewalks

Speed Limit	Number of Lanes			
	2	3 (2+1)	4-5 (4+1)	6+
< 25	2	2	3	4
30	2	3	4	4
> 35	4	4	4	4

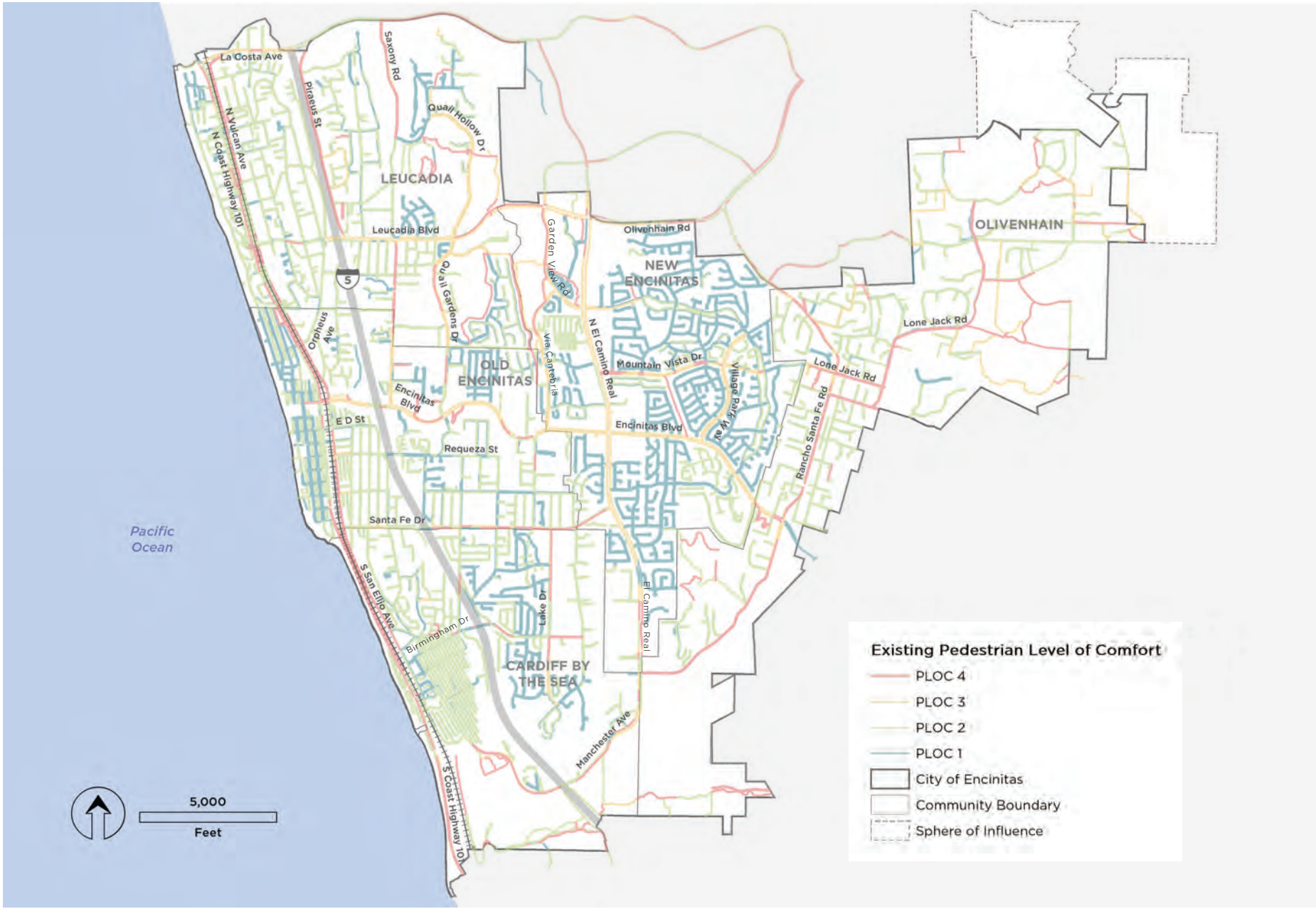
TABLE 2-2: Sidewalks Without Road Separation

Speed Limit	Number of Lanes		
	2	3	4+
< 25	1	1	2
30	1	2	2
35	2	3	3
> 40	3	3	4

TABLE 2-3: Sidewalks With One Separation (On-street Parking, Bicycle Lanes, or Planting Buffer)

Speed Limit	Number of Lanes	
	2	3+
< 25	1	2
30	1	2
35	2	3
> 40	3	3

FIGURE 2-19: Pedestrian Level of Comfort



Bicycle Level of Comfort (BLOC)

To help identify ideal corridors for bicycle improvements, an existing Bicycle Level of Comfort analysis was performed. The inputs for this analysis included roadway speed, number of lanes, and presence of bicycle lanes for each roadway segment throughout Encinitas. This analysis approach was originally developed by the Mineta Transportation Institute in 2012 and has since been modified by KTUA to apply to a variety of municipalities. The scoring matrix used to classify each segment is displayed below in the following tables, and the resulting map in Figure 2-21. The resulting categories are defined as follows:

- BLOC 1 - Suitable for almost all cyclists, including children trained to safely cross intersections
- BLOC 2 - Suitable to most adult cyclists but demanding more attention than might be expected from children
- BLOC 3 - Suitable to many people currently riding bikes in American cities
- BLOC 4 - Suitable to very few people, the "strong and fearless" cyclists who will ride in nearly any setting

Once Level of Traffic Comfort results had been obtained, they were used to identify network barriers to pedestrian travel. Figure 2-20 displays the major pedestrian activity routes, or routes that connect the densest areas of activity and need throughout Encinitas. Results from the Level of Traffic Comfort analysis are overlaid to highlight gaps in the pedestrian network and ultimately areas to be focused upon in the recommendations phase of this Active Transportation Plan.

TABLE 2-4: Sidewalks With Multiple Separations (On-street Parking, Bicycle Lanes, or Planting Buffer)

Speed Limit	Number of Lanes	
	2	3+
< 25	1	2
30	1	2
35	2	3
> 40	3	3

TABLE 2-5: Unmarked Crossing

Speed Limit	Number of Lanes			
	2	3 (2+1)	4-5 (4+1)	6+
< 25	2	2	3	4
30	2	3	4	4
> 35	4	4	4	4

TABLE 2-6: Marked Crossing

Speed Limit	Number of Lanes			
	2	3 (2+1)	4-5 (4+1)	6+
< 25	1	1	2	3
30	1	2	3	4
> 35	3	3	4	4

TABLE 2-7: Signalized Crossing

Speed Limit	Number of Lanes			
	2	3 (2+1)	4-5 (4+1)	6+
< 25	1	1	1	2
30	1	1	2	3
> 35	2	2	3	3

TABLE 2-8: Multi-use Paths (Class I)

1

TABLE 2-9: Bike Lanes (Class II Buffered)

ADT	Speed	Lanes		
		2 - 3	4 - 5	6+
2,500 - 8,000 or Designated Local/Local	<= 25	1	1	1
	30 - 35	1	1	2
	40 -45	2	2	3
	> 45	2	3	3
8,000 - 25,000 or Collector	<= 25	1	2	2
	30 - 35	2	2	3
	40 -45	3	3	4
	> 45	3	4	4
> 25,000 or Prime/Major Arterial	<= 25	3	3	3
	30 - 35	3	3	4
	40 -45	3	4	4
	> 45	4	4	4

TABLE 2-10: Bike Lanes (Class II w/o Buffer)

ADT	Speed	Lanes		
		2 - 3	4 - 5	6+
2,500 - 8,000 or Designated Local/Local	<= 25	1	1	2
	30 - 35	2	2	3
	40 -45	3	3	4
	> 45	4	4	4
8,000 - 25,000 or Collector	<= 25	2	2	3
	30 - 35	3	3	4
	40 -45	4	4	4
	> 45	4	4	4
> 25,000 or Prime/Major Arterial	<= 25	4	4	4
	30 - 35	4	4	4
	40 -45	4	4	4
	> 45	4	4	4

TABLE 2-11: Shared Roadways

ADT	Speed	Lanes		
		2 - 3	4 - 5	6+
2,500 - 8,000 or Designated Local/Local	<= 25	1	2	3
	30 - 35	2	3	4
	40 -45	3	4	4
	> 45	4	4	4
8,000 - 25,000 or Collector	<= 25	2	3	4
	30 - 35	3	4	4
	40 -45	4	4	4
	> 45	4	4	4
> 25,000 or Prime/Major Arterial	<= 25	4	4	4
	30 - 35	4	4	4
	40 -45	4	4	4
	> 45	4	4	4

FIGURE 2-20: Barriers to Pedestrian Travel

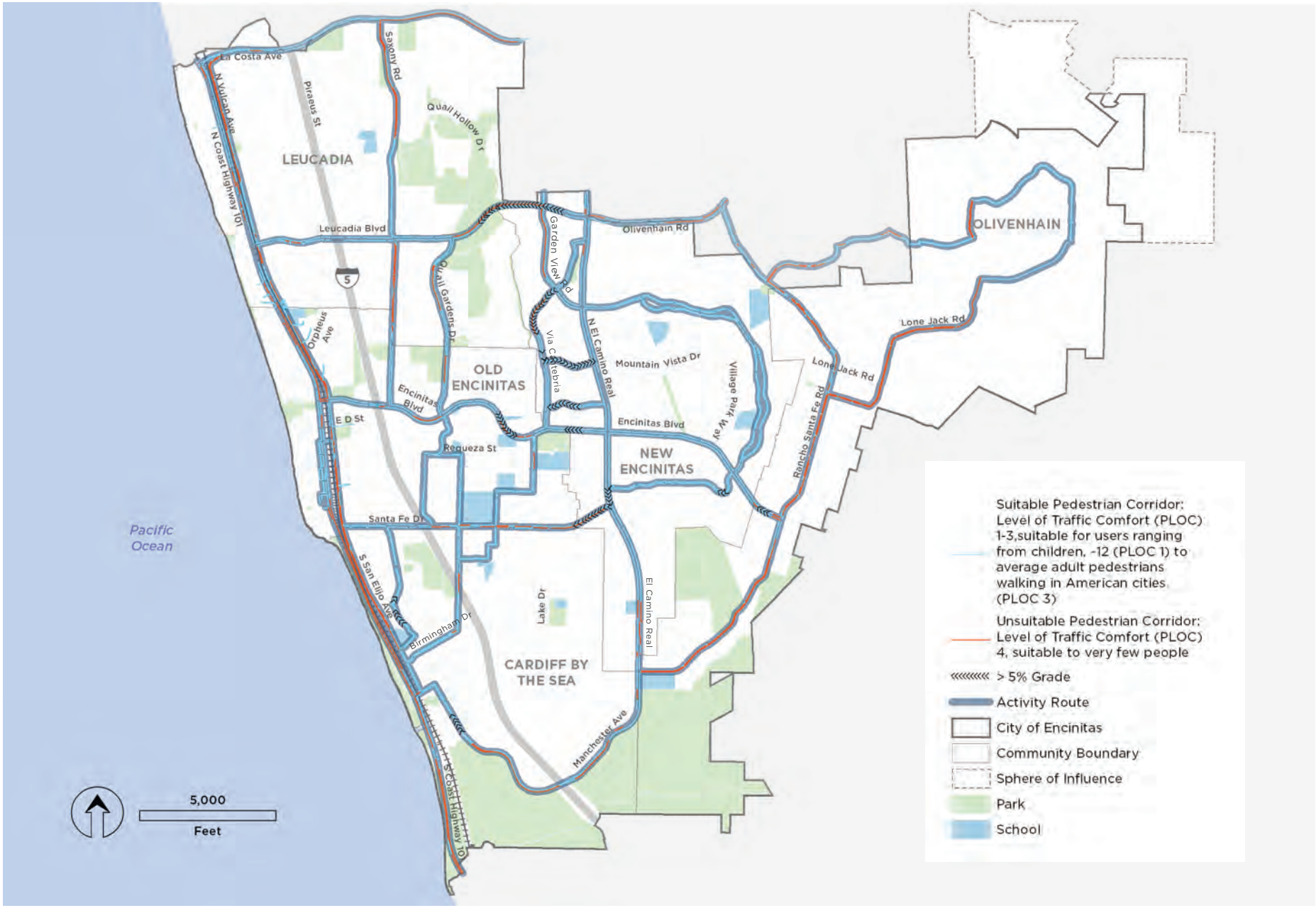
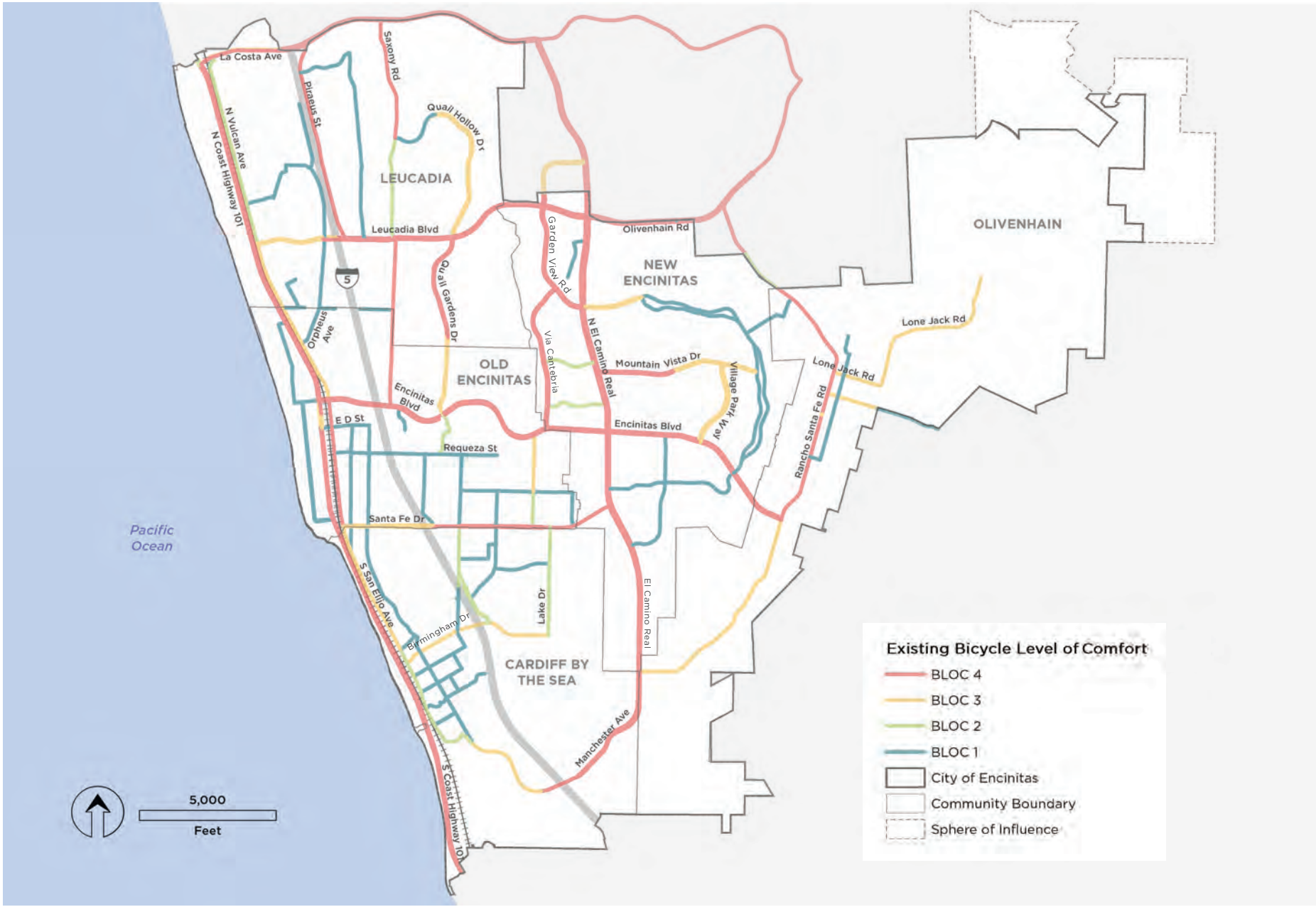


FIGURE 2-21: Bicycle Level of Comfort



Barriers to Bicyclist Travel

Figure 2-22 displays the major bicycle activity routes, or routes that connect the densest areas of activity and need throughout the City. Results from the Level of Traffic Comfort analysis are overlaid to highlight gaps in the bicycle network and ultimately the areas upon which to focus during the recommendations phase of this Active Transportation Plan.

Finally, Figure 2-23 is a compilation of barriers to both pedestrian and bicycle travel, such as the rail line and freeway, as well as the extent of dead end streets throughout Encinitas.

Barriers to Pedestrian and Bicycle Travel

FIGURE 2-22: Barriers to Bicyclist Travel

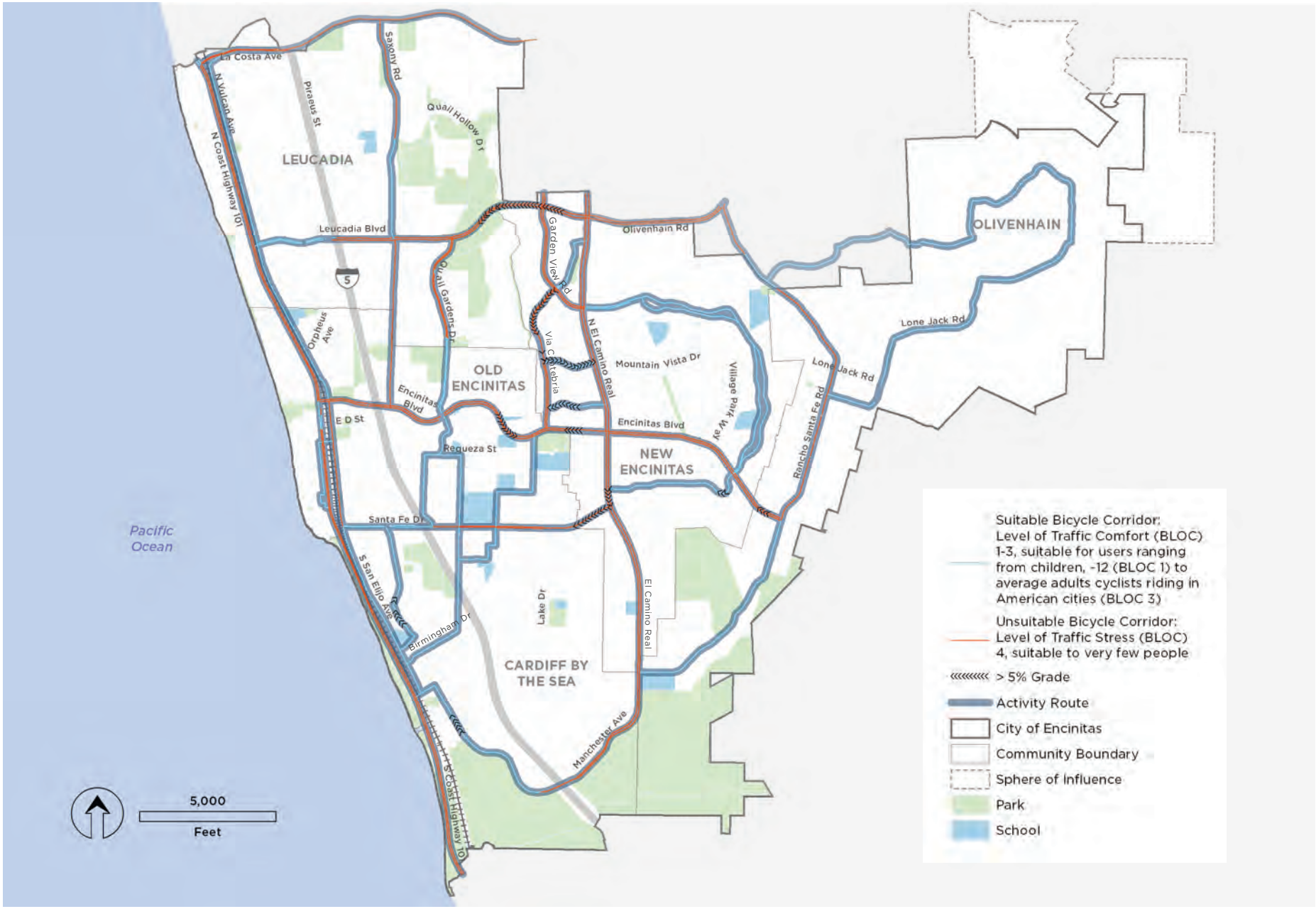
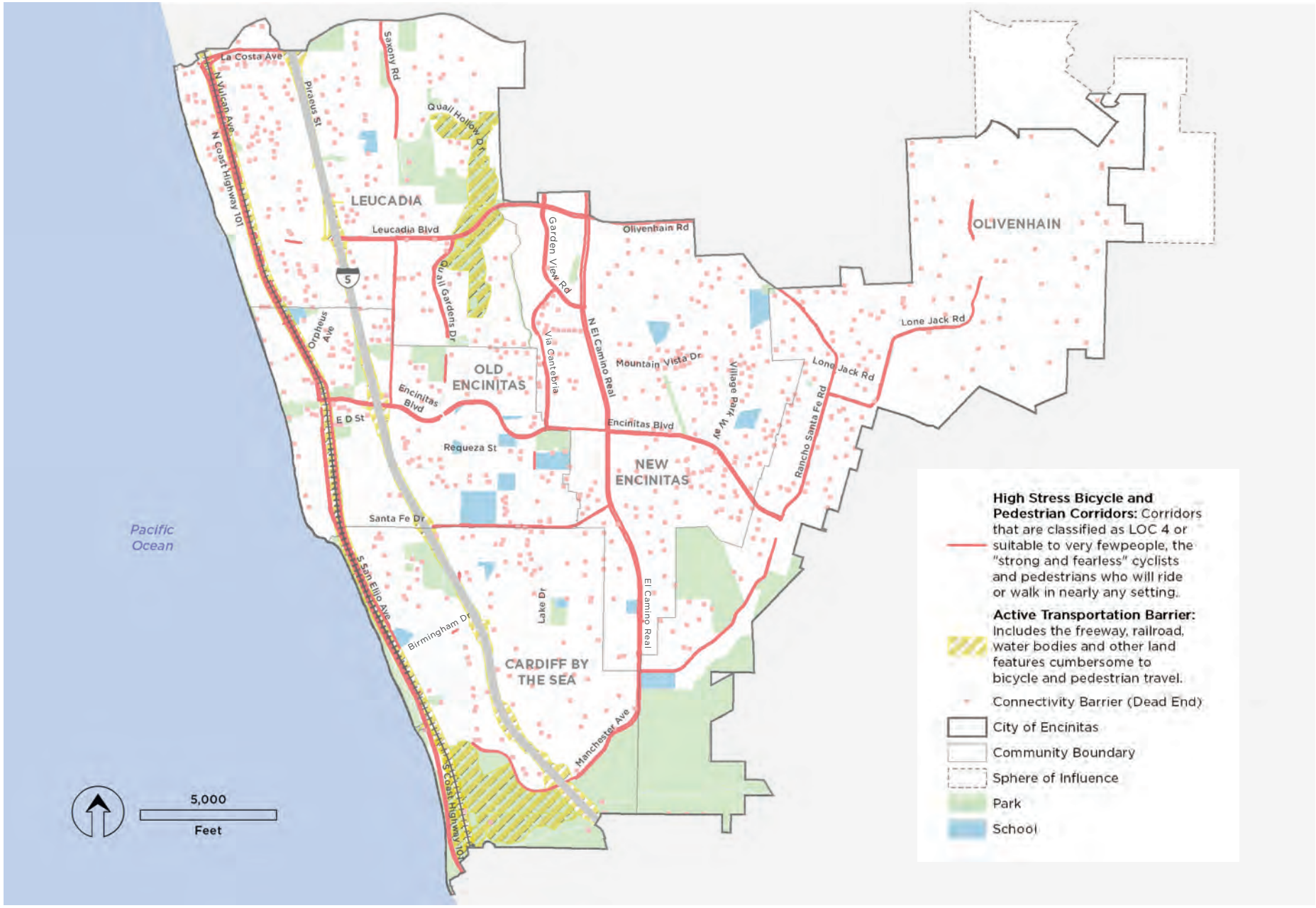


FIGURE 2-23: Barriers to Pedestrian and Bicyclist Travel



COMMUNITY INPUT

This Active Transportation Plan was coupled with other mobility planning efforts underway in Encinitas to take advantage of shared outreach opportunities. This included community meetings addressing the RCVS and CLMS noted earlier, as well as meeting with the advocacy group Bike Walk Encinitas. Figure 1-2: Public Comments by Topic on page 5, shows public input by location received during the five community workshops (one per neighborhood, as well as nine other site-specific input events) conducted in 2016 that relate directly to bicycle and pedestrian opportunities and constraints. In addition to activity centers, these comments were used to identify key corridors for bicycle and pedestrian improvements, as well as to identify specific locations in need of improvement.

The City's web site includes a project timeline page listing City Council meetings and presentations, CMLS Working Group meetings, public open houses, and other associated events: https://tinyurl.com/y8vzfp7r.

Community Workshop

CHAPTER 3
RECOMMENDATIONS

Based on the previous chapters of this active transportation plan, this chapter describes bikeway and walkway system improvements recommended for the City of Encinitas. The following recommendations are intended to build on the opportunities presented by existing and programmed roadways and improved bicycling and walking facilities to resolve users concerns for safety and connectivity.

The existing bikeway system mapping was derived from SANDAG's regional bikeway GIS data, previous mobility planning efforts, review of specific plans, community input, and extensive field analysis (see Figure 2-2: Existing Bicycle Facilities). Encinitas has no Class I facilities, but does have a fairly comprehensive system of Class II bicycle lanes along its major roadways in the eastern portion of the City. There are three existing Class III bicycle routes, the single longest route being on Coast Highway 101 north of Encinitas Boulevard. Like most cities, there are gaps in the bikeway system. Potentially important gaps include Manchester Avenue between Interstate 5 and San Elijo Avenue, and segments of Santa Fe Drive between El Camino Real and San Elijo Avenue.

Existing pedestrian system mapping was derived from SANDAG's regional walkway GIS data, previous mobility planning, review of specific plans, field analysis, and community input (see Figure 2-1: Existing Pedestrian Facilities).

PROPOSED BICYCLE FACILITIES

The recommended segment numbers in the Bicycle Projects Table are referenced throughout the following sections. The facilities shown in Figure 3-1: Proposed Bicycle Facilities, represent all proposed bikeway types. The following sections describe the proposed bicycle facilities in more detail with maps for each facility type.

Bicycling is popular in Encinitas, especially for riders with experience in traffic. The intent of this plan is to provide facilities that all riders can feel comfortable using.

FIGURE 3-1: Proposed Bicycle Facilities

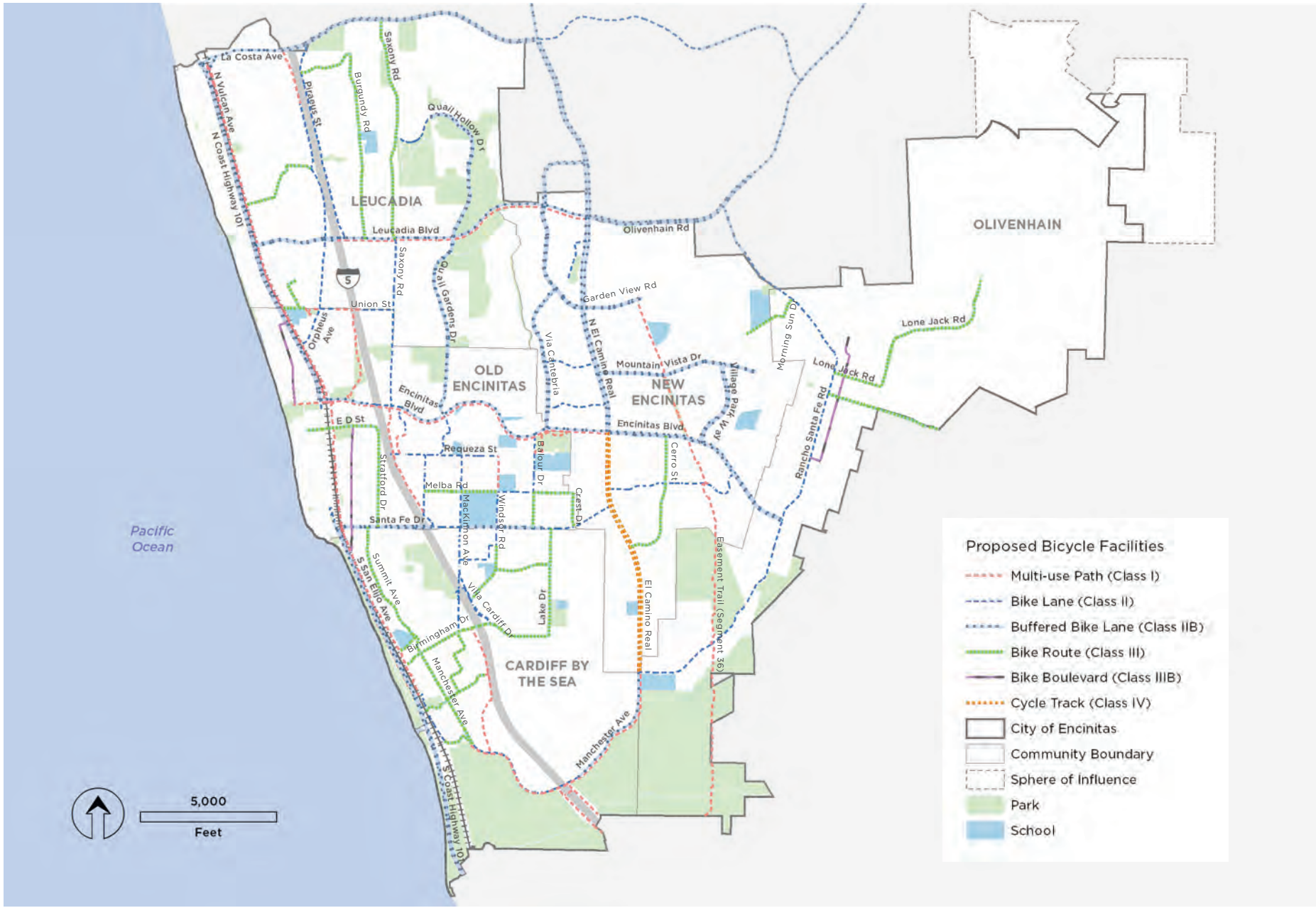


TABLE 3-1: Bicycle Projects

Segment ID	Street Name	Facility Type	Miles	From	To	Notes
1	Coast Highway 101	IIB	5.0	La Costa Ave	Encinitas Blvd	Includes Leucadia Streetscape Improvements
		II	0.1	Encinitas Blvd	Existing Bicycle Lane	
2	Class I	I	5.0*	La Costa Ave	Encinitas Blvd	La Costa Ave to Encinitas Blvd segment requires decision on east vs. west installation. *Mileage includes both options.
3	El Portal St	IIIB	0.1	Coast Highway 101	La Veta Ave	Consider pavement markings, speed tables, and traffic diverters to optimize as bike boulevard
	La Veta Ave		0.4	El Portal St	Sylvia St	
	Fourth St		0.2	Sylvia St	B St	
4	Class I	I	0.7	Moonlight Beach	Class I (Between I-5 and Saxony Rd)	Along south side of Encinitas Blvd
5	Cornish Dr	IIIB	0.9	D Street	San Elijo Ave	Consider pavement markings, speed tables, and traffic diverters to optimize bike boulevard
6	Class I	I	1.4	Santa Fe Dr	Chesterfield Dr	Install on east side of rail within Coast Hwy 101 ROW
7	Class I	I	1.0	Encinitas Blvd	Santa Fe Dr	Install on east side of rail
8	Coast Highway 101	II	0.1	J St	Santa Fe Dr	Buffering where right-of-way allows; striping along constrained segments
		IIB	5.2	Santa Fe Dr	Solana Beach	
9	Class I	I	1.7	K St	Cardiff Beach	Install on west side of rail
10	Glaucus St/Hymettus Ave	III	0.6	Vulcan Ave	Orpheus Ave	Sharrows and signage
11	Leucadia Blvd	IIB	1.3	Coast Highway 101	Piraeus St	Buffer existing bike lanes
12	Union St	III	0.2	Vulcan Ave	Class I	Build Class I to connect across I-5 - sharrows and signage and striping where right-of-way allows. PWP Crossing project
	Class I	I	0.2	Union St	Orpheus Ave	
	Union St	II	0.1	Orpheus Ave	Ocean View Ave	
	Class I	I	0.2	Ocean View Ave		

TABLE 3-1: Bicycle Projects (Cont.)

Segment ID	Street Name	Facility Type	Miles	From	To	Notes
13	Class I	I	0.1	Class I	Lazy Acres	North side of Encinitas Blvd
	Encinitas Blvd	IIB	0.3	Coast Highway 101	I-5 Southbound Off-ramp	Buffer existing bike lanes where right-of-way allows
		II	0.2	I-5 Southbound Off-ramp	Saxony Rd	
14	Santa Fe Dr	IIB	1.2	Vulcan Ave	Regal Rd	Buffer existing bike lanes
15	Norfolk Dr	III	0.5	San Elijo Ave	Carol View Dr	Sharrows and signage
16	*Pedestrian Facilities Only*					
17	Birmingham Dr	III	0.1	San Elijo Ave	Manchester Ave	Sharrows and signage
	Manchester Ave		0.1	Birmingham Dr	Rossini Dr	
	Rossini Dr		0.1	Manchester Ave	Montgomery Ave	
	Montgomery Ave		0.0	Rossini Dr	Mozart Ave	
18	La Costa Ave/Vulcan Ave Ramp	IIB	4.4	Coast Highway 101	City Limits	Buffer existing bike lanes where right-of-way allows
19	Class I	I	0.4	La Costa Ave	Leucadia Village Dr	PWP Project
	Orpheus Ave	II	1.7	Leucadia Village Dr	Vulcan Ave	
20	Piraeus St	II	1.4	La Costa Ave	Leucadia Blvd	Stripe bike lanes
21	Sky Loft Rd	III	0.4	Piraeus St	Burgundy Rd	Sharrows and signage
	Burgundy Rd		0.7	Sky Loft Rd	Private Rd	
	Urania Ave		0.6	Private Rd	Leucadia Blvd	
22	Saxony Rd	III	1.6	La Costa Ave	Leucadia Blvd	PWP Project
		II	1.2	Leucadia Blvd	Encinitas Blvd	
23	Quail Hollow Dr	II	0.5	Saxony Rd	Swallowtail Rd	Buffer existing bike lanes where right-of-way allows
	Quail Gardens Dr	IIB	4.7	Swallowtail Rd	Encinitas Blvd	
	Westlake St	II	0.3	Encinitas Blvd	Requeza St	
24	Garden View Rd	IIB	2.5	Leucadia Blvd	Glen Arbor Dr	Buffer existing bike lanes

TABLE 3-1: Bicycle Projects (Cont.)

Segment ID	Street Name	Facility Type	Miles	From	To	Notes
25	El Camino Real	IIB	3.0	Leucadia Blvd	Encinitas Blvd	Buffer existing bike lanes, install cycle track where right-of-way allows
		IV	3.4	Encinitas Blvd	Manchester Ave	
26	Rancho Santa Fe Rd	II	2.2	City Limits (near Las Olas Ct)	Encinitas Blvd	Buffer existing bike lanes where right-of-way allows
27	Leucadia Blvd/Olivenhain Rd	IIB	3.3	Piraeus St	Rancho Santa Fe Rd	Buffer existing bike lanes, north side only.
	Class I	I	1.8	I-5	El Camino Real	Construct new Class I and develop existing trail on south side into Class I
28	Cereus St	III	0.1	Hygeia Ave	Hermes Ave	Sharrows and signage
	Hermes Ave		0.2	Cereus St	Union St	
29	Union St	II	0.2	I-5	Saxony Rd	PWP Project
30	Class I	I	0.7	Class I	Encinitas Blvd	Develop existing trail into Class I
31	Via Cantebria	IIB	2.1	Garden View Rd	Encinitas Blvd	Buffer existing bike lanes
32	Town Center Dr	II	0.1	El Camino Real	Town Center Pl	Stripe bike lanes
	Via Cantebria		0.2	Town Center Dr	Existing Bike Lane	
33	Via Montoro	II	0.4	Via Cantebria	El Camino Real	Stripe bike lanes
34	Via Molena	II	0.4	Via Cantebria	El Camino Real	Stripe bike lanes
35	Mountain Vista Dr	IIB	2.3	El Camino Real	Glen Arbor Dr	Buffer existing bike lanes
36	Class I	I	3.9	Garden View Rd	Solana Beach	Develop existing utility right-of-way into Class I
37	Village Park Way	IIB	1.2	Mountain Vista Dr	Encinitas Blvd	Buffer existing bike lanes
38	Village Park Way	III	0.2	Willowspring Dr	Alley	Sharrows and signage
	Alley		0.0	Village Park Way	Springwood Ln	
	Springwood Ln		0.1	Alley	Morning Sun Dr	
	Morning Sun Dr		0.1	Springwood Ln	Rancho Santa Fe Rd	
39	Lone Jack Rd	III	1.5	Rancho Santa Fe Rd	Fortuna Ranch Rd	Sharrows and signage
40	El Camino Del Norte	III	0.8	Rancho Santa Fe Rd	City Limits	Sharrows and signage

TABLE 3-1: Bicycle Projects (Cont.)

Segment ID	Street Name	Facility Type	Miles	From	To	Notes
41	Calle Santa Cruz	IIIB	0.1	Camino Del Rancho	Chelsea Ln	Consider pavement markings, speed tables, and traffic diverters to optimize bike boulevard
	Chelsea Ln		0.0	Calle Santa Cruz	Chelsea Ln	
	Cole Ranch Rd		0.7	Chelsea Ln	7th St	
	7th St		0.1	Cole Ranch Rd	Rancho Santa Fe Rd	
42	Encinitas Blvd	II	0.1	Saxony Rd	Calle Magdalena	North side of Encinitas Blvd
		IIB	4.5	Calle Magdalena	Rancho Santa Fe Rd	Buffer existing bike lanes - south side only through El Camino Real, then both sides
	Class I	I	2.1	Saxony Rd	El Camino Real	South side of Encinitas Blvd with connector to Oakcrest Park Dr
43	Manchester Ave	II	2.5	Rancho Santa Fe Rd	El Camino Real	PWP Project
		IIB	0.9	Manchester Ave	San Elijo Ave	Buffer existing bike lanes - west side of Manchester
	Class I	I	1.9	Manchester Ave	San Elijo Ave	East side of Manchester
44	D St	III	0.5	Third St	Stratford Dr	Sharrows and signage
	Stratford Dr		0.7	D St	Santa Fe Dr	
45	Class I	I	0.8	Encinitas Blvd	Regal Rd	PWP Project
46	Calle Magdalena	II	0.2	Encinitas Blvd	Private Rd	PWP Project
	Class I	I	0.2	Private Rd	Requeza St	
47	Requeza St	II	0.7	I-5	Bonita Dr	Stripe bike lanes
48	Regal Rd	II	0.5	Requeza St	Santa Fe Dr	Stripe bike lanes
49	Nardo Rd	II	0.5	Requeza St	Santa Fe Dr	PWP Project
	MacKinnon Ave		0.7	Santa Fe Dr	Birmingham Dr	
50	Class I	I	0.2	Requeza St	Melba Rd	Develop driveway into Class I
	Bonita Dr	II	0.2	Melba Rd	Santa Fe Dr	Stripe bike lanes where right-of-way allows - sharrows and signage along constrained segments
	Windsor Rd	II	0.1	Santa Fe Dr	Munevar Rd	
		III	0.4	Munevar Rd	Villa Cardiff Dr	

TABLE 3-1: Bicycle Projects (Cont.)

Segment ID	Street Name	Facility Type	Miles	From	To	Notes
51	Balour Dr	II	0.4	Encinitas Blvd	Melba Rd	Stripe bike lanes where right-of-way allows - sharrows and signage along constrained segments
		III	0.2	Melba Rd	Santa Fe Dr	
52	Melba Rd	III	0.5	Regal Rd	Bonita Dr	Stripe bike lanes where right-of-way allows - sharrows and signage along constrained segments
		II	0.3	Bonita Dr	Balour Dr	
		III	0.3	Balour Dr	Crest Dr	
	Crest Dr	III	0.2	Melba Rd	Santa Fe Dr	
53	Willowspring Dr	II	1.0	El Camino Real	Encinitas Blvd	Stripe bike lanes
54	Cerro St	III	0.9	Encinitas Blvd	El Camino Real	Sharrows and signage
55	Santa Fe Dr	II	0.2	Santa Fe Dr	Nardo Rd	Buffer existing bike lanes - PWP Project
		IIB	1.2	Nardo Rd	Monterey Vista Way	
		II	0.5	Monterey Vista Way	El Camino Real	
56	Summit Ave	III	0.6	Santa Fe Dr	Westminster Dr	Sharrows and signage
	Westminster Dr		0.2	Rubenstein Ave	Montgomery Ave	
	Montgomery Ave		0.0	Westminster Dr	Mozart Ave	
57	Ocean Crest Rd	II	0.2	Mackinnon Ave	Justin Rd	Stripe bike lanes
	Justin Rd		0.1	Ocean Crest Rd	Munevar Rd	
	Munevar Rd		0.0	Justin Rd	Windsor Rd	
58	Villa Cardiff Dr	II	0.8	Mackinnon Ave	Birmingham Dr	PWP Project
59	I-5 Bridge	II	0.1	Warwick Ave	Villa Cardiff Dr	Bridge over I-5 - PWP Project
60	Woodlake Dr	III	0.4	Windsor Rd	Lake Dr	Sharrows and signage
61	Lake Dr	III	0.7	Santa Fe Dr	Birmingham Dr	Sharrows and signage
62	Birmingham Dr	III	1.0	Manchester Ave	Lake Dr	Sharrows and signage
63	Manchester Ave	III	0.7	Birmingham Dr	San Elijo Ave	Sharrows and signage

TABLE 3-1: Bicycle Projects (Cont.)

Segment ID	Street Name	Facility Type	Miles	From	To	Notes
64	Mackinnon Ave	III	0.1	Birmingham Dr	Liverpool Dr	Sharrows and signage
	Liverpool Dr		0.1	Mackinnon Ave	Edinburg Ave	
	Edinburg Ave		0.1	Liverpool Dr	Chesterfield Dr	
	Chesterfield Dr		0.1	Edinburg Ave	Oxford Ave	
	Oxford Ave		0.1	Chesterfield Dr	Norfolk Dr	
65	Class I	I	1.0	Birmingham Dr	Manchester Ave	PWP Project
66	San Elijo Ave	II	0.4	Chesterfield Dr	Kilkenny Dr	Striping where right-of-way allows; sharrows and signage along constrained segments
		III	0.2	Kilkenny Dr	Manchester Ave	
67	Mozart Ave	III	0.1	Montgomery Ave	San Elijo Ave	Provides connection from existing canyon trail down to proposed class I
68	Class I	I	0.8	Manchester Ave	Solana Beach	Provides connection to existing lagoon trails - PWP Project
		Total Proposed Miles	**103.0**			

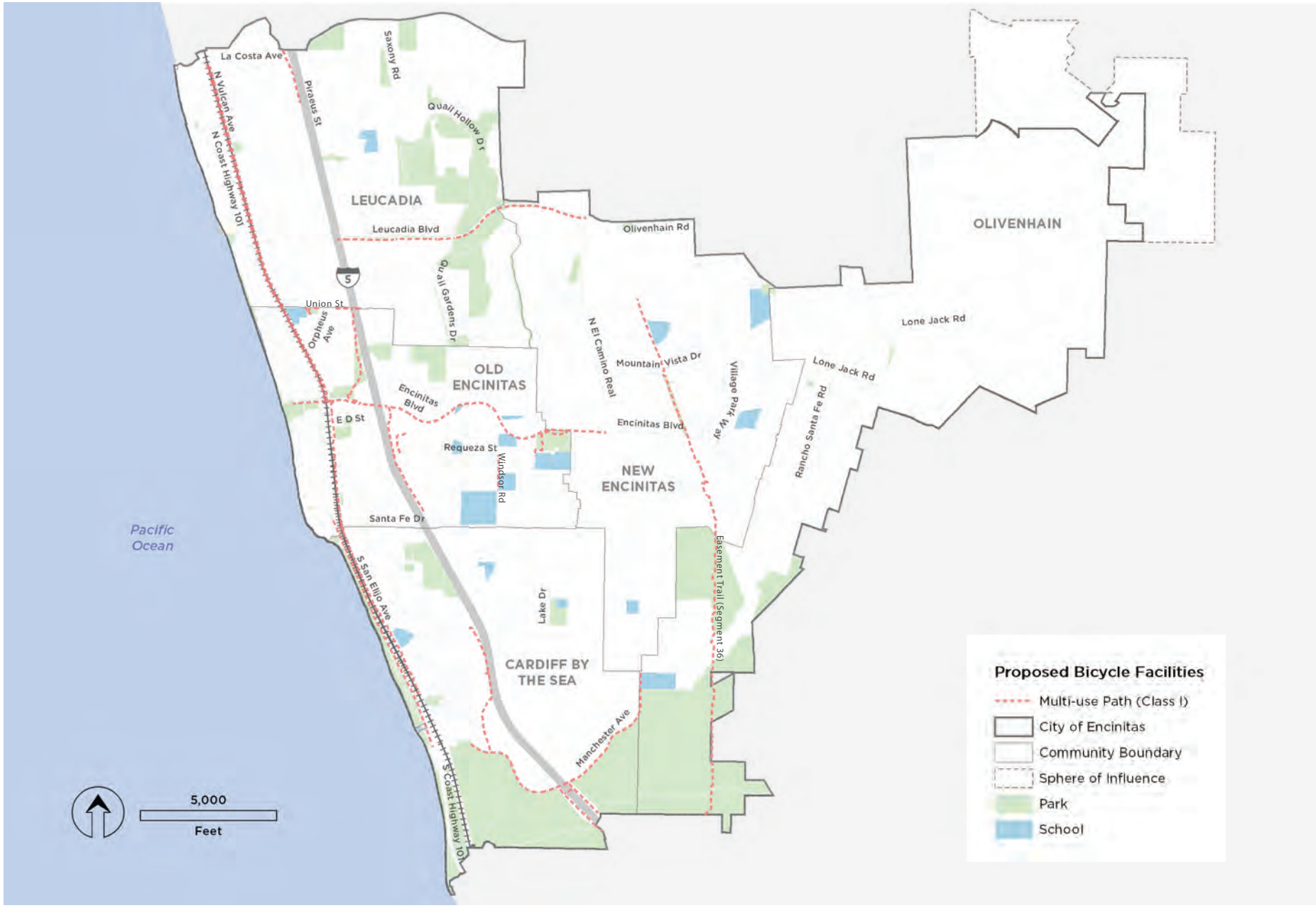
Class I Multi-use Paths

Several Class I multi-use paths are proposed along major arterials, along a utility easement through New Encinitas, and as part of the PWP. These facilities would be paved, multi-use, major connectors with regional routes (see Figure 3-2: Proposed Class I Bicycle Facilities). These are in addition to the previously planned Coastal Rail Trail along the entire length of the City of Encinitas between Carlsbad and Solana Beach. This Class I path, in particular, would be a boon to local and regional bicyclists and pedestrians, connecting San Diego County's coastal cities within the rights-of-way of the existing rail line and on roadways where necessary, such as over the lagoons. This segment forms the north-south backbone of the overall bikeway system, serving as the connector between several other east-west facilities (see Figure 3-29: CRT Feeders).

An important north to south network is proposed by Caltrans under the PWP project. This combination of bicyclist and pedestrian improvements are considered to be Class I multi-use paths. The PWP protected facilities can be connected to the coastal communities by the addition of an east to west corridor. This plan proposes connecting the PWP trails at Encinitas Boulevard and I-5 to the rail corridor, and then on to beach destinations. This Class I can also be extended east of I-5 to better connect these areas with the limited existing freeway crossings. A similar east to west corridor can be created along Leucadia Boulevard, using an existing wide walkway system that can be retrofitted into a multi-use trail with relatively inexpensive walkway widening and minor grading.

Class I Multi-use Pathways

FIGURE 3-2: Proposed Class I Bicycle Facilities

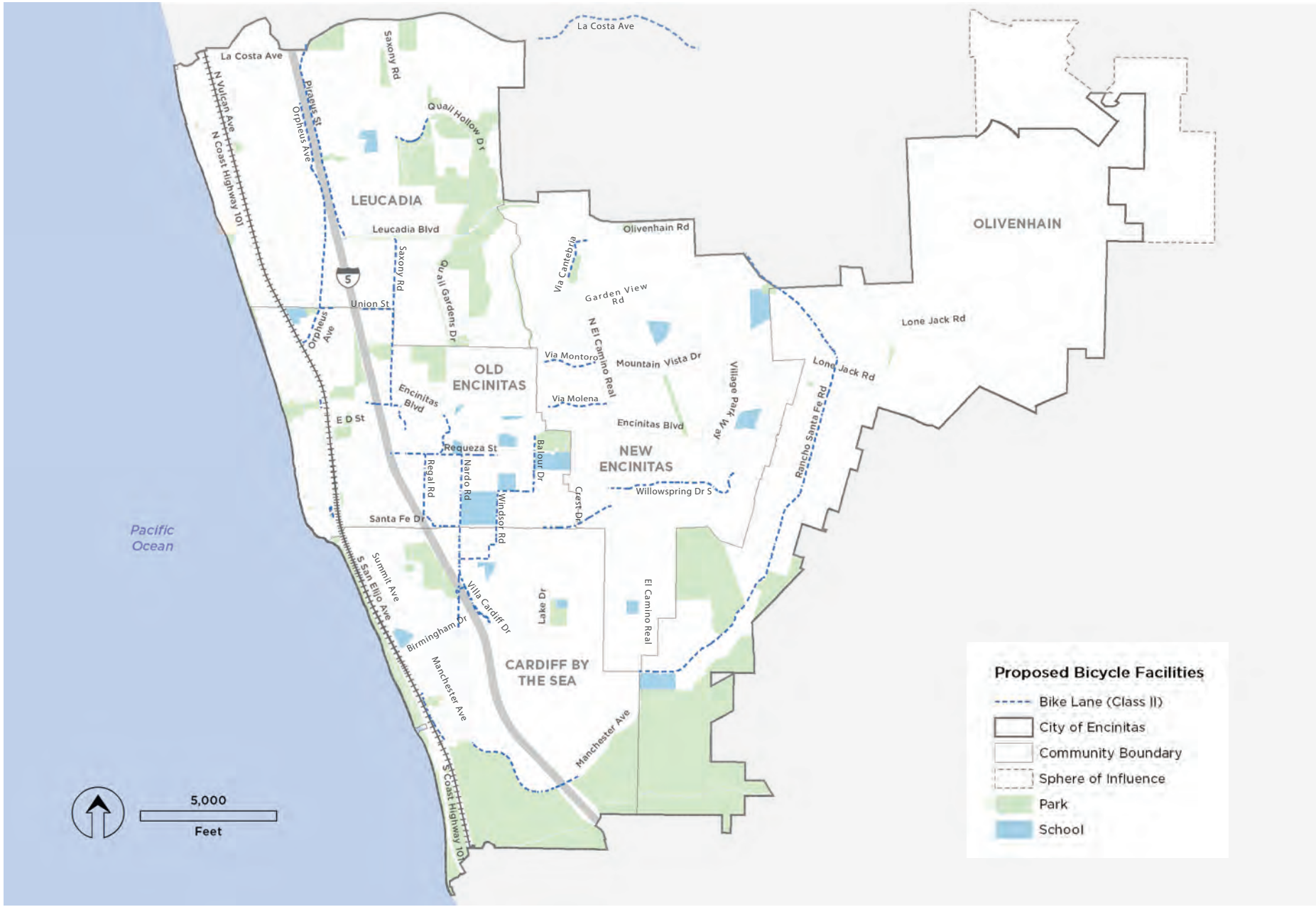


Class II Bicycle Lanes

Class II bicycle lanes are proposed wherever roadway width allowed, but standard Class II bicycle lanes are no longer the preferred configuration because along some roadways, they place bicyclists in a potentially vulnerable position relative to parked cars where drivers may inadvertently open car doors into the bicyclists' path, known as the "door zone." Only where right-of-way are not sufficient for buffering are conventional Class II bicycle lanes recommended (see Figure 3-3: Proposed Class II Bicycle Facilities).

Class II Bicycle Lanes

FIGURE 3-3: Proposed Class II Bicycle Facilities

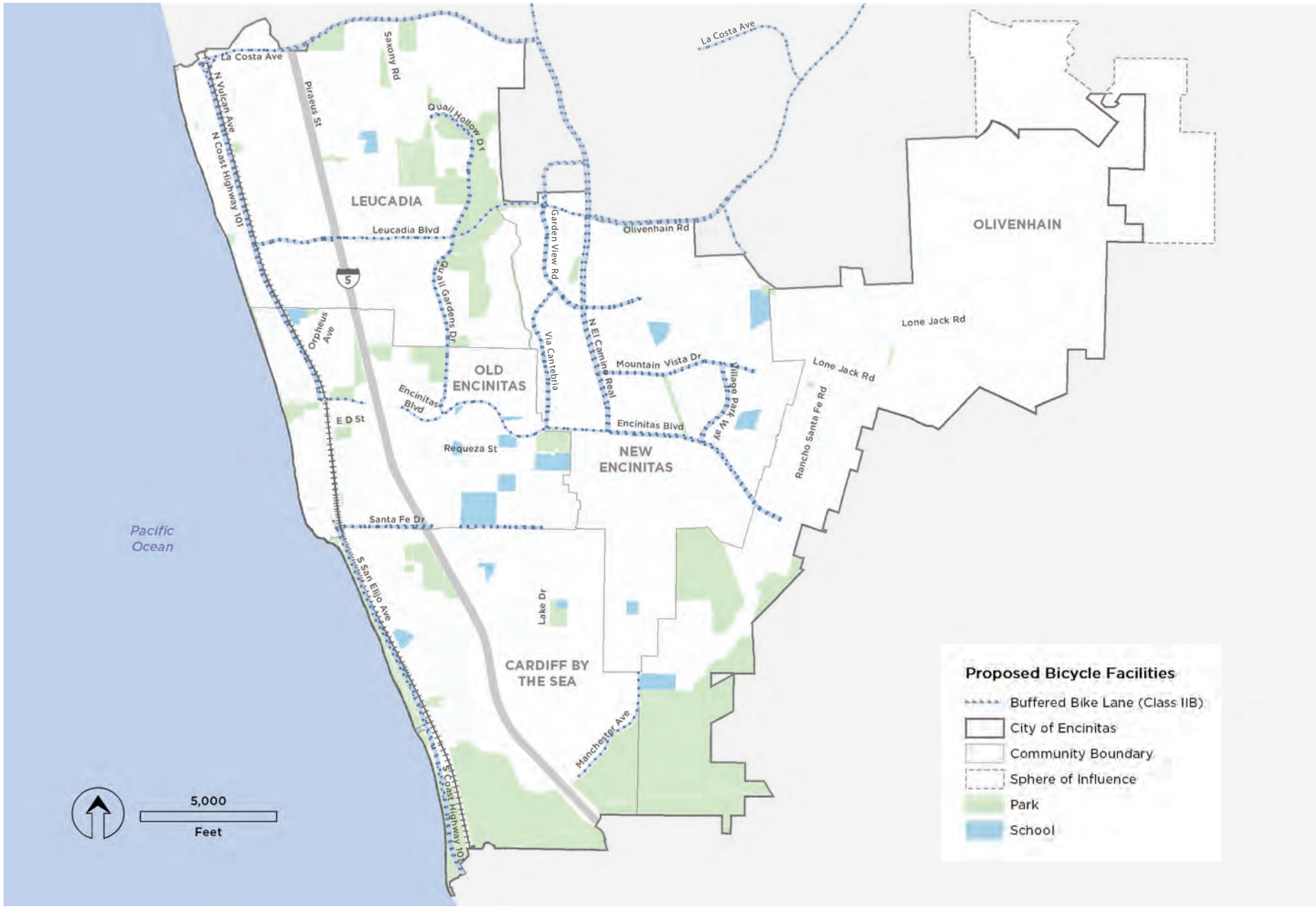


Class IIB Buffered Bicycle Lanes

Buffered bicycle lanes are proposed wherever possible as an upgrade from standard Class II bicycle lanes. This was strongly supported in public outreach and represents the largest category (see Figure 3-4: Proposed Class IIB Bicycle Facilities).

Class IIB Buffered Bicycle Lanes

FIGURE 3-4: Proposed Class IIB Bicycle Facilities

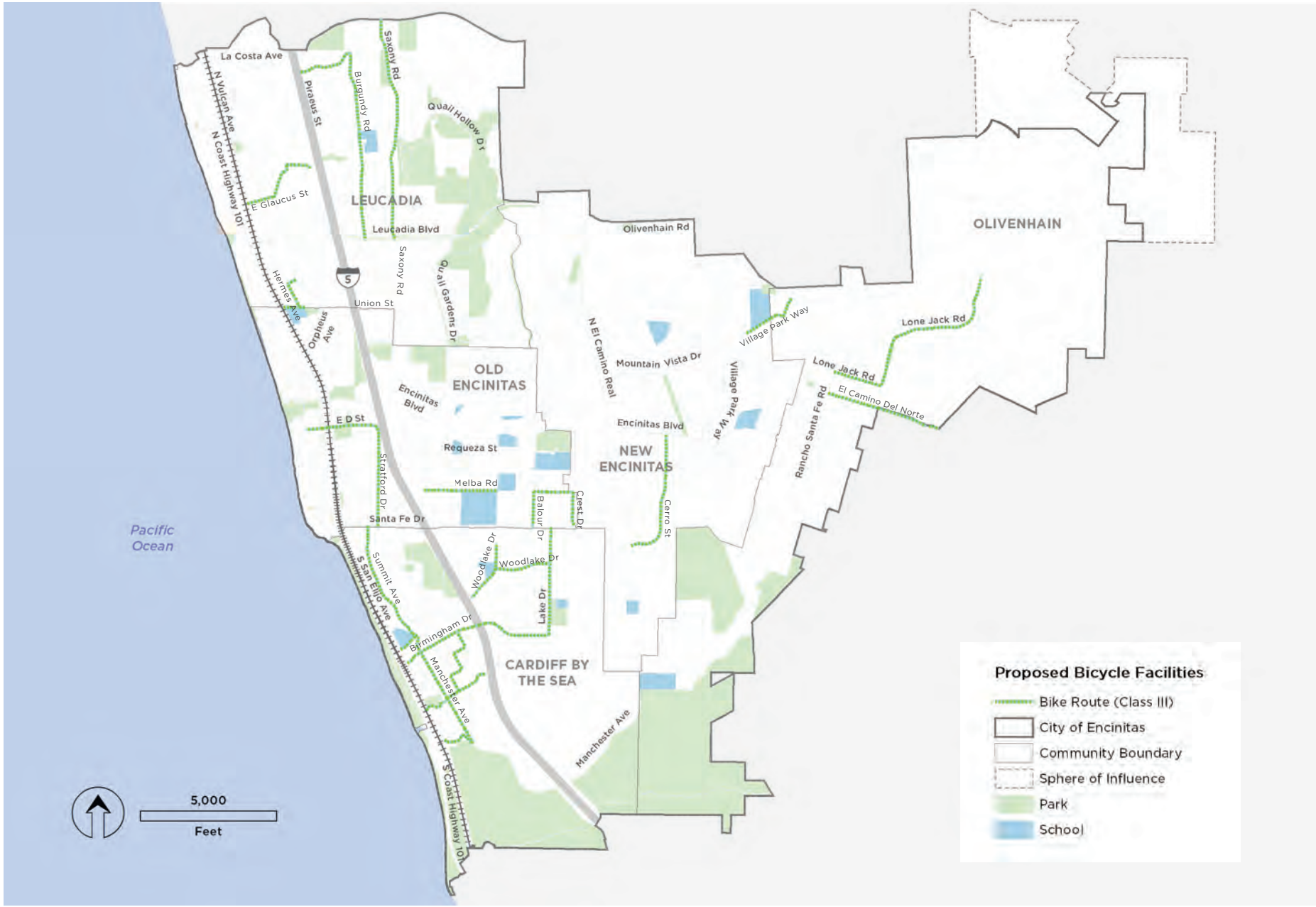


Class III Bicycle Routes

Relatively fewer Class III bicycle routes are proposed compared to other bicycle facility types, since this type of facility is not considered to be effective or nearly as safe as other categories of bicycle facilities. Routes are generally used to delineate connections where roadway width is insufficient for upgrades to Class II bicycle lanes (see Figure 3-5: Proposed Class III Bicycle Facilities).

Class III Bicycle Routes

FIGURE 3-5: Proposed Class III Bicycle Facilities



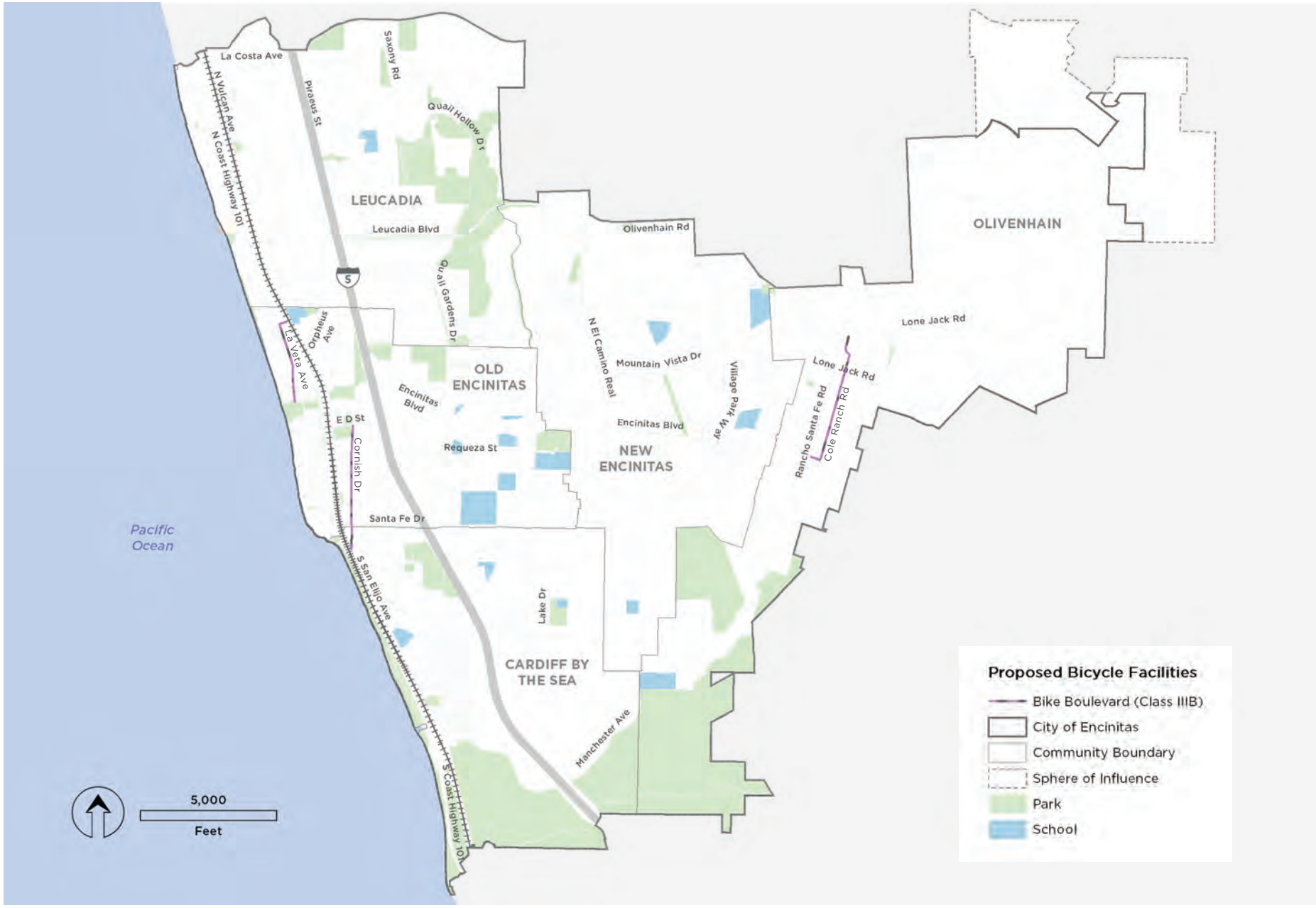
Class IIIB Bicycle Boulevards

Bicycle boulevards are proposed in three locations that include La Veta Avenue, Cornish Drive, and Cole Ranch Road to take advantage of appropriately low volume roadways to make important low stress connections that allow bicyclists to avoid having to ride on parallel high traffic volume routes. Additionally, traffic-calming features can be used to reduce motor vehicle speeds on these streets. Diverters, for example, are traffic-calming devices that can be installed to limit through movements by vehicles while still allowing through bicyclist movement (see Figure 3-6: Proposed Class IIIB Bicycle Facilities).

Class IIIB Bicycle Boulevard

Example of Vehicle Diverter

FIGURE 3-6: Proposed Class IIIB Bicycle Facilities

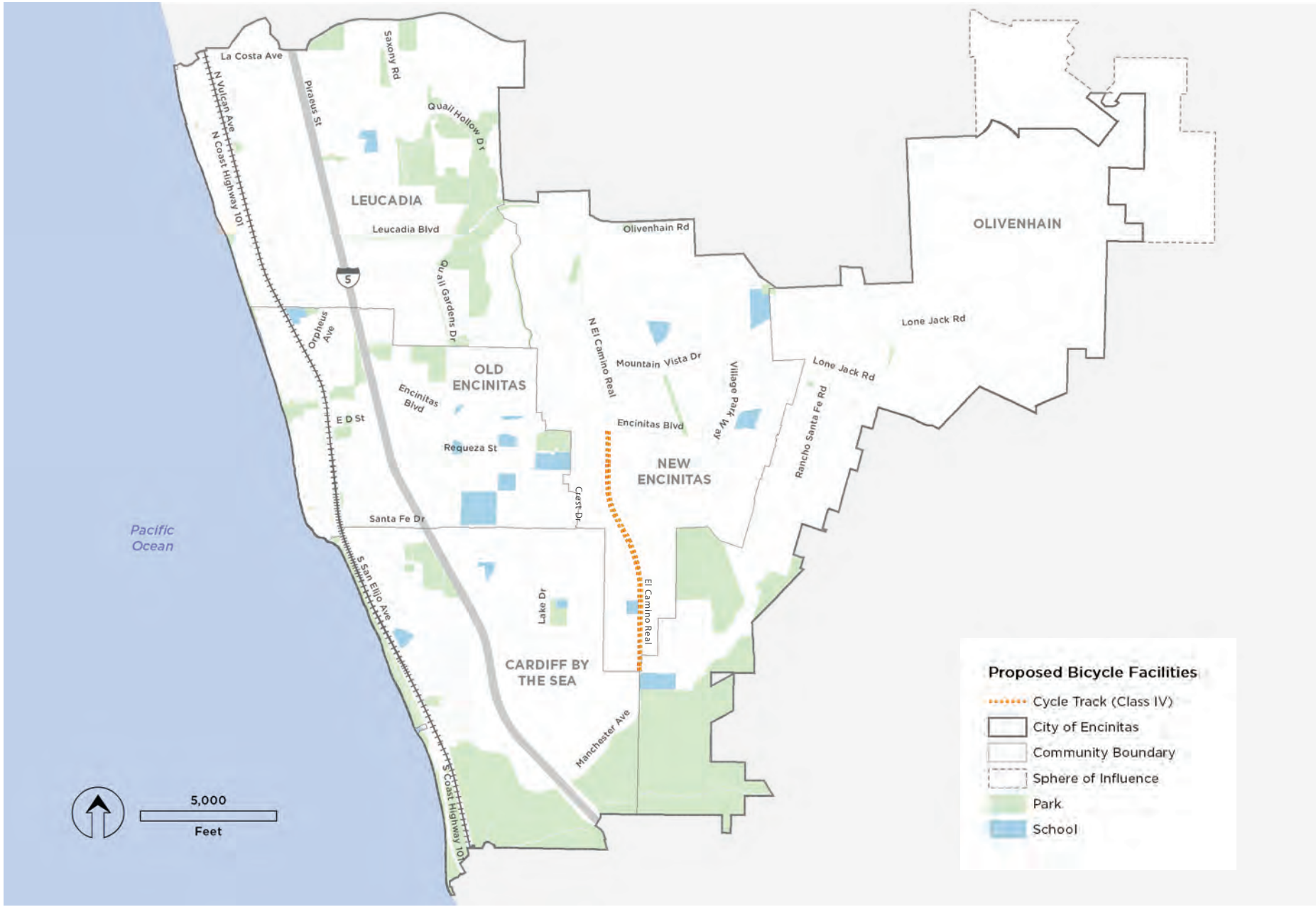


Class IV Cycletracks

A separated bikeway or cycletrack is proposed along El Camino Real between Encinitas Boulevard and Manchester Avenue to take advantage of excessive pavement width to create the most comfortable facility possible (see Figure 3-7: Proposed Class IV Bicycle Facilities).

Class IV Cycle Tracks

FIGURE 3-7: Proposed Class IV Bicycle Facilities



Type 1 Nature Trail

Type 2 Recreational Trail

Type 4 Sidewalk

PROPOSED PEDESTRIAN FACILITIES

Pedestrian improvements consist primarily of the addition of sidewalks and trail segments across Encinitas. Many of these were gaps identified in public comment and verified in field analysis. Pedestrian improvements are categorized by their own types to differentiate them from the bicycle facilities noted previously and are shown in Figure 3-8: Proposed Pedestrian Facilities.

Type 1 Nature Trails

Typically unpaved, with native soil surfacing, and narrow tread widths. Not generally used for transportation unless this trail provides for a short-cut between areas where no roadway sidewalk exists.

Type 2 Recreational Trails

Typically, unpaved but with firm surfacing, and wide enough for users to pass each other. More likely to be used for transportation with firm surface and greater widths than nature trails.

Type 3 Road Edge Enhancement

This pedestrian facility type consists of minimal physical improvements, primarily to highlight direct routes to major destinations, through neighborhoods where wider walkways are not possible. For example, where space permits, it may be marked by painted striping to distinguish it from the rest of the roadway. The intent is to provide a route and improve safety and awareness for walkers using the road edge, while still maintaining the character of the neighborhood, and not requiring the removal of road edge improvements or parking.

Type 4 Sidewalks

Typically consist of walks attached to the edge of roadways.

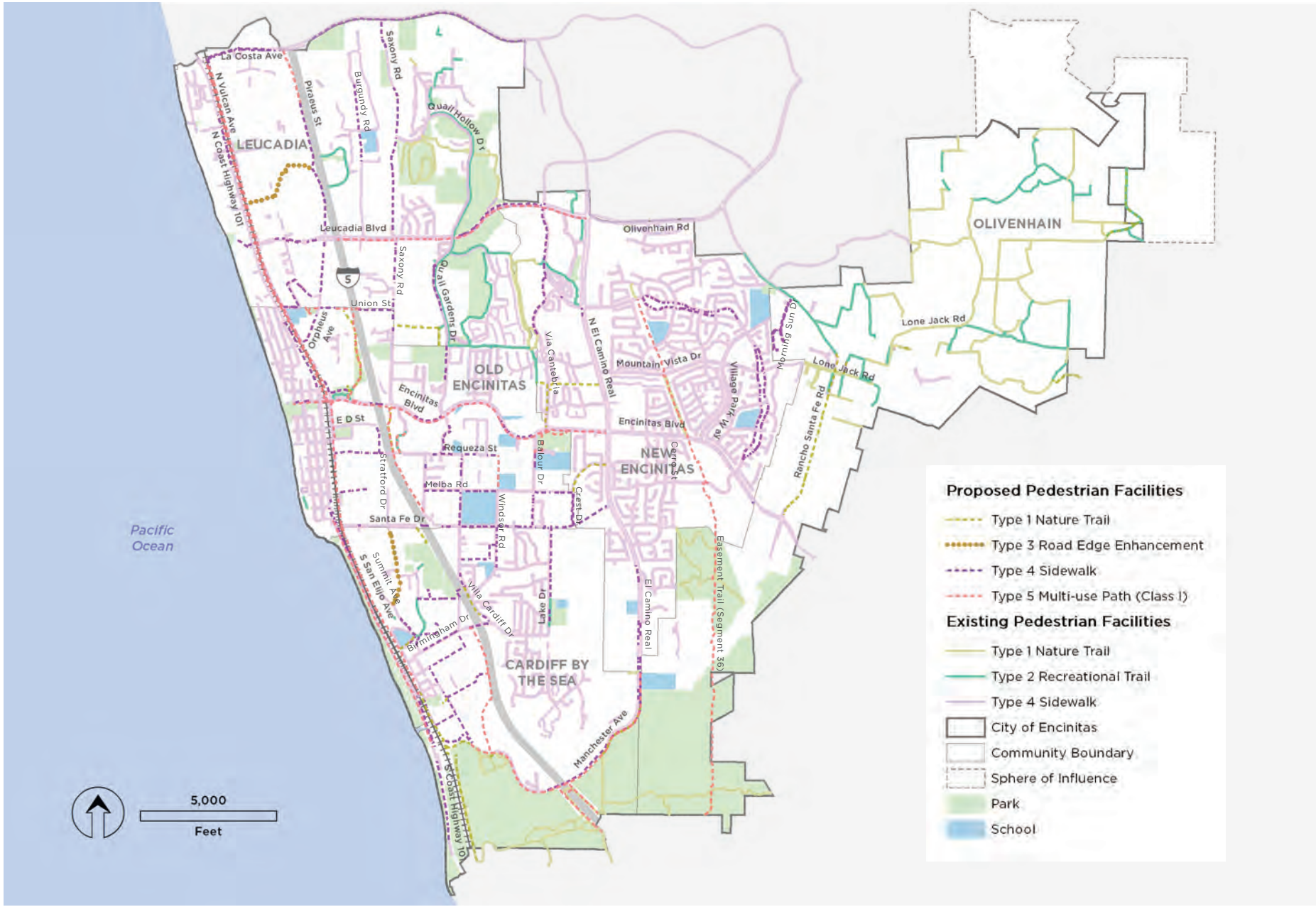
Type 5 Class I multi-use paths

These are the same facilities noted under the bicycle facility recommendations as Class I multi-use paths because they serve both user groups.

Type 3 Road Edge Enhancement- Where space allows, consider 2-3 foot wide decomposed granite side paths

Type 3 Road Edge Enhancement- Where space is tight, stripe at least a 2 foot wide pavement portion

FIGURE 3-8: Proposed Pedestrian Facilities



LANE AND PATH SURFACES

The residents of Encinitas have expressed a desire to avoid asphalt paved surfaces wherever possible. Although asphalt is often the least expensive and easiest treatment to install, especially when the facility is on an asphalt road, it is not always the preferred surface. The community will need to balance initial costs, long term maintenance costs, aesthetics, and environmental sustainability. However, there are minimum ADA standards, which will require a firm surface, and for some types of bicycles using narrow, high pressure tires.

Table 3-2 indicates a wide variety of surface types that can be used for the different surfaces for bicycle and pedestrian facilities. All of the surfaces indicated in this table are capable of meeting ADA requirements as well as high tire pressure requirements for bicycle transportation. However, some will require more of an initial cost and others will require a higher level of long-term maintenance or replacement costs.

Stabilized/Emulsified Decomposed Granite

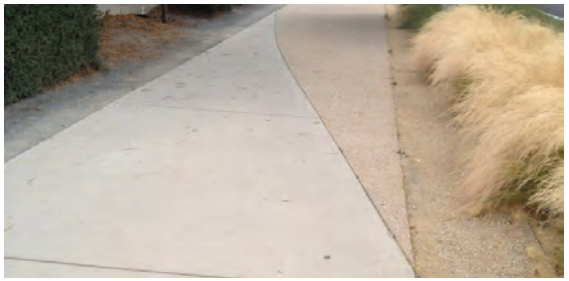
Stabilized DG with Concrete Banding or Permeable Concrete Edging

Standard Asphalt

Standard Concrete

Enhanced Asphalt with Chip Seal or Colored Aggregate

Integral Color Concrete with Exposed Aggregate Seeded Edge



Integral Colored Concrete with Seeded DG Aggregate

TABLE 3-2: Lane and Pathway Surfaces Option Comparison

Encinitas Coastal Rail Trail Surface Options Comparison	NS-1	NS-2	SS-1	SS-2	ES-1	ES-2	ES-3
	Stabilized/ Emulsified Decomposed Granite	Stabilized DG with Concrete Banding or Permeable Concrete Edging to Avoid Erosion	Standard Asphalt	Standard Concrete	Enhanced Asphalt with Chip Seal or Colored Aggregate	Integral Color Concrete with Exposed Aggregate Seeded Edge	Integral Colored (or Stained) Concrete with Seeded DG Aggregate (with Permeable Edge Option)
Type	**Natural Surface**		**Standard Surface**		**Enhanced Surface**		
Costs	**76,200 = Current sf associated with surface improvements**						
Construction Cost Per SF	$2.50-$3.50	$3.50-$4.50	$3.00-$4.00	$4.00-$6.00	$5.00-$6.00	$8.00.-$10.00	$10-$13
Monitoring for Repair	Annually	Annually	2-4 years	5-years	5-7 years	5-7 years	10+
% Of Trail Needing Repair*	6%	5%	2%	0.50%	2%	0.5%	0.5%
Est. Repair Cost Per SF**	$3.50	$3.50	$4.00	$8.00	$5.00	$8.00	$10.50
Approx. Annual Minor Repair	$16,000	$13,000	$6,000	$3,000	$7,500	$3,000	$4,000
Long Term Replacement	Damaged Portions	Damaged Portions	Full Replacement	Damaged Portions	Full Replacement	Damaged Portions	Damaged Portions
Time Before Replacement	5-8 years	6-10 years	5-10 years	15-25 years	8-10 years	15-25 years	25-35 years
Replacement Costs***	50%	40%	80%	115%	80%	120%	120%
User Types Supported (Open Dots Indicate Acceptable But Not Ideal)							
Hiking	○	○	○	○	○	○	○
Equestrian	○	○					
Walking	●	●	○	○	○	●	●
Running	●	●	○	○	○	●	●
Stroller	○	○	●	●	●	●	●
Wheelchair/ADA	○	○	●	●	●	●	●
BMX/Mtn. Bike	●	●	○	○	○	○	○
Hybrid Bike	●	●	●	●	●	●	●
Road Bike (Skinny Tire)	○	○	●	●	●	●	●
Skateboards	○	○	●	●	●	●	●
In-Line Skating	○	○	●	●	●	●	●
Features/Issues							
Natural Aesthetics	High	High	Low	Low	Moderate	Moderate- High	High
Loose Surface Concerns	Moderate	Moderate	None	None	Low	None	None
Primary Materials	Base/DG/Emulsifier	Base/DG/Emulsifier/ Conc.	Base/Asphalt	Base/Conc./Rebar	Base/Asphalt/Aggregate	Base/Conc./Rebar	Base/Conc./Rebar
Available Contractors	Constrained	Constrained	Readily Available	Readily Available	Readily Available	Readily Available	Constrained
Reflectivity	Low	Low	Low	High	Moderate	Moderate	Low
Heat Gain	Low	Low	High	Low	Moderate-High	Low	Moderate
Permeability	Slight	Slight	Poor	Poor	Poor	Poor	Poor
Runoff Contaminants	Slight	Slight	Poor	None	Poor	None	None
Erosion Of Material	High	Moderate	Moderate	Slight	Slight	None	None
Siltation / Dust	Moderate	Moderate	None	None	None	None	None

* These are rough estimates for comparison purposes and may or may not be required on an annual basis.
** Based on weathering forces, wear from moderate use including bike tires.
*** Based on % of the original construction costs needs to also include demolition and hauling / disposal but would need to include grading (costs not inflated, using today's cost).

RECOMMENDATIONS BY NEIGHBORHOOD

The following sections describe the recommended projects by neighborhood. They are shown by category and the numbering is used in the Bicycle Projects Table (Table 3-1) as well. In some cases, in addition to the numbered bicycle projects, multiple alternative project locations are designated by letters, such as potential rail line crossings. Other locations address specific crossing treatments, such as flashing beacons, roundabouts or bridges. Figures 3-9 through 3-18 show the proposed pedestrian and bicycle improvements per community.

Leucadia

- **A** Rebuild bridge and construct multi-use path on the east side of the rail line, connect under bridge to westbound lanes on La Costa Avenue or install bicycle lanes on North Vulcan Avenue with intersection controls on westbound lanes of La Costa to South Coast Highway, and provide a pedestrian connection to South Coast Highway.
- **B** Install a multi-use path from La Costa Avenue to Encinitas Boulevard on the east or west side of the rail line. The goal is to have these paths on both sides.

Old Encinitas

- **C** Install multi-use path at the intersection of Vulcan Avenue and Encinitas Boulevard with pre-fabricated bridges or at-grade improvements. At-grade improvements could be an interim solution pending later implementation of permanent bridges.
- **D** Install Class I multi-use path between E Street and Encinitas Boulevard. Dependent on transit station relocation.

Cardiff by the Sea

- **E** Cornish Drive from San Elijo Avenue to Santa Fe Drive including a full street closure OR one-way northbound configuration.
- **F** Pole Road and connections to San Elijo Avenue and Manchester Avenue including a bridge OR private property trail.

New Encinitas

This neighborhood's most widespread recommended facility type is Class IIB buffered bicycle lanes on many of its arterials, but it also has this plan's sole Class IV cycletrack on South El Camino Real.

Olivenhain

Olivenhain's rural character and low density resulted in a limited number of facility recommendations. However, a highlight is a Class IIIB bicycle boulevard on Cole Ranch Road that will allow users to avoid having to ride or walk along busy Rancho Santa Fe Road.

FIGURE 3-9: Leucadia Proposed Pedestrian Projects

FIGURE 3-10: Leucadia Proposed Bicycle Projects

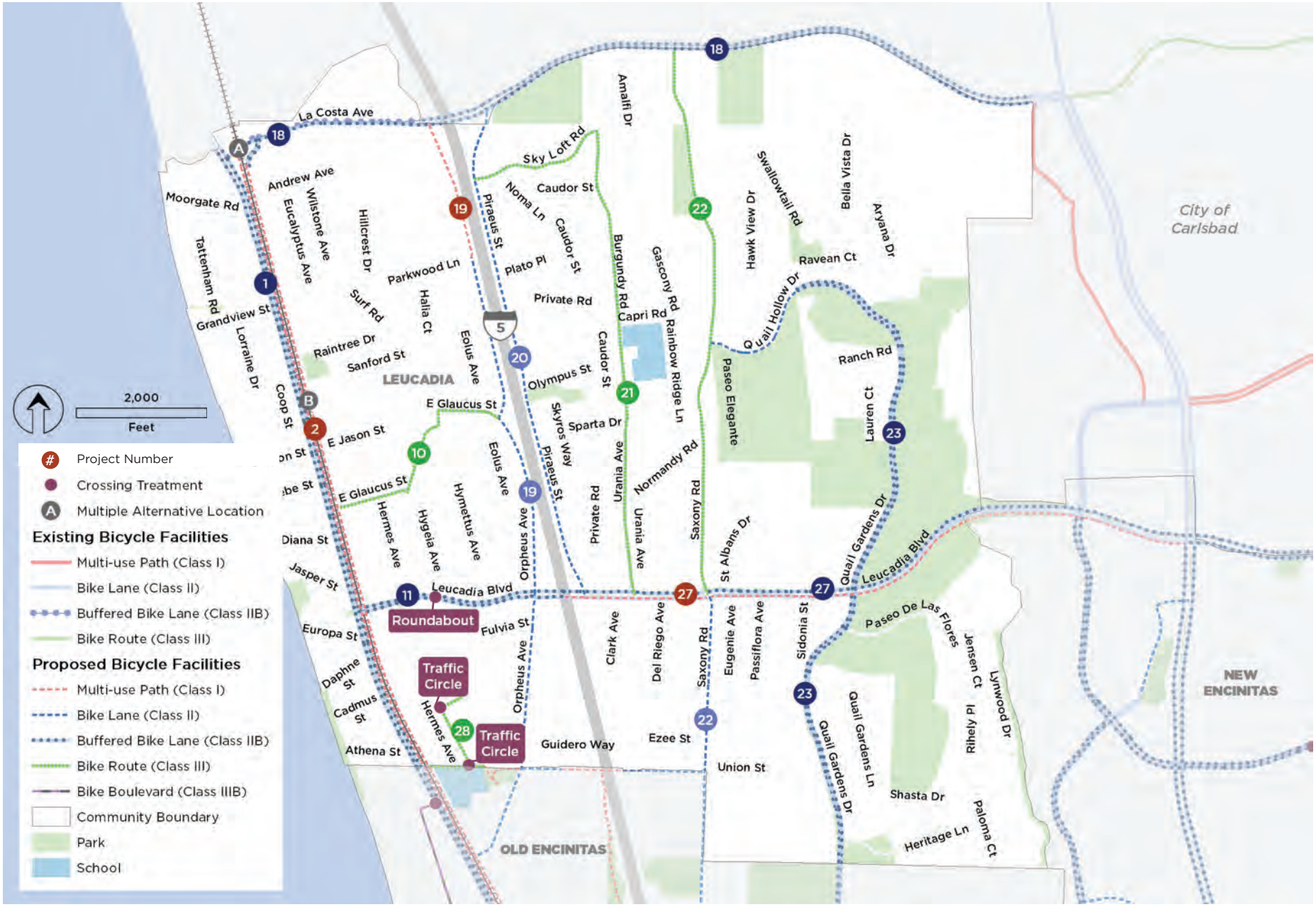


FIGURE 3-11: Old Encinitas Proposed Pedestrian Projects

FIGURE 3-12: Old Encinitas Proposed Bicycle Projects

FIGURE 3-13: Cardiff by the Sea Proposed Pedestrian Projects

FIGURE 3-14: Cardiff by the Sea Proposed Bicycle Projects

FIGURE 3-15: New Encinitas Proposed Pedestrian Projects

FIGURE 3-16: New Encinitas Proposed Bicycle Projects

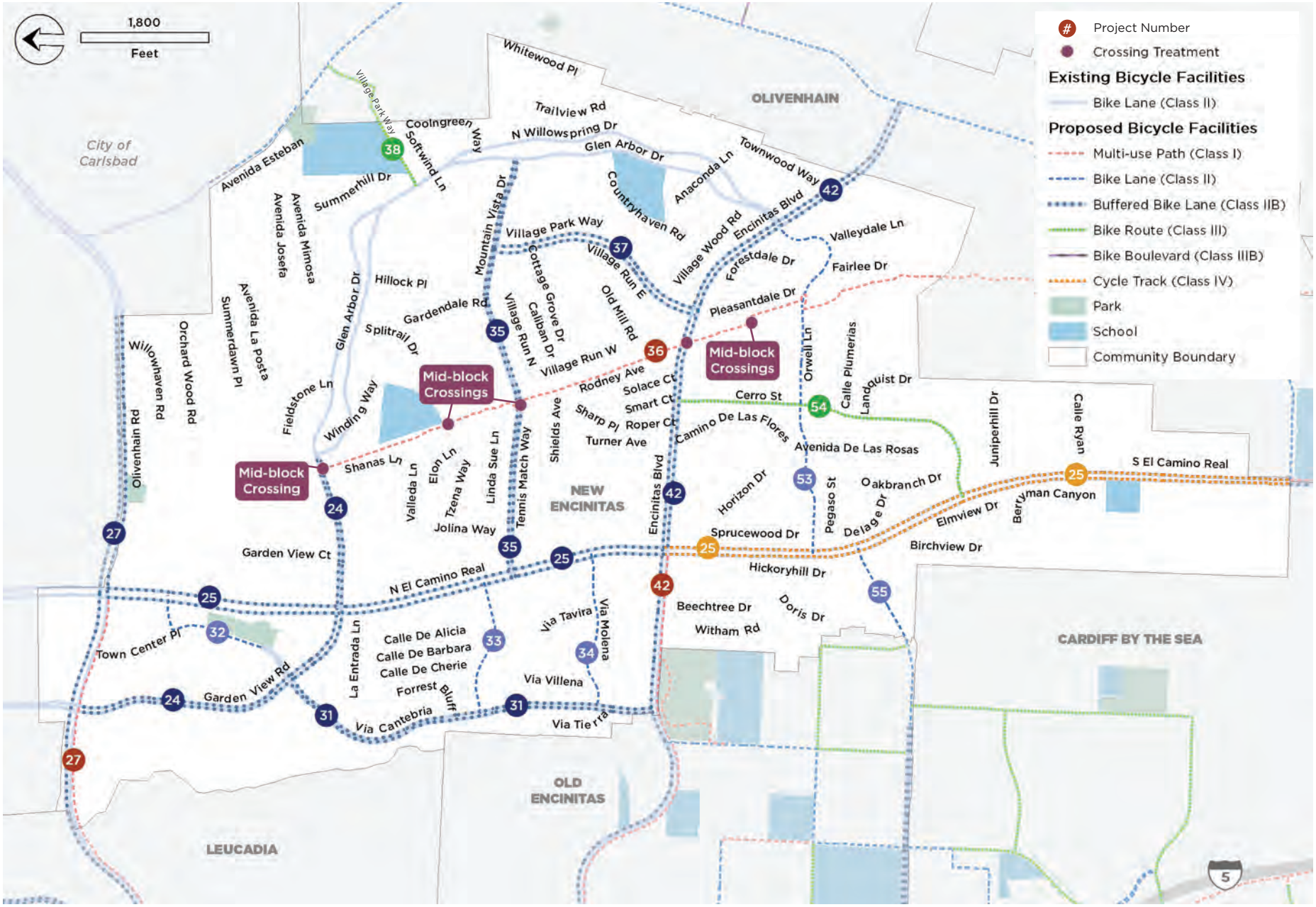


FIGURE 3-17: Olivenhain Proposed Pedestrian Projects

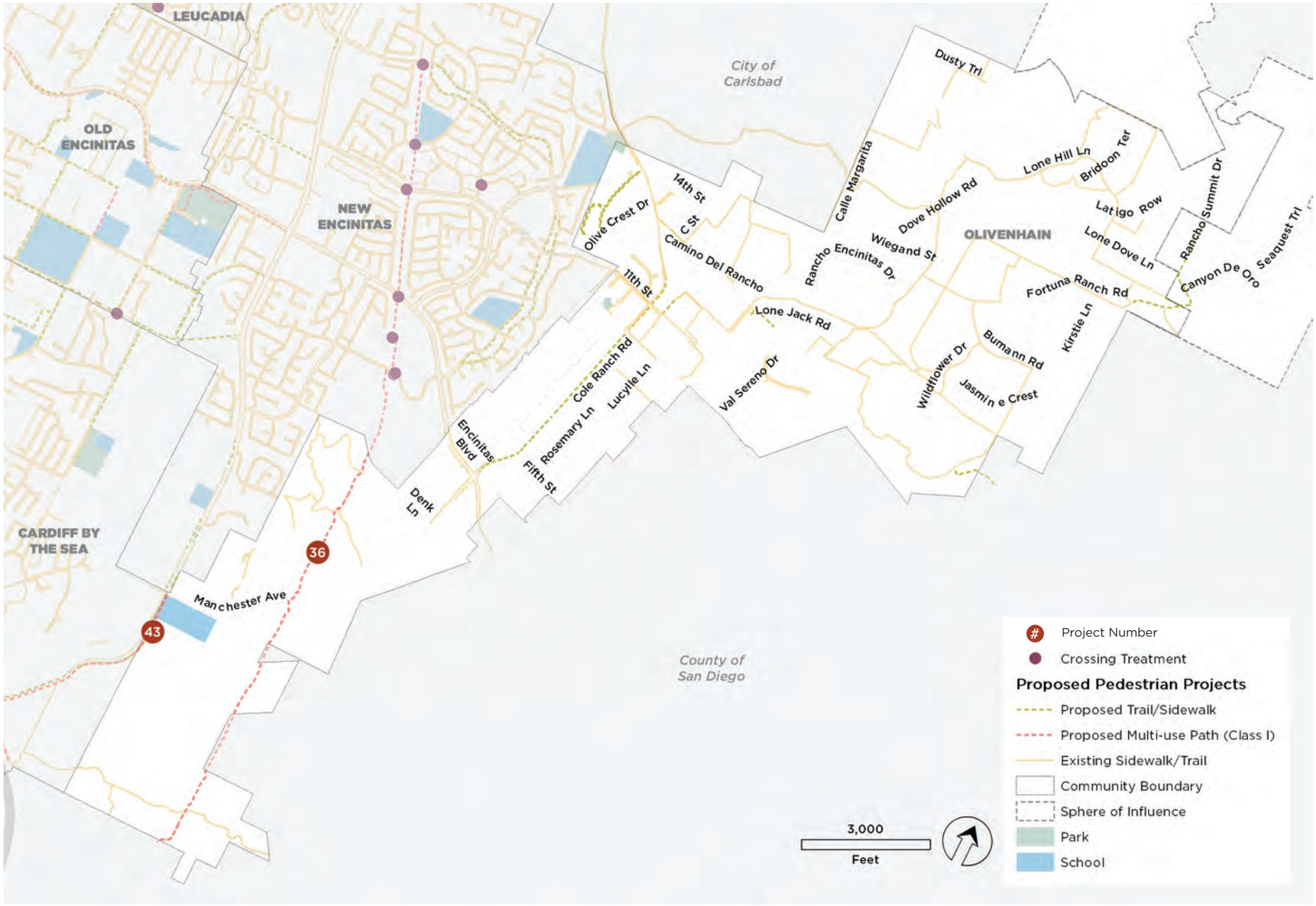
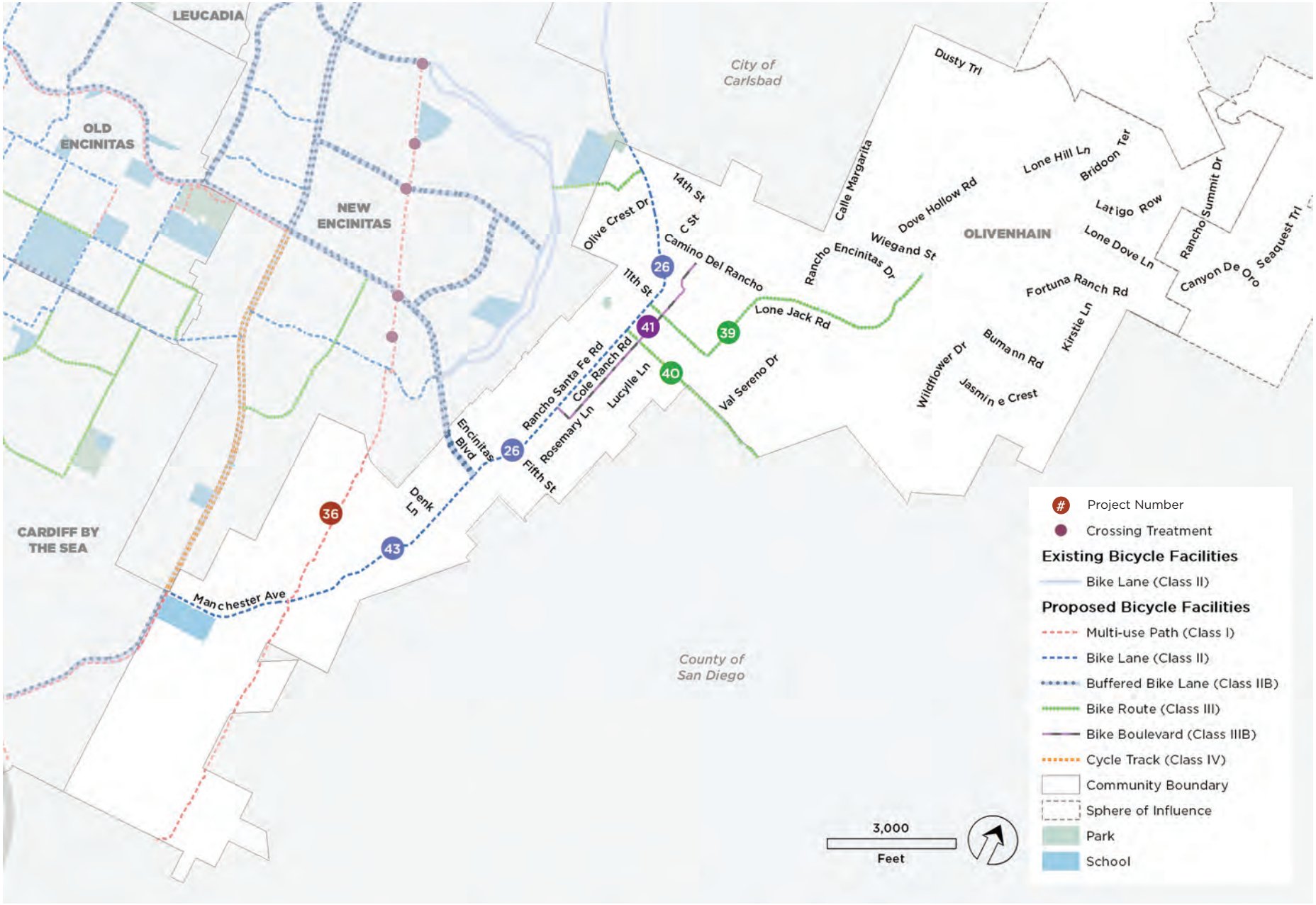


FIGURE 3-18: Olivenhain Proposed Bicycle Projects



RESULTING LEVEL OF COMFORT

The level of comfort analysis employed to evaluate existing conditions was re-applied following the identification of recommendations. As expected, the resulting pedestrian PLOC improved marginally, primarily due to pedestrians' higher tolerance for adjacent traffic volumes and speeds. However, the bicycle level of comfort analysis showed that BLOC would improve across Encinitas with implementation of the recommended projects, particularly along the coast and major arterials, this is due to the implementation of the Class I Coastal Rail Trail that would provide an alternative to riding on Coast Highway 101 or Vulcan/San Elijo Avenue, and Class IIB buffered bicycle lanes on arterials in other Encinitas neighborhoods.

Portions of Coast Highway 101 are comfortable for users now, while others need a great deal of improvement

FIGURE 3-19: Future Pedestrian Level of Comfort

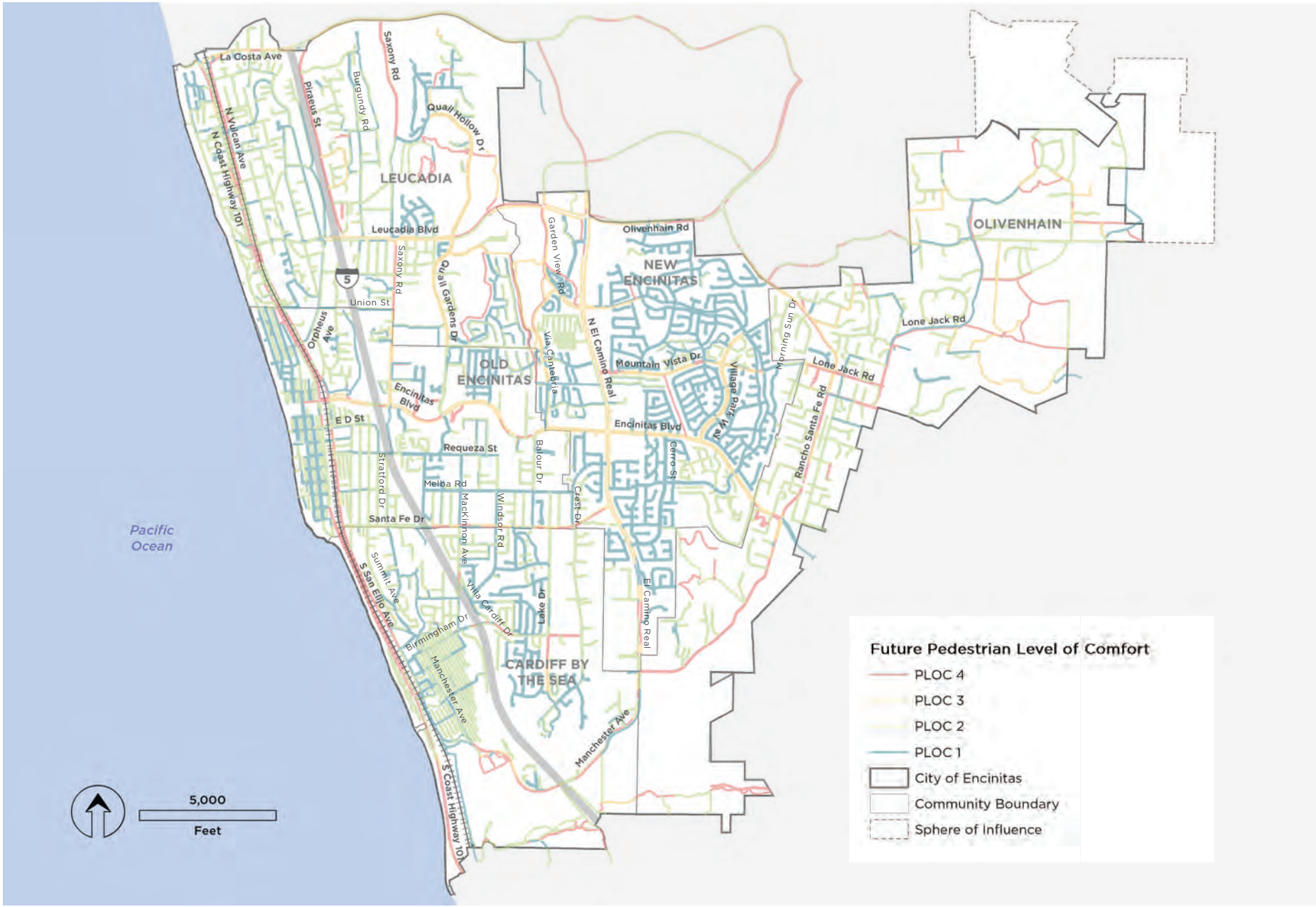
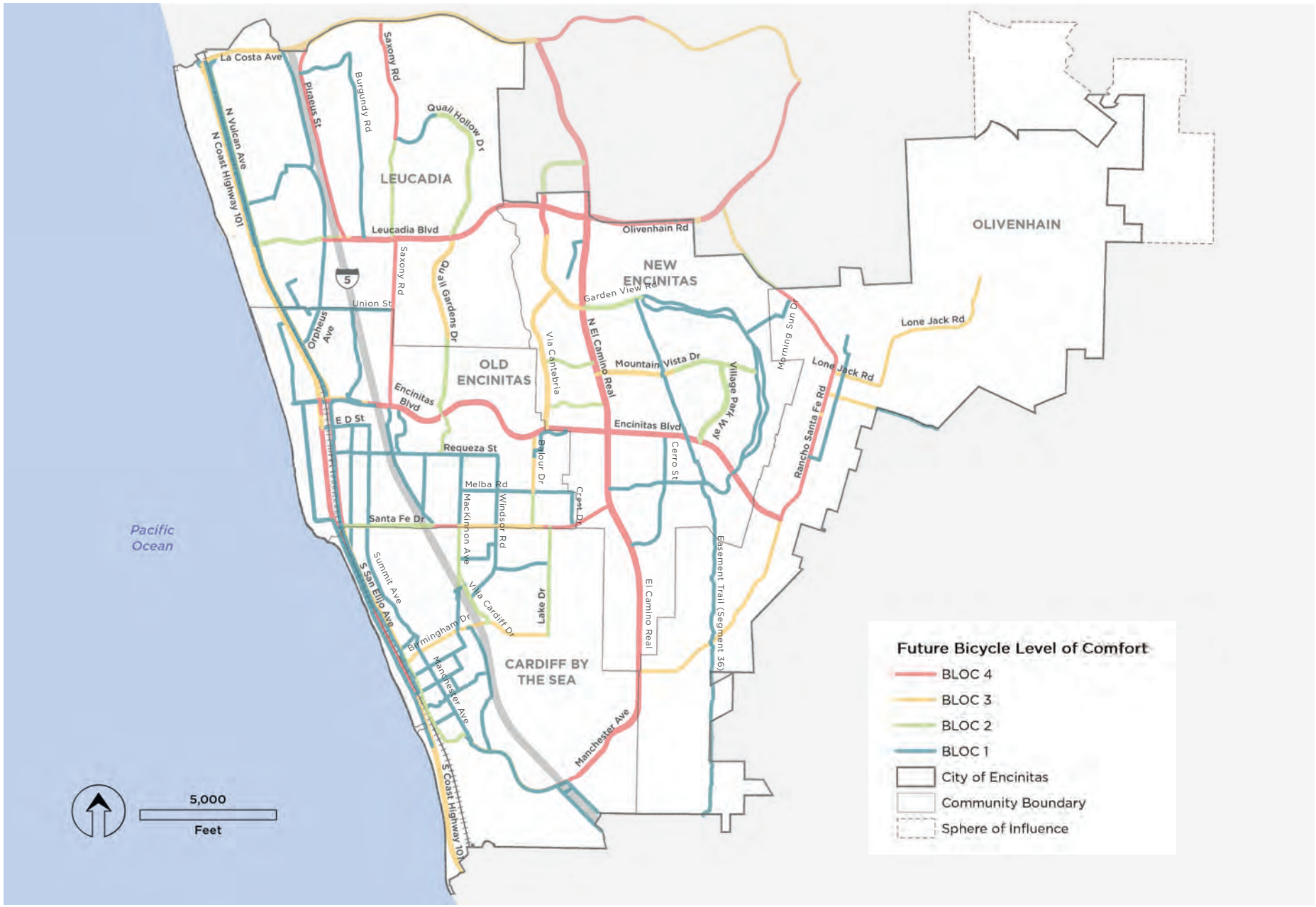


FIGURE 3-20: Future Bicycle Level of Comfort



RAIL CORRIDOR VISION STUDY RECOMMENDATIONS

This active transportation master plan was coupled with other City mobility planning projects, in particular the Rail Corridor Vision Study, which specifically addressed the rail right-of-way and the coastal strip along each side of it.

Existing and proposed Coastal Rail Trail cross-sections

The following pages show the existing and proposed condition of four different sections of the Coastal Rail Corridor. Figure 3-21 shows the proposed condition for the SANDAG Coastal Rail Trail on the east as well as a proposed improvement to the Coastal Bluff trail on the west. The current facility is a pedestrian only wide pathway, with some that use it for bicycling. The southbound on-road portion of the travel lanes are currently not continuous with bicycle lanes. The proposed condition will result in the elimination of one lane of travel on the southbound side, the addition of a dual buffered bicycle lane on the southbound side and the development of a Class I multi-use path for pedestrians and bicyclists. Parking will remain or be enhanced on both sides of the roadway.

Figure 3-22 also shows the proposed condition of the SANDAG Coastal Rail Trail. The west side of the cross section, which is the southbound segment with the existing Coastal Bluff trail, will be treated in a similar fashion as described above. The double buffering of the bicycle lanes will not be possible, however in this segment.

Figure 3-23 has a much more complex set of improvements, given the desire to extend a protected Class 1 multi-use path along Vulcan Avenue and through the high volume intersection of Encinitas Boulevard and Vulcan Avenue. The west side of the section showing the Coast Highway, will be slightly modified to accommodate a bicycle lane all the way to Encinitas Boulevard when heading northbound on the highway. On the east side using Vulcan Avenue, a multi-use two-way path is proposed to be constructed on the east side of the road. This can be accommodated by combining the existing walkway and the bicycle lane into one facility. Two bridges have been shown that will continue the fully protected facility over the intersection, taking advantage of the existing slope conditions for a reasonable ramp to get above the roadway. More discussion on the bridge concepts are provided in a later section of this chapter.

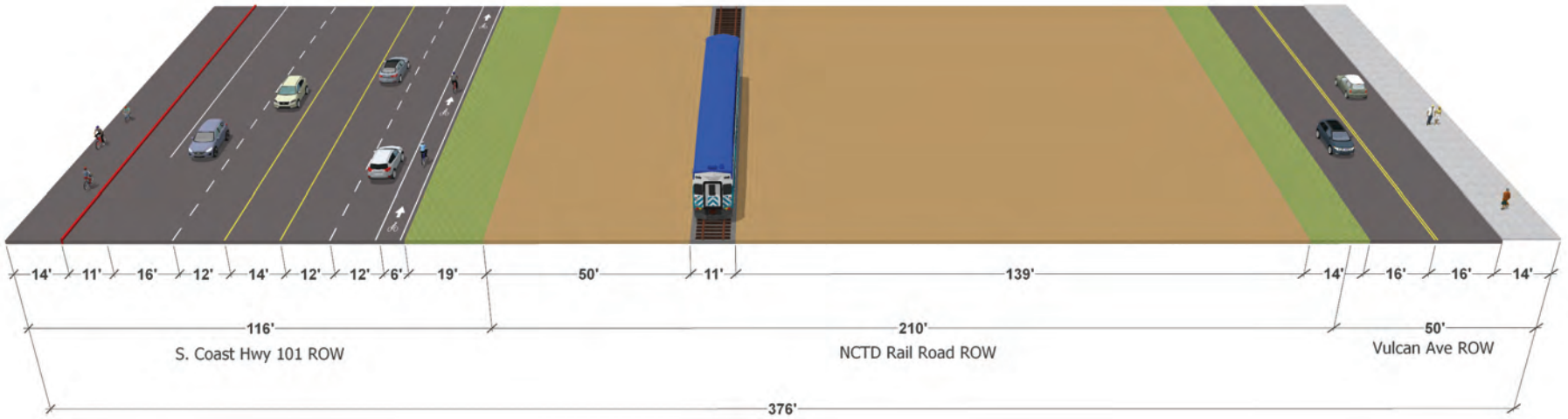
Figure 3-24 shows a variety of options of how walking trails and a Class 1 multi-use facility could be provided within the railroad right-of-way on the east side, west of Vulcan Avenue and also how it could be configured on the west side of the railroad right-of-way, worked in with the Leucadia Streetscape project proposed for this area. The final configuration of this cross section will need further feasibility analysis, negotiations with NCTD, and community input on the options.

Coast Highway 101 Exiting Conditions

Vulcan Avenue Existing Conditions

FIGURE 3-21: Liverpool Drive Existing and Proposed Coastal Rail Trail Cross-Section

Before



After

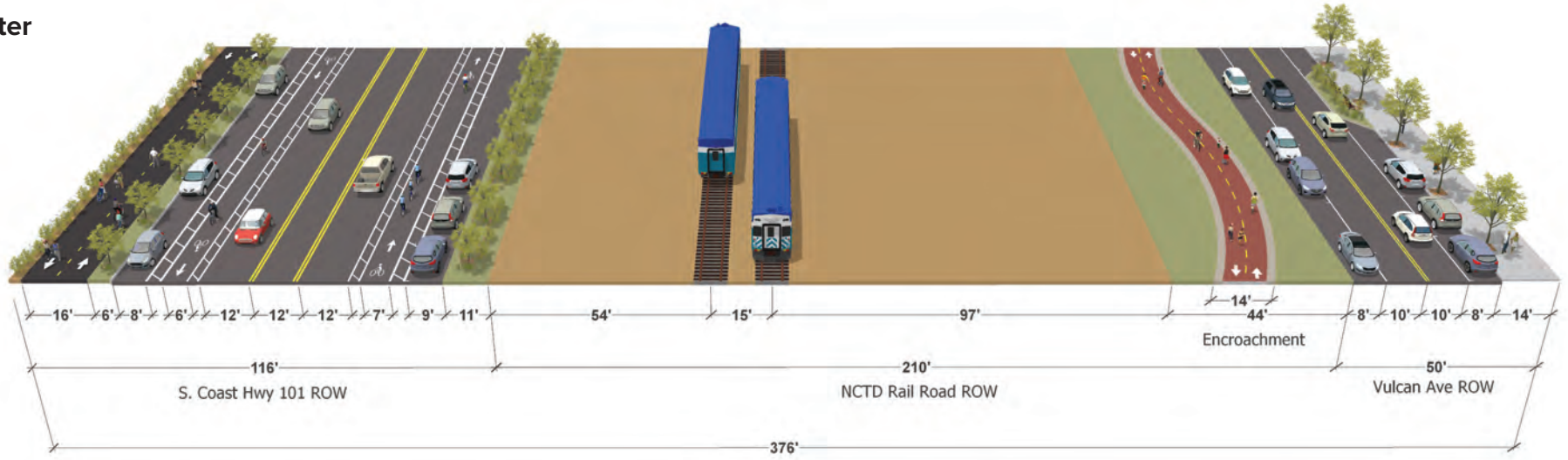
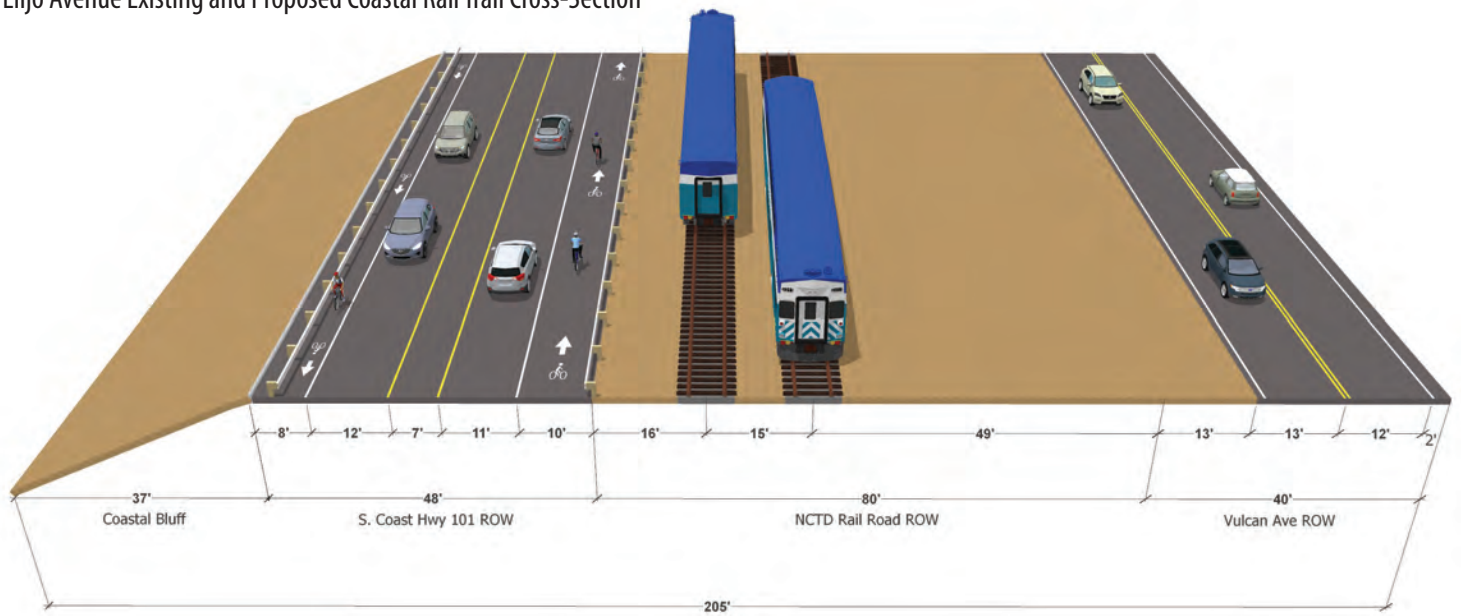


FIGURE 3-22: San Elijo Avenue Existing and Proposed Coastal Rail Trail Cross-Section

Before



After

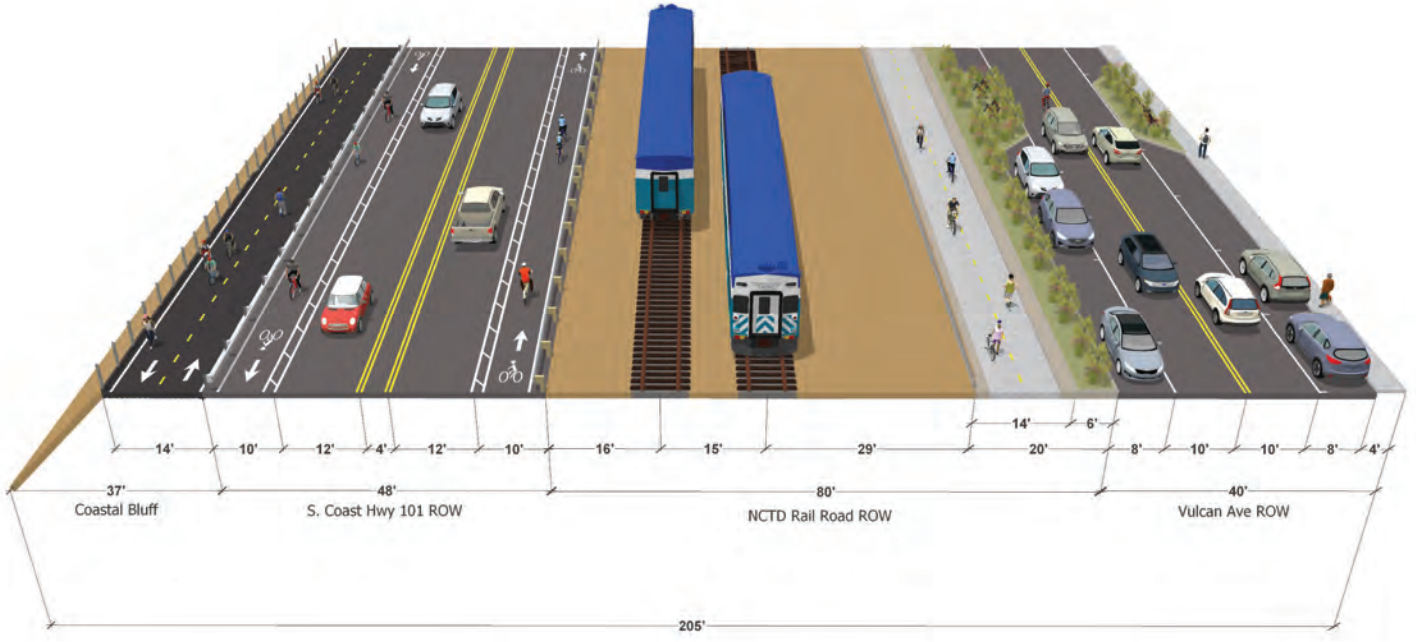
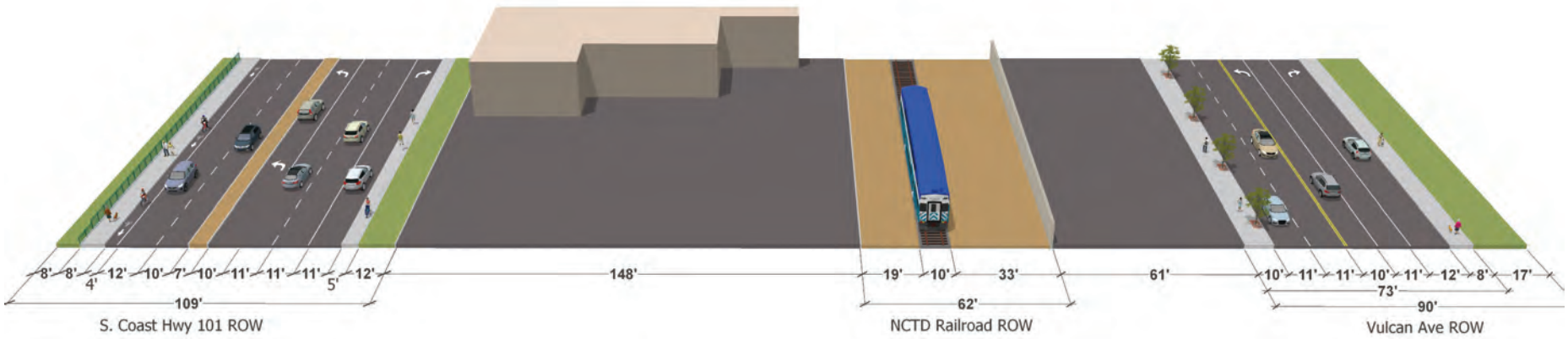


FIGURE 3-23: Encinitas Boulevard Existing and Proposed Coastal Rail Trail Cross-Section

Before



After

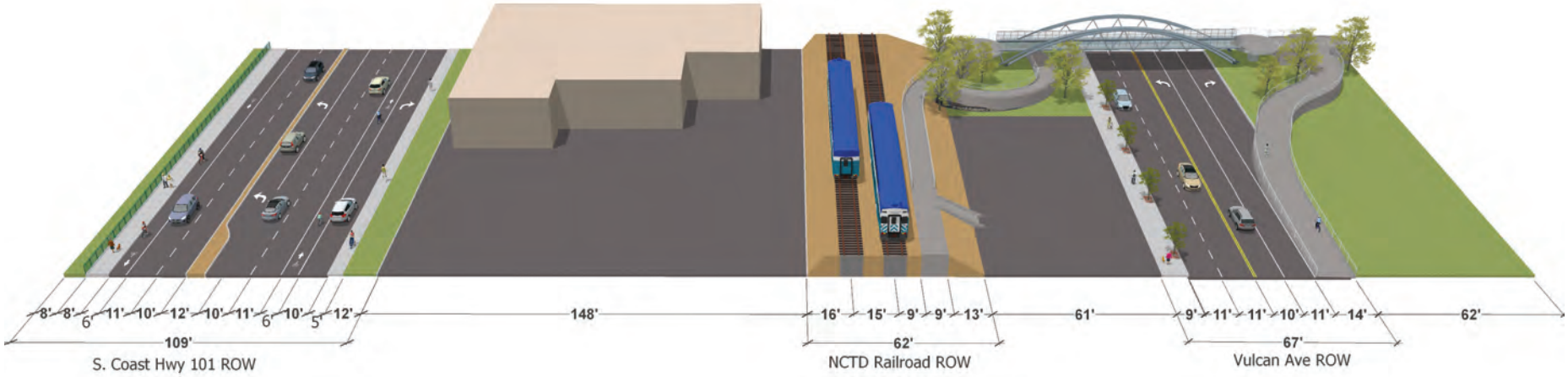
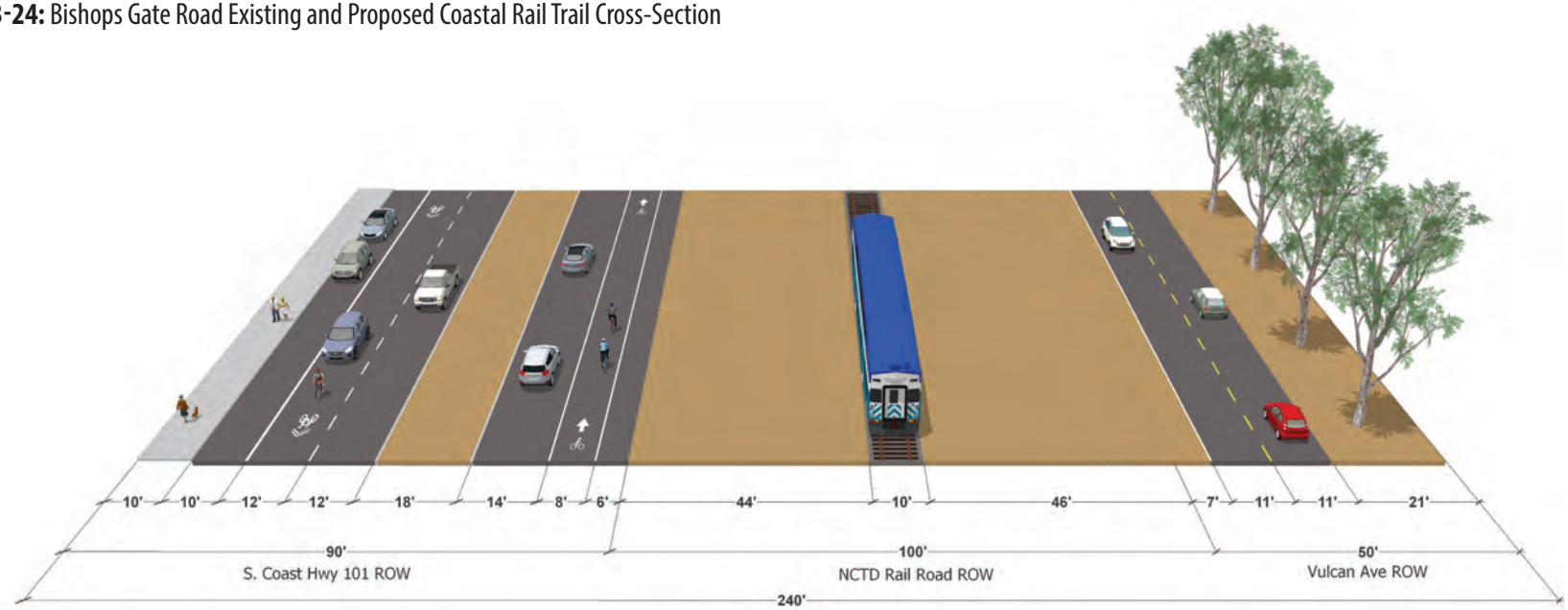


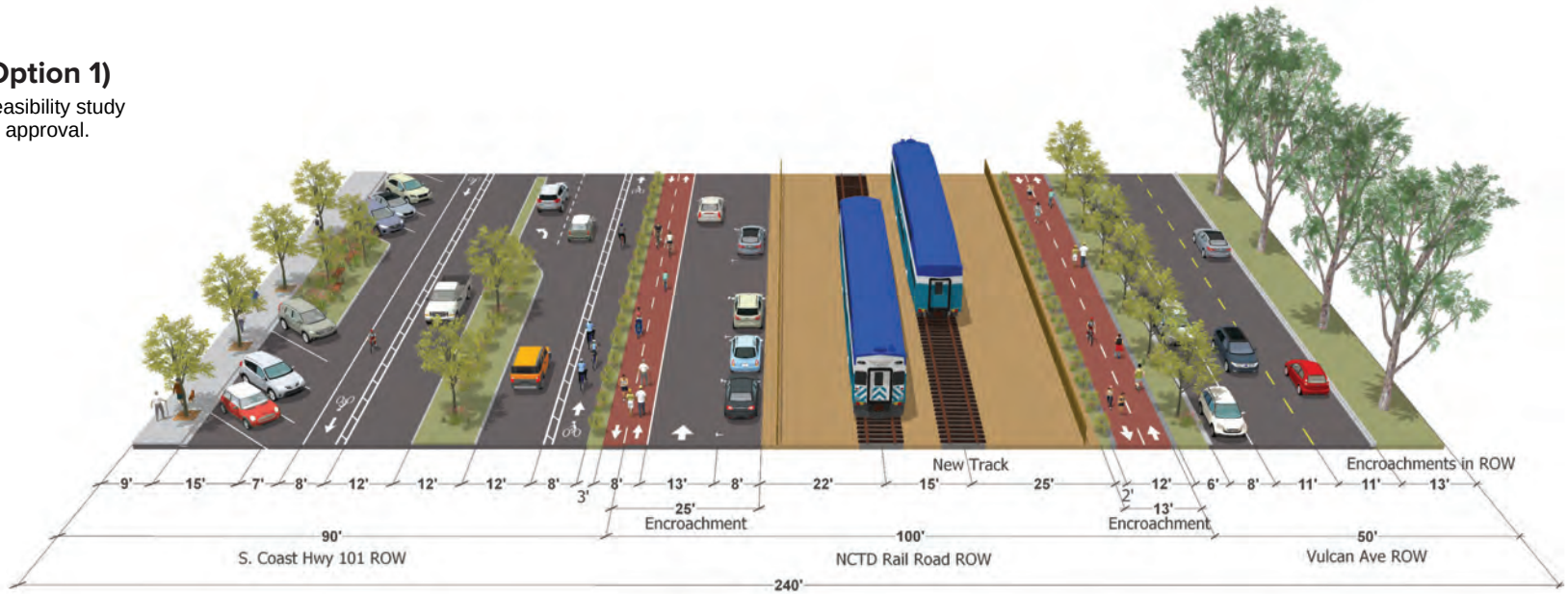
FIGURE 3-24: Bishops Gate Road Existing and Proposed Coastal Rail Trail Cross-Section

Before



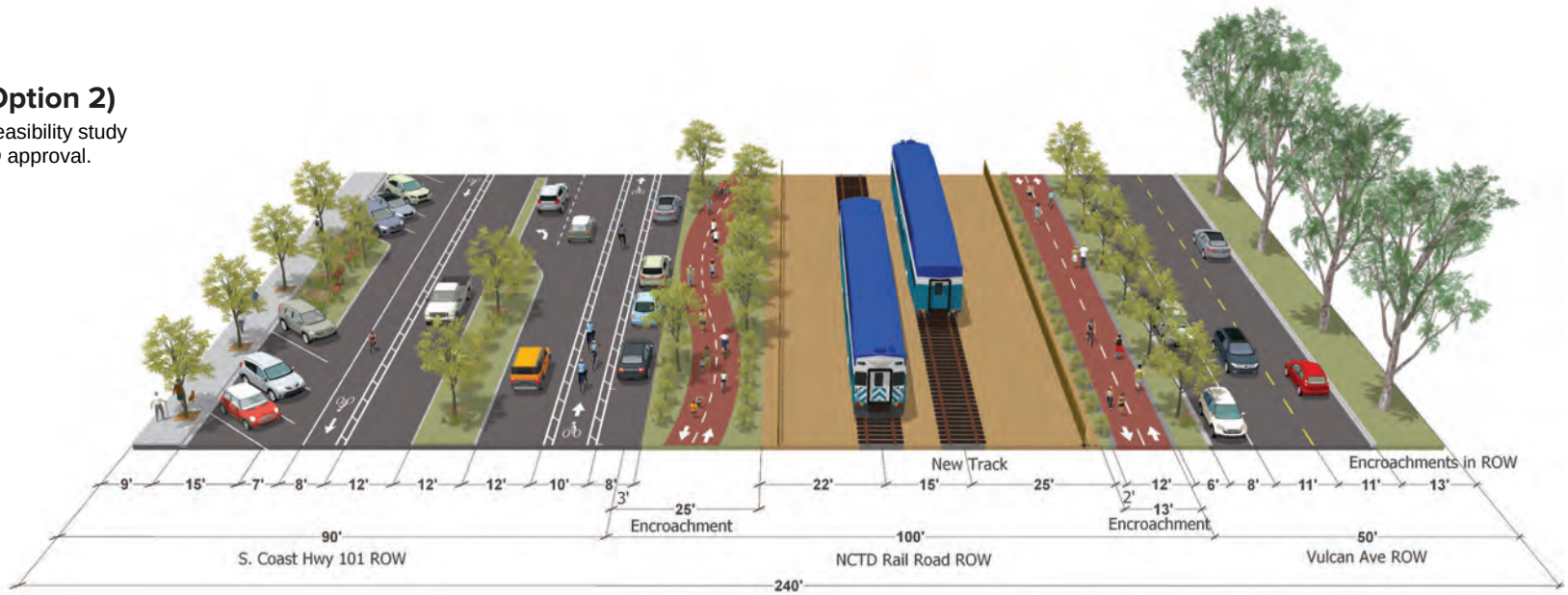
After (Option 1)

*Pending feasibility study and NCTD approval.



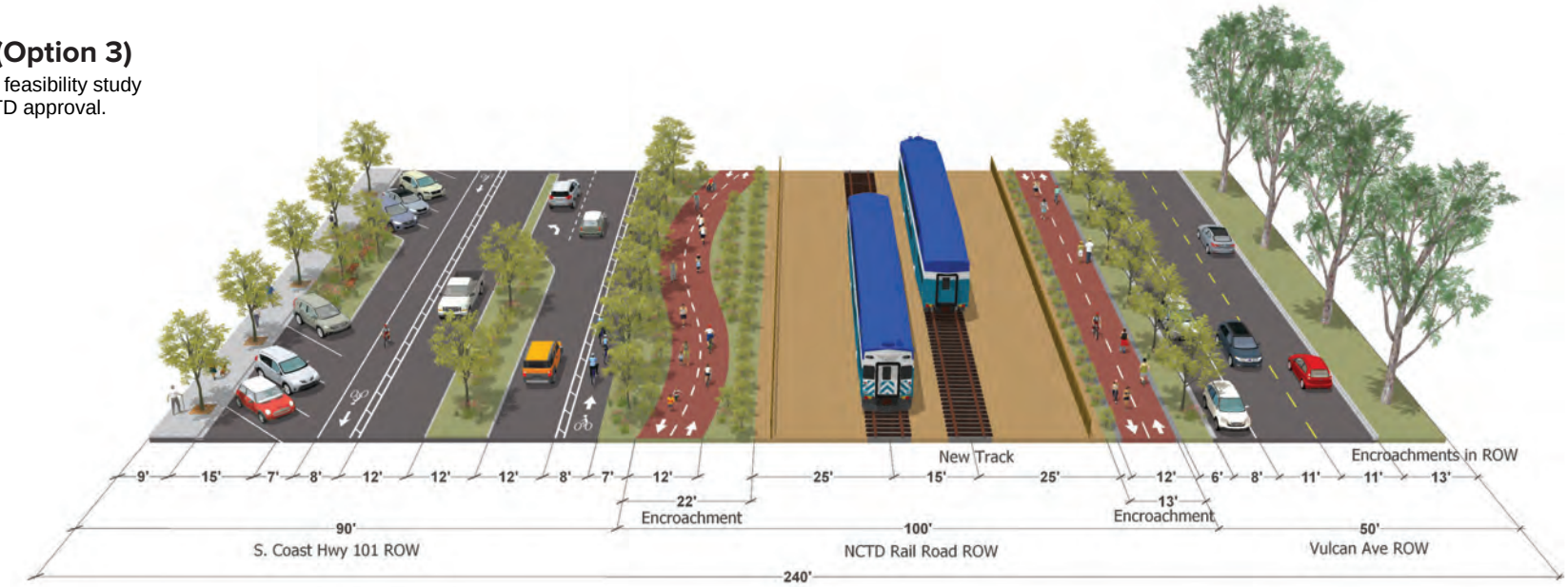
After (Option 2)

*Pending feasibility study and NCTD approval.



After (Option 3)

*Pending feasibility study and NCTD approval.



Encinitas Boulevard and Vulcan Avenue Class 1 Multi-use Paths

A high priority for the community that is also considered to be a best practice in bike and pedestrian planning, is the idea of having protected facilities that keep walkers and bicyclists physically separated from higher speed motor vehicles. Protected facilities are the number one item of interest for people that are not used to traveling with higher speed vehicles, for both increased safety perception or stress reduction. Given the increase in pedestrian and bicycle related deaths and injuries resulting from both aggressive and distracted drivers, it is easy to see why this is a top priority for those interested in riding or walking more. Another metric that can be used in determining the comfort level of a person that wants to walk or bike on a particular street is would a parent allow a child of 10-15 years of age to use the street on their own.

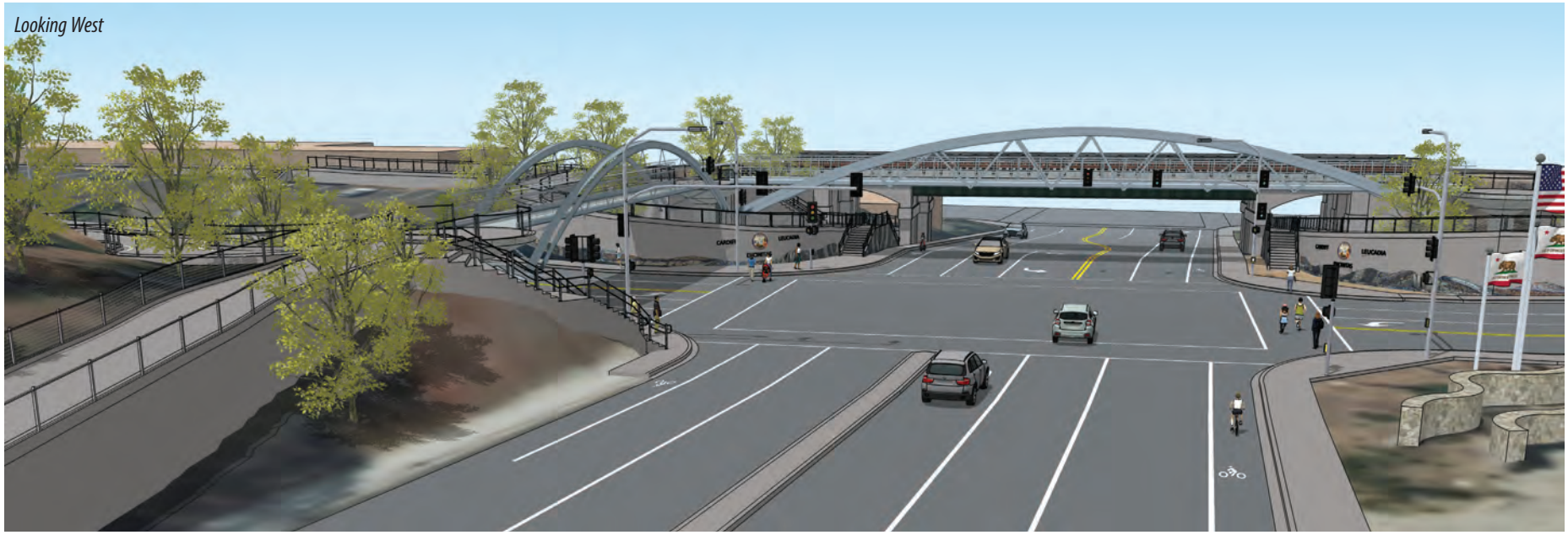
Given this high public priority and also the fact that the east side of Vulcan between East 'E' Street and Encinitas Boulevard is mostly without extensive driveways and vehicular movements off and onto the street, this side of the street makes sense to provide for a 14' wide multi-use path. The width can be accomplished by taking the 4' width of the sidewalk, and the width of the bike lane (five feet on each side) to make a 14-foot path. Additional buffer widths for a barrier (typically two to three feet) and for other miscellaneous retaining walls or other structures requiring space, will come from reducing the existing lanes down to 11 feet. In some cases, one of the lanes would need to be dropped on the northbound side of Vulcan. The sidewalk and parking can remain on the west side, whereas the bike lane would be removed on both sides. An alternative approach considered was to have this multi-use path stay on the west side of Vulcan all the way up to Encinitas Boulevard. However, the current configuration of the bus transfer center does not allow for a protected multi-use path on the west side. Unless this site is reconfigured, the east side will be required for implementation. Since the parking lane next to the Coaster Station Lot is on the west side, this alignment is preferred since switching the parking to the east side would encourage individuals parking along the street to cut across the street at a mid-block location, which would not be safe.

To make this alignment work effectively, a bridge is needed to connect the Vulcan multi-use path to the continuation of the Coastal Rail Trail. This bridge system could allow for the connection of an east-west protected multi-use path from the beach all the way to the I-5 PWP multi-use path, and potentially further to the east. The intersection becomes the crossing point of four major protected facilities that represent the most critical corridors in Encinitas. These include the Bluff Edge Coast Highway / Leucadia Streetscape paths and lanes with improved walking and bike facilities; the Coastal Rail Trail; the Encinitas Boulevard Beach to Quail Gardens Drive; and the PWP north to south multi-use path that follows the alignment of the expanded I-5 freeway. This joining of the paths at this intersection will be worth the cost in terms of improved safety, use levels, intersection capacity for vehicles, and the role these bridges play as a new gateway to the civic and commercial center of Encinitas.

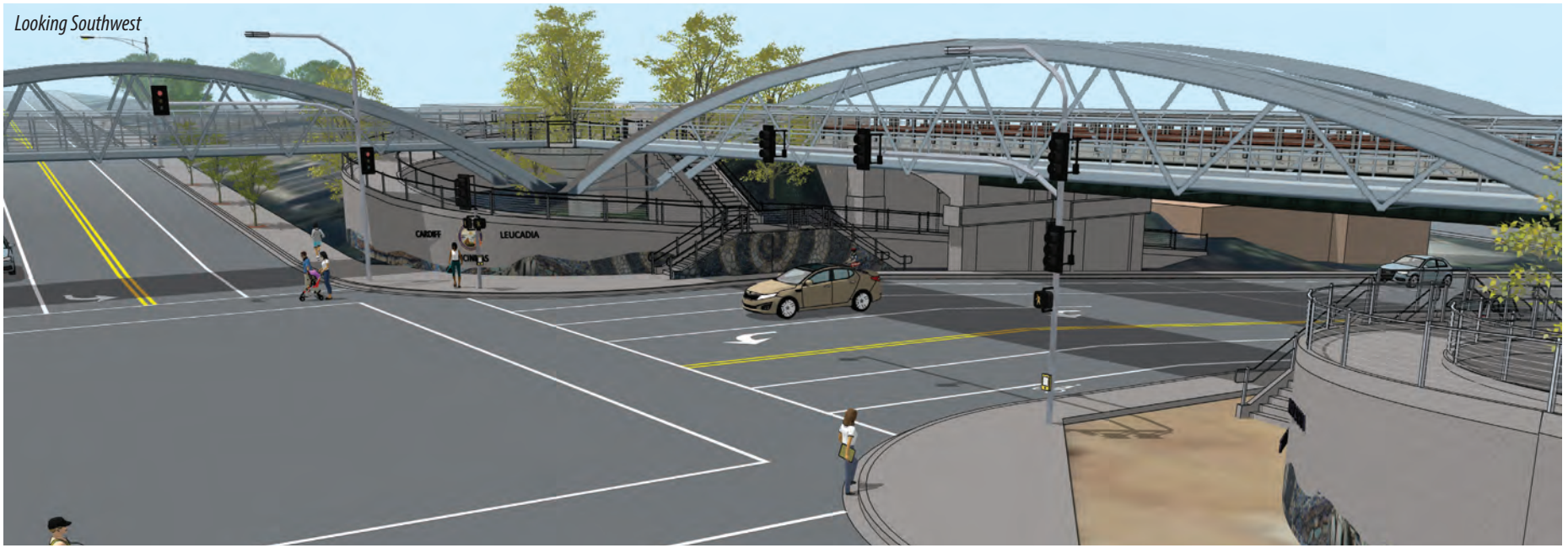
View north down Vulcan Ave at the Intersection with Encinitas Blvd

View west down Encinitas Blvd at the Intersection with Vulcan Ave

FIGURE 3-25: Encinitas Boulevard/Vulcan Avenue Bridge Illustrations



Looking Southwest



Looking West

Figure 3-25 on page 101, shows how the topography on the east side of Vulcan can be used to rise in elevation while the street drops in elevation, making a reasonable ramp work for the bridge. The second 3-D model shows how the Encinitas Boulevard multi-use path can rise to the bridge level. This model also shows how stairs can still connect to the corner, while the ramps will work for ADA access with less than an 8% slope. On page 102, the model shows how a circular ramp could connect and lead towards the beach, using the side bents of the existing rail line bridge. This model is showing a second railroad bridge being added to accommodate the double tracking of the rail line north of Encinitas Boulevard. It is possible, by coordinating with NCTD and SANDAG, that the new rail bridge could include a multi-use pathway built into the bridge, thereby eliminating the need to this second bridge for pedestrians and bikes. The model also shows how this bridge and walls could be used as a gateway with careful design treatments and landscaping.

Encinitas Boulevard/Vulcan Avenue At-Grade Crossing Options

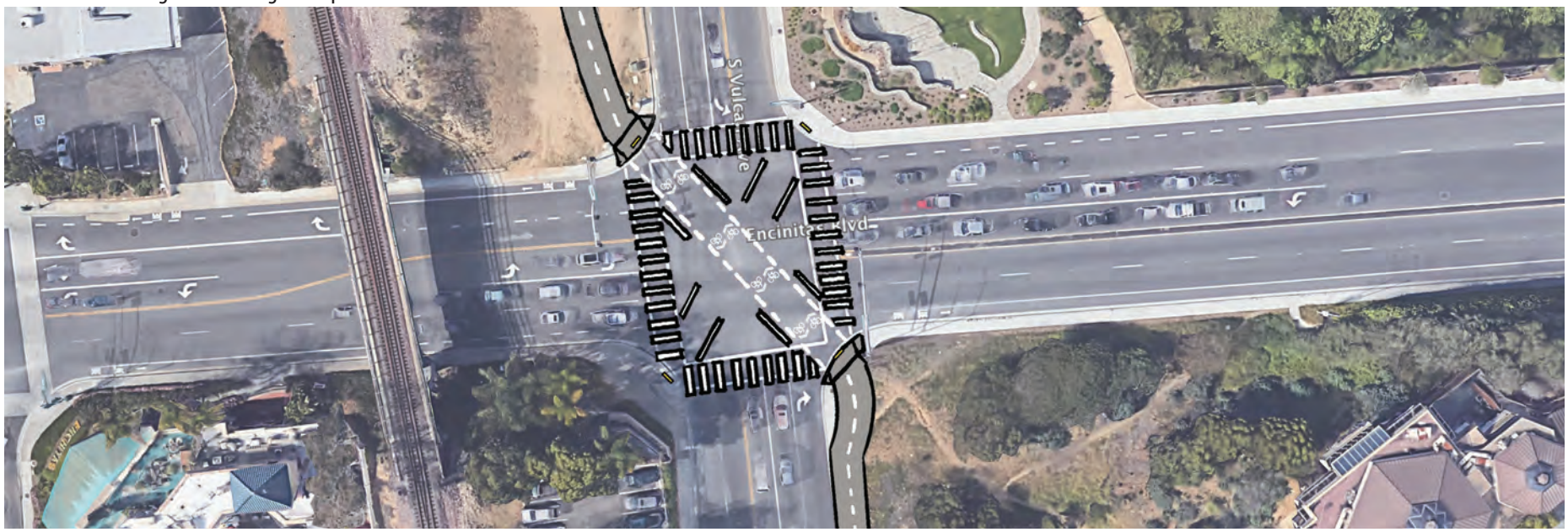
Figure 3-26 shows how the intersection could be handled with at-grade treatments, either for a temporary or permanent solution. Although there are some impacts on traffic flow, a diagonal path crossing and pedestrian scramble could be used to allow for a single signal phase. Figure 3-27

Example Diagonal Bike and Pedestrian Crossing

Typical no turn on red signs required

Typical all way movement sign required

FIGURE 3-26: Diagonal Crossing Concept for the Intersection of Encinitas Boulevard and Vulcan Avenue



shows a second at-grade concept known as a protected intersection or a Danish intersection. This can work with combined signal phasing and may be better for traffic flow, but does require a two leg crossing for bicyclists and pedestrians. This should be considered as a temporary measure, or if made permanent, appropriate levels of crossing time and pedestrian or bicyclist priority should be provided to balance with vehicular movements through the intersection.

Protected intersection diagram

FIGURE 3-27: Protected Intersection Concept for Encinitas Boulevard at Vulcan Avenue

Examples of Protected Intersections

FIGURE 3-28: Rail Corridor

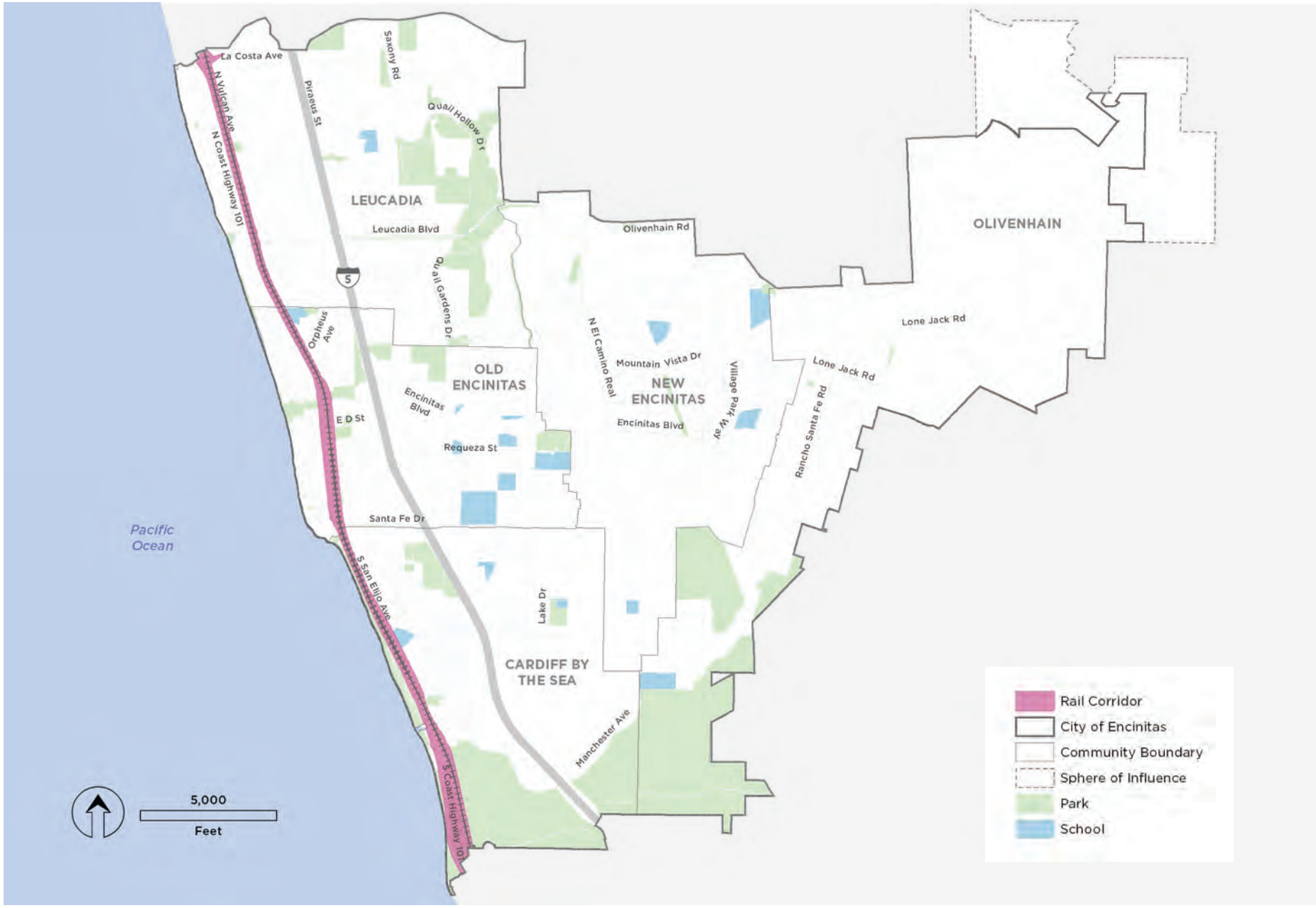
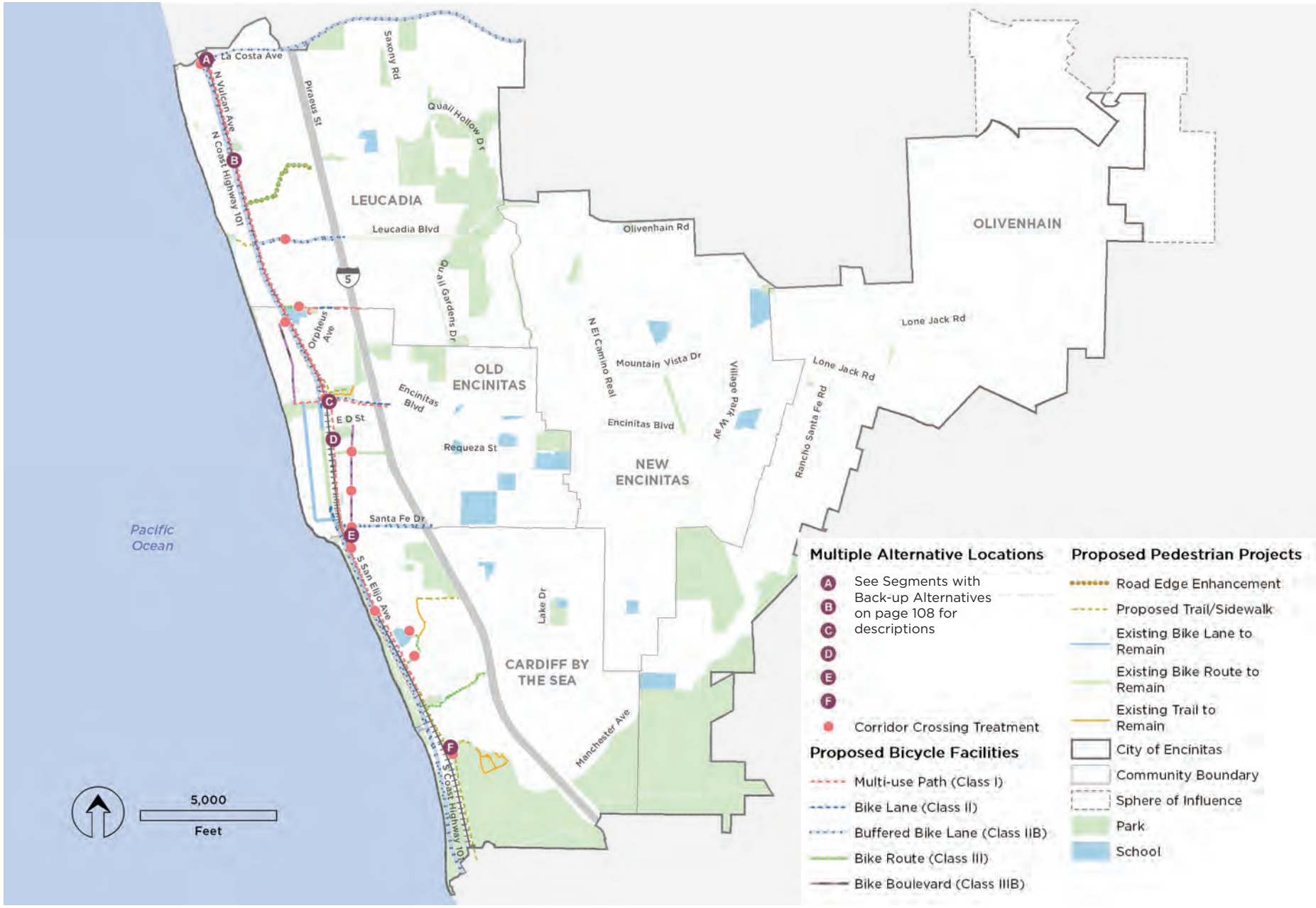


FIGURE 3-29: CRT Feeders

FIGURE 3-30: Vision Corridor Projects



Segments with Back-up Alternatives

There are multiple back-up alternative within Encinitas, as shown in Figure 3-30: Vision Corridor Projects, including:

- **A** Rebuild La Costa Avenue Bridge with multi-use path going under the north side of La Costa, OR connect walking trail to south edge of roadway with walking improvements to Coast Highway with bicycle facility routed to intersection of La Costa Avenue and Vulcan Avenue.
- **B** Multi-use path on east side of rail from Leucadia Boulevard to La Costa Avenue, OR if not possible based on LOSSAN improvements, relocate path to west of tracks/east of Coast Highway.
- **C** Multi-use path at Vulcan Avenue/Encinitas Boulevard using two pre-fab bridges, OR a pre-fab and a expanded railroad bridge, OR at-grade bicyclist and pedestrian safe crossing with vehicular turning restrictions.
- **D** Multi-use path between "E" Street and Encinitas Boulevard on east side of Vulcan Avenue, OR on west side of Vulcan Avenue if NCTD relocates/reconfigures bus transit station.
- **E** No vehicular access at San Elijo Avenue and Cornish Drive intersection with Bike Boulevard added, OR allow only northbound vehicular travel between San Elijo Avenue and Santa Fe Drive.
- **F** Pole Road Trail connected with San Elijo using new bridges across lagoon, OR east-west pathway connecting rail corridor to nature center.

Vulcan Avenue at La Costa Avenue

Vulcan Avenue at Leucadia Avenue

OTHER FACILITY IMPROVEMENT RECOMMENDATIONS

Implementation of the specific facility recommendations listed previously is intended to provide a comprehensive active transportation system that serves the entire City. However, there are other broader issues that affect system development and connectivity in Encinitas that need to be addressed. The following sections describe recommendations that should be implemented in conjunction with associated active transportation projects.

INTERSTATE 5 AND COASTAL RAIL LINE CROSSINGS

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

However, like many cities, an interstate highway presents significant connectivity problems when trying to cross the roadway. The distances between crossing points forces bicyclists and pedestrians to plan east-west trips based on available crossing locations. Even then, not all of Encinitas' interstate crossings have bikeway or walkway facilities or have conditions that make most bicyclists or walkers feel comfortable or safe. Where underpasses and overpasses do provide access, they are often narrow. Bicyclists and pedestrians are confronted with drivers making their way to and from high speed vehicular off and on-ramps. Often, multiple lanes turning across the right edge of the roadway where people walk or bicycle.

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

At the Interstate 5 freeway crossings, marked bicycle lanes should be created along the left side of right-turn-only lanes leading to freeway on-ramps. This will help to calm right-turning traffic, improve bicyclist safety, and will notify drivers that bicyclists positioning themselves between the through and the right-turn-only lanes (instead of between the right-turn-only lane and the curb) are riding legally, safely, and properly, and should be anticipated and accommodated. This new section of bicycle lane should align with any existing lanes crossing the freeway on the far side of the intersection.

In general, at augmented intersections, the rightmost through lane should be wide and the right-turn-only lane should be as narrow as possible (A good example is the eastbound Leucadia Boulevard on-ramp to southbound Interstate 5). Pedestrian accommodations should also be provided. In some cases, this could be addressed with dual-use facilities, such as Class I multi-use paths. This will generally require widening the passageway under the freeway, but this could be accomplished as part of planned interchange improvements as well.

There are two freeway crossings of Interstate 5 without on- or off-ramps at Requeza and MacKinnon Streets. Such freeway crossings are preferred locations for all bicyclists, experienced or not, as well as pedestrians. They provide safer crossings than typical interchanges because there are fewer motor vehicle turning movements and less vehicle traffic overall than at typical interchanges. However, though they provide an opportunity to avoid typical interchange traffic conditions, they can take bicyclists and pedestrians well away from their desired route. They often are spaced too far apart to be convenient to pedestrians or bicyclists.

RAIL LINE

Rail line crossings are relatively widely spaced with spans of more than a mile between some of them. There is an overcrossing at La Costa Avenue and there are undercrossings at Encinitas Boulevard and Santa Fe Drive.

At-grade crossings are at Leucadia Boulevard, D Street, and Chesterfield Drive. Undercrossings are also planned at Verdi Avenue in Cardiff-by-the-Sea and at El Portal Street near Paul Ecke Central Elementary School in Leucadia. Community input suggested additional crossings are needed, especially if the planned rail double-tracking requires fencing that will limit cross-track access.

INTERMODAL FACILITIES

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

In some cases, opportunities to increase intermodal transit use may be available simply by providing more convenient access between transit centers and bikeways and walkways where none exist. Multi-use standards should be implemented in the design of these access paths. The Coastal Rail Trail will serve this function by providing a direct access to the transit center and commuter rail station from any point along coastal Encinitas. Other routes were recommended, at least in part because they will provide better connectivity with the transit center, such as the proposed route along Encinitas Boulevard.

While the existing intermodal facility system provides a reasonable level of connection between bicycling and public transit, new facilities should continue to provide the capability to take bicycles on-board vehicles, either using exterior racks or inside vehicles, and to improve bicyclists' choice to store them at transit centers, such as in lockers. Improvements to the system may encourage more people to use their bicycles and the public transit system for commuting purposes. These improvements can include the following, many of which will also encourage more walking:

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

In addition to installing additional bicycle lockers, commuter rail stations could provide a facility housing other services such as showers and clothes lockers, bicycle repair services, and secure, weather-proof bicycle storage for commuting bicyclists. Similar "bikestations" are found at transit centers in other American cities, especially those served by commuter rail. Economy of scale helps to keep costs down since larger bike stations generally require attendants (for more information, see http://www.bikestation.org/).

Bicycle Racks

Wayfinding Signage

Pathway Lighting

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

The obvious location for a bikestation would be the downtown transit center, either government sponsored or privately sponsored. The downtown business improvement district could consider a similar arrangement as a solution to downtown parking problems. Since the transit station is also in downtown, there may be a nexus of opportunity between the private and public sectors.

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

SAFE ROUTES TO SCHOOL

In most cases, some students at any particular school will get there by bicycle or walking. Many of these children are not experienced, knowledgeable, or comfortable with bicycling on streets with motor vehicle traffic. For them, specific recommended routes should be designated to access schools from the surrounding neighborhoods they serve. These routes should utilize lightly traveled streets where riding or walking would be less likely to pose safety problems for themselves or other users. These routes should also be designed to cross arterials (or other high-volume streets) when necessary, at specific points with sufficient sight distances, crosswalks, pedestrian signals, and where appropriate, crossing guards. The students for whom these routes are designated should be encouraged to use them by making them safer.

GENERAL RECOMMENDATIONS

Besides physical improvements, there are a number of policy and program measures that can improve bicycling and walking conditions in Encinitas. Among them are bicyclist, walker, and driver education, enforcement, and bikeway maps, which are discussed in the following sections.

Education

No matter how good a community's conditions are for bicycling or walking, bicyclists, pedestrians, and drivers need to know how to safely interact with each other on the roads. Education is the key to making a transportation system safer.

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

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

Bicycle Safety Class

Helmet Giveaway

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

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

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

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

- Ride at a safe, controlled speed and in a responsible manner.
- Helmets are required for minors and are recommended for all users.
- Control your bicycle.
- Keep to the right.
- Obey directional and instructional signs.
- Bicyclists shall yield to pedestrians.
- Make your approach known well in advance. Avoid startling others. A friendly greeting is considerate and works well. A bicycle bell is also effective. Respect others by slowing down when passing.
- Respect closures and do not trespass on private property.
- Pick up litter, even if it is not yours.
- Be alert and attentive. Anticipate that other bicyclists or pedestrians may be around corners or in blind spots.

The Federal Highway Administration's (FHWA) Bicycle and Pedestrian Safety Education Resource (https://safety.fhwa.dot.gov/ped_bike/education) is an excellent resource from which to develop education programs.

Enforcement

Bicycling and walking safety education and promotion programs may reduce the need for heavy investments in enforcement. Enforcement should be viewed as another component of an education program and as an effective way to reduce the number of bicyclist and walker accidents and injuries. For example, posted speed limits should be enforced because high motor vehicle speeds make bicyclists and pedestrians feel unsafe, discourage people from bicycling or walking, and increase collision severity.

Active Transportation Map

There is a regional bikeway facility map available through SANDAG, but the City can further encourage bicycling and walking by providing its own map. This map can be developed from the information provided in this active transportation plan and updated as new facilities are implemented. This map can be distributed through local bicycle and outdoor equipment stores, schools, transit centers, and City, and other governmental offices, as well as downloadable from the City web site.