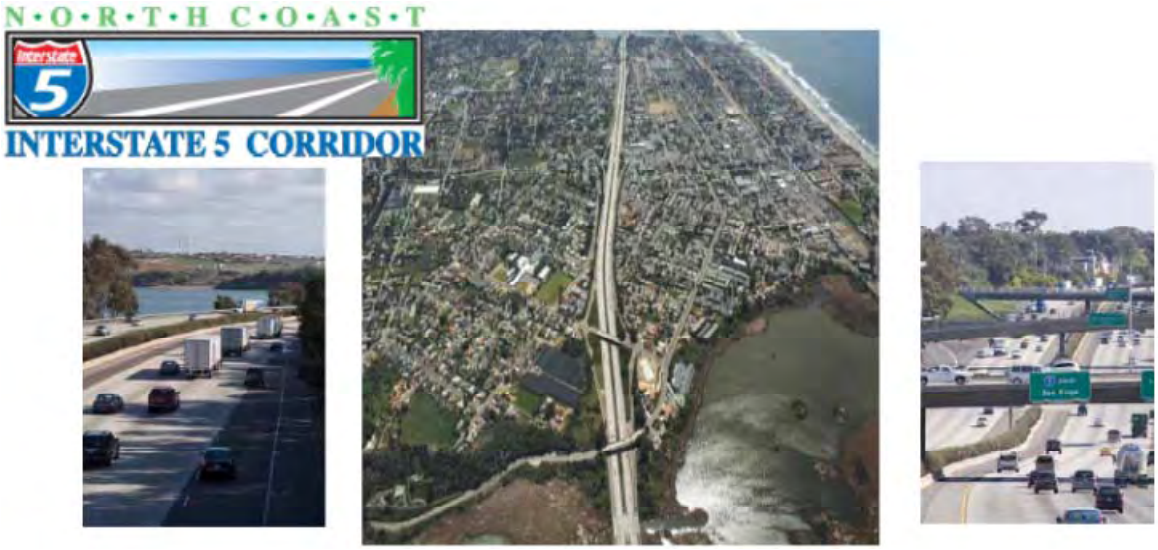
Interstate 5 North Coast Corridor Project

SAN DIEGO COUNTY, CALIFORNIA
11–SD –5 – PM R28.4/R55.4
EA 235800

Supplemental Draft
Environmental Impact Report/
Environmental Impact Statement



Prepared by
U.S. Department of Transportation
Federal Highway Administration
and
State of California Department of Transportation

August 2012

Construction of improvements to maintain or improve the existing and future traffic operations on the existing I-5 freeway in San Diego County from La Jolla Village Drive in San Diego to Harbor Drive in Oceanside/Camp Pendleton

On I-5: Post Mile (PM) to R28.4/R55.4

SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 U.S.C. 4332 (2)(C) and 49 U.S.C. 303

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

And

STATE OF CALIFORNIA
Department of Transportation

COOPERATING AGENCIES
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
U.S. Coast Guard
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
U.S. Environmental Protection Agency

RESPONSIBLE AGENCIES
California Department of Fish and Game
California Coastal Commission
California Water Quality Control Board – Region 9
California Transportation Commission
County of San Diego
City of San Diego
City of Solana Beach
City of Encinitas
City of Carlsbad

8/15/12
Date of Approval

Laurie Berman
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8/17/12
Date of Approval

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Abstract: This document is a Supplemental Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed Interstate 5 (I-5) North Coast Corridor Project. The proposed project includes improvements to maintain or improve the existing and future traffic operations on the existing I-5 freeway from La Jolla Village Drive in San Diego to Harbor Drive in Oceanside/Camp Pendleton, extending approximately 27 miles along I-5. In July 2011, Caltrans identified the 8+4 Buffer Alternative as the Locally Preferred Alternative I-5 Express Lanes. The LPA consists of two high-occupancy vehicle (HOV)/Managed Lanes in each direction, separated by a buffer from the existing four general purpose lanes in each direction. The primary reason for preparation of this Supplemental Draft EIR/EIS is to address federal and State resource agency requests for clarification of information that focuses mainly on resources at six coastal lagoons: Los Peñasquitos, San Dieguito, San Elijo, Batiquitos, Agua Hedionda, and Buena Vista. The design of proposed bridge crossings of the lagoons have been modified to enhance lagoon function, and a number of natural and human community enhancements have been developed for inclusion in the project. Potential project benefits include maintaining or improving the existing and future traffic operations along this portion of I-5, improving the safe and efficient regional movement of people and goods, improving community connectivity, improving pedestrian and bicycle facilities, improving lagoon function, and providing compatibility with regional multi-modal improvements. Please send your comments on this document to Shay Lynn M. Harrison, California Department of Transportation at the address above, no later than October 15, 2012.

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GENERAL INFORMATION ABOUT THIS DOCUMENT

What's in this document:
The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) have prepared this Supplemental Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS). The information in this document is intended to supplement the Draft EIR/EIS prepared for this project in San Diego County, California, and released for public review on July 9, 2010. This Supplemental Draft EIR/EIS summarizes project design features and discusses new information obtained from additional studies conducted at the lagoons and lagoon crossings in the North Coast Corridor. The document addresses details regarding mitigation and restoration measures for the lagoons, and includes: documentation of measures adopted to address coastal wetlands; further details about the proposed community enhancement features; information about project phasing presented and adopted in the 2050 Regional Transportation Plan (RTP); and information about a locally preferred alternative, which is consistent with California Senate Bill 468, Streets and Highways Code Sections 103 and 148.10 (Kehoe 2011).

What you should do:

- Please read this Supplemental Draft EIR/EIS. This document and the technical studies are available for review at **www.keepsandiegomoving.com/I-5-intro.html** and the following locations:

San Diego Public Library – Central
820 E Street
San Diego, Ca 92101

San Diego Public Library – Carmel Valley
3919 Townsgate Drive
San Diego, CA 92130

Del Mar Library
1309 Camino Del Mar
Del Mar, CA 92014

San Diego County – Solana Beach
157 Stevens Avenue
Solana Beach, CA 92075

Cardiff By The Sea Library
2081 Newcastle Avenue
Cardiff By The Sea, CA 92007

Encinitas Library
540 Cornish Drive
Encinitas, Ca 92024

Carlsbad Library
1775 Dove Lane
Carlsbad, CA 92011

Georgina Cole Library
1250 Carlsbad Village Drive
Carlsbad, CA 92008

Oceanside Public Library
330 N Coast Hwy
Oceanside, CA 92054

Caltrans District 11
4050 Taylor Street
San Diego, CA 92110

- Attend the public hearing:

Location:
City of Encinitas Community and Senior Center
1140 Oakcrest Park Drive
Encinitas, CA 92024

Date: Wednesday, September 19, 2012

- We welcome your comments. If you have any comments regarding the additional information presented in the Supplemental Draft EIR/EIS, please attend the public hearing and/or send your written comments to Caltrans by the deadline.

- Submit comments via postal mail to:

  Shay Lynn Harrison, Environmental Analysis Branch Chief
  CA Department of Transportation – District 11
  Division of Environmental Analysis, MS 242
  4050 Taylor Street
  San Diego, CA 92110

  Submit comments via email to**: I-5.NCC.EIR.EIS@dot.ca.gov**

- Submit comments by the deadline: **October 15, 2012**

What happens next:
After comments are received from the public and reviewing agencies, Caltrans and the FHWA may undertake additional environmental and/or engineering studies. A Final EIR/EIS will be circulated; the Final EIR/EIS will include responses to comments received on the Draft EIR/EIS and Supplemental Draft EIR/EIS, and will identify the preferred alternative. Following circulation of the Final EIR/EIS, if the decision is made to approve the project, a Notice of Determination will be published for compliance with the California Environmental Quality Act and a Record of Decision will be published for compliance with the National Environmental Policy Act. If the project is given environmental approval and funding is appropriated, Caltrans and FHWA could design and construct all or part of the project.

For individuals with sensory disabilities, this document can be made available in Braille, large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Shay Lynn Harrison, 4050 Taylor Street, San Diego, CA 92110 (MS242); (619) 688-0190 Voice, or use the or use the California Relay Service 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice) or 711.

It should be noted that at a future date FHWA may publish a notice in the Federal Register, pursuant to 23 USC §139(l), indicating that a final action has been taken on this project by FHWA. If such notice is published, a lawsuit or other legal claim will be barred unless it is filed within 180 days after the date of publication of the notice (or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the federal agency action is allowed). If no notice is published, then the lawsuit or claim can be filed as long as the periods of time provided by other federal laws that govern claims are met.

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INTERSTATE 5 CORRIDOR

Summary

SUMMARY

S.1 INTRODUCTION

This document is a Supplemental Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed Interstate 5 (I-5) North Coast Corridor Project (*I-5 NCC Project*).[1] Caltrans and the Federal Highway Administration (FHWA) propose improvements to maintain or improve the existing and future traffic operations on the existing I-5 freeway from La Jolla Village Drive in San Diego to Harbor Drive in Oceanside/Camp Pendleton, extending approximately 27 miles (PM R28.4 to R55.4) along I-5. *Figure 1-1* in *Chapter 1* shows the length of the project, identifies cities, and depicts lagoons and waterways crossed by I-5.

The information in this document is intended to supplement the Draft EIR/EIS prepared for this project and released for public review on July 9, 2010. Additional detailed studies of lagoon hydrology that were underway as referenced in the Draft EIR/EIS are now complete. The primary purpose of this supplemental document is to confirm impacts and benefits to the lagoons based on finalized studies. In addition to refining the analysis of lagoon impacts in the Draft EIR/EIS, a number of events have occurred since July 2010 that are applicable to the project; including passage of California Senate Bill 468 (CA SB 468), Streets and Highways Code Sections 103 and 149.10 (Kehoe 2011); adoption of the 2050 Regional Transportation Plan (RTP); and continued coordination with local cities and the resource agencies regarding project specifics. This Supplemental Draft EIR/EIS therefore includes: documentation of measures adopted to address coastal wetlands; further details about the proposed community and regional enhancement features; information about project phasing presented and adopted in the 2050 RTP; and information about the Locally Preferred Alternative (LPA), which is consistent with CA SB 468. Caltrans determined that the 8+4 Buffer or Express Lanes Project is the LPA under the California Environmental Quality Act (CEQA); the FHWA has not identified an LPA under the National Environmental Policy Act (NEPA). See further discussion on CA SB 468 within *Section S.3, Purpose and Need*, of this chapter. This additional information is provided for clarification, because the impacts from these items do not substantially change analysis in the Draft EIR/EIS. As a result, this Supplemental Draft EIR/EIS focuses on the lagoon crossings.

This proposed joint effort by Caltrans and FHWA is subject to both state and federal environmental review requirements. Caltrans is the lead agency under CEQA, and the FHWA is the lead agency under NEPA. FHWA and Caltrans made the decision to prepare a supplemental environmental document in accordance with regulations and guidance from NEPA in 40 Code of Federal Regulations (CFR) 1502.9, and CEQA Guidelines Section 15163 to provide updated information relevant to environmental concerns.

As indicated above, in July 2011, Caltrans identified the 8+4 Buffer alternative as the Locally Preferred Alternative (LPA), which is also known as I-5 Express Lanes. The LPA consists of two high-occupancy vehicle (HOV)/Managed Lanes in each direction, separated by a buffer from the existing four general purpose lanes in each direction. The LPA has been, and will continue to be,

[1] The full text of the Draft EIR/EIS is available at www.keepsandiegomoving.com, under the I-5 Express Lanes Project. That document contains full discussion of evaluated alternatives, anticipated impacts, and community outreach as of July 2010. The website also contains current information regarding related documents, ongoing project efforts, and relevant legislation.

refined to further reduce impacts to the human and natural environment, as well as to reflect public review comments and ongoing engineering review.

The Final EIR/EIS for the *I-5 NCC Project* will include all topics covered in the Draft EIR/EIS, and identify any changes; as well as responses to the correspondence received during public review of both the Draft EIR/EIS and this Supplemental Draft EIR/EIS. Reviewers are encouraged to comment specifically on the new information presented in this Supplemental Draft EIR/EIS. Comments already submitted on the Draft EIR/EIS are now part of the record and do not need to be resubmitted.

S.2 OVERVIEW OF THE PROJECT AREA

The project area is a portion of I-5, a principal north-south transportation facility in the western United States. I-5 is part of the National Highway System (and National Strategic Highway Network) and extends between the Mexican and Canadian borders through portions of California, Oregon, and Washington. The project area begins in the northern portion of the City of San Diego, and extends northward to the northern part of San Diego County in the City of Oceanside.

The development of additional highway transportation infrastructure in the North County coastal area is limited by the existing circulation system and urban development, as well as geographical and environmental constraints. Specifically, the majority of land directly adjacent to the highway right-of-way is developed for residential, industrial, and/or commercial uses, while a number of existing local preserves related to natural and visual resources are also present. Several drainages, including Los Peñasquitos Creek, Carmel Valley Creek, and the San Luis Rey River, cross under I-5 before terminating at the ocean. These drainages provide wildlife corridors from inland San Diego County to the coastal region. I-5 also crosses five coastal lagoons within the project limits – San Dieguito, San Elijo, Batiquitos, Agua Hedionda, and Buena Vista – and is adjacent to the eastern border of Los Peñasquitos Lagoon. These lagoons and associated waterways support a variety of habitats and wildlife, including a number of species that are both federally and State protected.

S.3 PURPOSE AND NEED

The I-5 North Coast Corridor is subject to periods of congestion that are projected to worsen over the next 40 years. The *I-5 NCC Project* is proposed to maintain or improve future conditions compared to existing conditions, in order to improve the safe and efficient regional movement of people and goods to the project design year.

This segment of I-5 was constructed through the Cities of San Diego, Solana Beach, Encinitas, Carlsbad, and Oceanside in the mid 1960s and early 1970s, with roughly two-thirds of the current daily trips in the North County coastal area occurring on it. Since original construction, traffic conditions have worsened while only minimal improvements have been constructed. Studies show the increased demand on the route is primarily due to regional population growth, increased goods movement, increased economic growth, and greater recreational and tourism demand. Growth forecasts for San Diego County and the surrounding regions show these trends will continue. As noted in the San Diego Association of Governments (SANDAG) 2050 RTP, by the year 2050, regional population is projected to grow by 36 percent. Traffic forecasting of the region shows that if no improvements are made to I-5, traffic conditions will continue to deteriorate. This would cause impacts on route operations and the ability to provide for the effective movement of people and goods through and within the region; and could have profound consequences within both the region and the State.

As stated in the Draft EIR/EIS, the *I-5 NCC Project's* main purpose is to maintain or improve the existing future traffic operations in the I-5 North Coast Corridor in order to improve the safe and efficient regional movement of people and goods for the project design year. The *I-5 NCC Project* is an integral part of the multi-modal effort to avert future conditions associated with up to 13 hours of congestion on the facility per day; which would delay the movement of goods, services, and people. As a result, the project is needed in response to: (1) local and regional congestion that has resulted from current and future (projected) regional population growth, increased goods movement, increased economic growth, and greater recreational and tourism demand; (2) the constraints of the existing roadway system, which limit the ability of the facility to operate efficiently; and (3) the need to have the corridor meet the current design standards and currently approved regional transportation plan.

Project Objectives as specified in the Draft EIR/EIS are reiterated here, with clarifications to reflect updated project construction phasing from 2030 to 2035 and the 2050 Regional Transportation Plan (RTP) that was adopted in October 2011.

- Maintain or improve future 2035 traffic levels of service (LOS) as compared to existing LOS
- Maintain or improve travel times within the corridor
- Provide a facility that is compatible with future bus rapid transit (BRT) and other modal options
- Provide consistency with the 2050 RTP where feasible and in compliance with federal and State regulations
- Maintain the facility as an effective link in the National Strategic Highway Network
- Protect and/or enhance the human and natural environment along the I-5 corridor

The proposed HOV/Managed Lanes would be managed to allow free-flow conditions, providing a more reliable travel time of approximately 24 minutes (within the 27-mile project area). This project also supports future BRT in the North Coast Corridor by allowing direct access through the direct access ramps (DARs) to the HOV/Managed Lanes; eliminating the need for buses to access the HOV/Managed Lanes through the general purpose lanes. Travel time reliability would be more assured for all HOV/Managed Lanes users, car poolers, BRT riders, and when capacity allows, paying single drivers.

Recent Legislation and Regional Transportation Planning Relevant to Purpose and Need

In 2011, CA SB 468 was signed into law as the result of a collaborative effort among State and local stakeholders. The intent of the legislation was to ensure that the needed transportation investments be completed in a balanced multimodal approach such that they do not compromise or diminish existing natural resources; including the coastal zone, flora and fauna, water quality, and unique views. CA SB 468 requires development of a Public Works Plan (PWP); published as a joint document with the Transportation Resource and Enhancement Program, or PWP/TREP) that will provide for an integrated regulatory review by the California Coastal Commission (CCC) rather than a project-by-project approval approach. The PWP is required to include all elements of the North Coast Corridor projects to be carried out by Caltrans or SANDAG, including coastal access, highway, transit, multimodal, community enhancement and environmental restoration, and mitigation projects. This has resulted in review of proposed project phasing since circulation of the Draft EIR/EIS. Other key provisions of the legislation include recommendation of an alternative no larger than the 8+4 Buffer alternative; requirement of concurrent construction of rail and highway bridge crossings over

lagoons, unless it is determined that phased construction of lagoon bridges would be an environmentally superior alternative; and requirement of construction of all or a portion of the capacity-increasing I-5 projects concurrently with multimodal projects and environmental mitigation and enhancement projects, as specified in the PWP.

During preparation of the Draft EIR/EIS, the SANDAG 2030 RTP was the approved planning document. On October 28, 2011, the 2050 RTP was adopted as the current regional transportation planning document. The 2050 RTP revenue-constrained network (i.e., those elements of the proposed network that can be built, operated, and maintained based on known current and reasonably available levels of federal, State and local funding sources projected to 2050) incorporates transit, rail, and roadway elements. SANDAG identifies this approach as the "best balance and benefits across all of the RTP goals."

The SANDAG revenue-constrained projects lists include the proposed project, and confirm that an 8+4 development scenario would be expected to address transportation planning for I-5 through the close of current SANDAG RTP planning period, consistent with the original conclusion in the Draft EIR/EIS. From the I-5 / I-805 merge north to Vandegrift Boulevard in the City of Oceanside, the proposed facility is shown with existing general purpose freeway lanes (ranging in number from 8 to 14, depending on segment), as well as the 4 HOV/Managed Lanes proposed by the LPA. No new general purpose lanes are proposed beyond those already in place. In segments with existing HOV lanes, those lanes would be converted to HOV/Managed Lanes, and where nothing beyond the general purpose lanes currently exists, four HOV/Managed Lanes would be installed. These improvements would support future regional planning related to rapid transit and are consistent with currently planned rail improvements.

S.4 PROPOSED PROJECT

As detailed in the Draft EIR/EIS, four build, and one No Build, alternatives were proposed as possible actions. Each of these alternatives is summarized below, after discussion of design features and community enhancements common to all build alternatives. Additional information provided in the document for community enhancements and regional enhancements are included for clarification. The impacts from these items do not substantially change analysis in the Draft EIR/EIS. Changes to these features since circulation of the Draft EIR/EIS are summarized under "Design Revisions" in the discussion below. Locations for primary project features, such as HOV/Managed Lanes, DARs and auxiliary lanes, are shown on *Figures 2-2.7a* through *2-2.7c, I-5 NCC Project Configuration* of this document. Locations of community and regional enhancements are shown on *Figures 2-3.1a* through *2-3.1c.*

Design Features Common to All Build Alternatives

All build alternatives would have the following design elements:

- One HOV/Managed Lane in each direction from La Jolla Village Drive to just north of Lomas Santa Fe Drive
- Two HOV/Managed Lanes in each direction from just north of Lomas Santa Fe Drive to Harbor Drive/Vandegrift Boulevard
- Separation of general purpose lanes from HOV/Managed Lanes from near La Jolla Village Drive to Del Mar Heights Road, and from State Route 78 (SR-78) to near Harbor Boulevard, by a buffer varying in width up to five feet

- Provision of a continuous HOV lane in each direction through the I-5 / I-805 junction with a freeway-to-freeway connector (flyover), crossing over the I-5 / I-805 merge and connecting the proposed project HOV/Managed Lanes to existing HOV lanes just north of that merge
- DARs from grade-separated interchanges into Managed Lanes, thereby allowing direct access to the HOV/Managed Lanes without weaving across general-purpose lanes at Voigt Drive and Manchester Avenue. The DARs are compatible with carpools, bus transit, and value pricing, and would support HOV/Managed Lanes. Both of these facilities have also been redesigned since circulation of the Draft EIR/EIS to minimize environmental impacts
- Intermediate access points (IAPs) or at-grade access located near Carmel Mountain Road, Del Mar Heights Road-Via de la Valle, Lomas Santa Fe Drive, Santa Fe Drive, Poinsettia Lane, Tamarack Avenue, and Oceanside Boulevard; and access points at the ends of HOV/Managed Lanes at La Jolla Village Drive and Harbor Drive
- Intelligent Transportation System (ITS) components, such as toll collection equipment, to allow single-occupancy vehicle users to purchase use of HOV/Managed Lanes (including overhead suspended scanner devices such as gantries, traffic monitoring stations, ramp meters, closed circuit television [CCTV] to view traffic on the facility and to help manage the traffic, changeable message signs [CMSs] to display the tolls, and loop detectors to measure traffic volume and speed)
- Twelve-foot-wide auxiliary, acceleration, and deceleration lanes (as needed in 14 locations; 5 southbound, 4 northbound, and 5 both north- and southbound) and 10- to 12-foot-wide shoulders
- New park and ride facilities at Manchester Avenue and State Route 76 (SR-76), and enhanced park and ride facilities at other locations
- Reconfiguration of various local interchanges to improve vehicular, pedestrian, and bicycle circulation at northbound ramps for Leucadia Boulevard and La Costa Avenue; at southbound ramps for Roselle Street, Manchester Avenue, Encinitas Boulevard, Palomar Airport Road and Oceanside Boulevard; and at both north- and southbound ramps at Genesee Avenue, Del Mar Heights Road, Via de la Valle, Birmingham Drive, Santa Fe Drive, Tamarack Drive, Carlsbad Village Drive, Mission Avenue, SR-76, and Harbor Drive, as detailed on *Table 2.1* of the Draft EIR/EIS
- Redesign of lagoon bridges at Los Peñasquitos, San Dieguito, San Elijo, Batiquitos, Agua Hedionda, and Buena Vista lagoons, with a minimum width of 194 feet (97 feet on either side of centerline)
- Ramp metering at various on-ramps (with ultimate metering at all 58 on-ramps at buildout), retaining walls (to reduce property acquisition needs, stabilize slopes, minimize impacts, and accommodate engineered structures), barriers, guard rails/end treatments, crash cushions, bridge rails, and signage, installed as appropriate and as needed
- Project-related drainage abandonment or improvement including extension, replacement, or lining, with new drainage facilities constructed adjacent to cross roads (facility examples include storm drain inlets, storm ditches, rock slope protection, and headwalls)
- Relocation of existing overhead or underground utilities (water, sewer, gas, electricity telephone, and other communications), as needed and within existing utility easements, as possible
- Proposed sound barriers as described in the Draft EIR/EIS with specifics dependent on final design

Bridges

As a result of optimization review of the coastal lagoon crossings, changes have been identified for I-5 bridge design. New bridges are now proposed at Agua Hedionda, San Elijo, Batiquitos, and Buena Vista Lagoons, with longer bridges proposed at the latter three lagoons. As noted, the proposed bridge lengths are recommended as a result of bridge length optimization review, with specific studies identified and summarized in *Chapter 3, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures*, of this document. These longer bridges are included in the project as an enhancement component as the longer lengths are not required for improved traffic management, but are proposed solely for the purpose of enhanced lagoon function or for biological benefit. Refinements in bridge widths also have been provided for the LPA.

Community and Regional Enhancements Common to All Build Alternatives

Community enhancements were developed in conjunction with the local cities and would be implemented during project construction as long as maintenance agreements are in place. Following public comments received on the Draft EIR/EIS, as well as continued agency and city coordination, enhancements previously proposed were eliminated from current proposals for the following two community enhancements. These include the Nature Center at La Costa Avenue and associated southern trail, and Chestnut Avenue street enhancements. Currently proposed community enhancements include pedestrian, bicycle, park and ride, gateway, streetscape, and park enhancements (all listed on *Table 2.2.2* in *Chapter 2, Purpose and Need and Project Description*, of this document). The “North Coast Bikeway” (NC Bikeway) also has been added as a regional enhancement (see *Table 2.2.3.* This bikeway would complement the “Coastal Rail Trail” and the “El Camino Bicycle Corridor,” as well as the “California Coastal Trail.” For all build alternatives, inclusion of the community and regional enhancements is dependent upon reaching a maintenance agreement with the appropriate jurisdiction. The proposed community enhancements have undergone analysis to evaluate their environmental impacts.

Other Common Features

The project includes numerous individual design elements, including ramp meters, utility relocations, noise barriers, retaining walls, drainage and water treatment features, auxiliary lanes, and signage. Because the majority of these features would be located within areas required for modification as part of the I-5 through lanes footprint, they would not, in and of themselves, result in substantial environmental impacts. Features common to all alternatives that would individually result in potentially substantial environmental impacts include bridges, braided ramps, DARs, and certain auxiliary lanes. Bridges are described in *Chapter 2*, with discussion of potential benefits and impacts associated with them addressed in *Chapter 3*. Specific identification of DAR, braided ramp, and auxiliary lane features; justification for their proposed inclusion in the project; and proposed avoidance, minimization, and mitigation measures, are summarized in *Tables 2.2.4* through *2.2.6*, respectively.

Design Revisions

In addition to consideration of what project improvements are actually needed along the I-5 corridor, the potential for minimizing or avoiding impacts has also been an ongoing process. Throughout project design, the project development team has been reviewing opportunities for avoidance and minimization of potential project impacts. This has included reduction of right-of-way requirements through shifts in facility location as well as redesign, and in some cases, even

elimination of potential project features. Elements taken into consideration included each of the major project elements (bridges, auxiliary lanes, and DARs).

Specifically, following circulation of the Draft EIR/EIS, the Manchester DAR was redesigned to eliminate an overcrossing and integrate a DAR undercrossing, substantially reduce proposed parking, and commit to pervious hardscape. Two other DARs, located at Cannon Drive in the City of Carlsbad and Oceanside Boulevard in the City of Oceanside were eliminated from the proposed project. As noted above, proposed bridge lengths have been revised as an enhancement component to optimize lagoon function. Improvements to wildlife crossings and pedestrian/bike facilities have been further clarified and incorporated into project design. These substantial changes to project features are summarized in *Table S.1*, below, and discussed in more detail in *Chapter 2* of this document. The result of these changes has been to reduce the impacts of the proposed project and to confirm the conclusions in the Draft EIR/EIS

Project Design Measures to Benefit Regional Air Quality

One of the key objectives of the *I-5 NCC Project* is to improve the efficient regional and interregional movement of people and goods, minimizing future conditions associated with substantial gridlock on the facility. Improvement of traffic flow, along with provision of improved bike/pedestrian facilities as community enhancements, would improve regional air quality once in operation. As a result, even considering the potential for increased freeway travel (latent demand), the project would be consistent with regional air quality conformity goals. Potential construction air quality impacts would result from construction activities associated with segment widening, mainline bridge construction, and overcrossing/undercrossing construction. In addition, minimal air quality impacts could occur from construction of the proposed community enhancement projects. Such construction would not have a substantial impact on air quality.

Over time, the reductions in air quality impacts through reduction in traffic congestion would be partially offset by the increase in the number of vehicles using the roadway. Given the forecasted population growth (an additional one million people by 2040) in the region, traffic projections indicate that Vehicle Miles Traveled (VMT) on I-5 will increase approximately 29 percent over the next 30 years, even if capacity is not increased on I-5. With the addition of the four (maximum) express lanes, VMT is expected to increase an additional four percent above “no-build” projections, due to the potential for the project improvements to induce people to travel I-5 who would not otherwise do so (“latent demand”). The projected increase of VMT for the build alternatives is relatively small as a result of a number of regional and project strategies/improvements designed to reduce the growth of VMT, and to encourage options to the use of single-occupant vehicles (the majority of the HOV/Managed Lane users would be HOVs or transit users). The *I-5 NCC Project* also includes a number of operational and transportation system management improvements designed to maximize the efficiency of the existing system and to provide improved traveler information. The four percent VMT increase related to latent demand would be more than balanced by the reduced congestion resulting from increased vehicle speeds and decreases in VMT on local arterials.

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Table S.1
DESIGN REFINEMENTS SINCE CIRCULATION OF THE DRAFT EIR/EIS

Design Feature	At Circulation of the Draft EIR/EIS	Feature Refinement Since Circulation of the Draft EIR/EIS
Direct Access Ramps Cannon Drive DAR	Included	Deleted per local jurisdiction, which is continuing to evaluate a range of planned land uses at this interchange, as well as available funding sources
Oceanside Boulevard DAR	Included	Deleted per local jurisdiction, which is continuing to evaluate a range of planned land uses at this interchange
Manchester Avenue DAR	Included	Flyover deleted and undercrossing incorporated to minimize impacts, parking lowered to 150 plus 7 disabled accessible spaces
Bridges at Lagoons[1] San Elijo	Bridge 370 feet long and 252.9 feet wide. Gap between two bridges filled for single span. Channel bottom width of 130 feet, depth of -6.0 feet, and 2:1 slopes	Bridge 603.1 feet long and 288 – 353.6 feet wide. Channel bottom 261 feet wide and -6.0 to -6.5 feet deep. Total change from existing conditions of 263.1 feet in length, and 130.5 – 196.1 feet in width. Channel bottom widened by approximately 131 feet, deepened by approximately 0.5 foot, and channel slope changed from 1:1 to 2:1
Batiquitos	One bridge 246 feet long and 226 feet wide. Channel bottom width of 106 feet, depth of -5.3 feet, and 2:1 slopes	Two bridges 282 feet long and each 122 feet wide. Channel bottom 183.5 feet wide and -7.0 feet deep. Total change from existing conditions of 63 feet in length, and two bridges rather than one span, each 54 feet wider than existing. Channel bottom widened approximately 77.5 feet, deepened by 1.7 feet
Buena Vista	Bridge 131.2 feet long and 252.9 feet wide. Channel bottom width of 50 feet (estimated), depth of -2.0 feet, and 2:1 slopes	Bridge 197 feet long and 336 feet wide. Channel bottom 105 feet wide (estimated) and -6.0 feet deep, with 2:1 slopes. Total change from existing conditions of 94.6 feet in length, and 152 feet in width. Channel bottom widened approximately 81 feet, deepened by approximately 4.0 feet, and slope change of 0.5:1

Table S.1 (cont.)
DESIGN REFINEMENTS SINCE CIRCULATION OF THE DRAFT EIR/EIS

Design Feature	At Circulation of the Draft EIR/EIS	Feature Refinement Since Circulation of the Draft EIR/EIS
Auxiliary Lanes Between Lomas Santa Fe Drive and Manchester Avenue (NB)	Included as extending across San Elijo Lagoon and terminating south of Manchester Avenue	This auxiliary lane would terminate prior to San Elijo Lagoon as additional length would not improve weaving facility
Between Via de la Valle and Manchester Avenue	Previously terminated prior to Lomas Santa Fe off-ramp	The auxiliary lane would cross Lomas Santa Fe to improve weaving facility
Between Poinsettia Lane and Palomar Airport Road (NB and SB)	Included as a SB acceleration/NB deceleration lane	The SB lane would extend to the Poinsettia Lane SB off-ramp. The NB lane would extend to start at the Poinsettia Lane NB on-ramp
Highway Patrol Feature California Highway Patrol Outlet at Cannon Drive	Not included	Cross-over/turnout provided so emergency vehicles could change between north- and south-bound I-5 lanes
Regional and Community Enhancements[2] Del Mar Heights Pedestrian Overpass Connection	Extended west of I-5 right-of-way to connection near elementary school	The overcrossing would connect to the North Coast (NC) Bikeway within Caltrans right-of-way
Nature Center at La Costa Avenue and Associated Southern Trail	Included	Deleted due to potential for impacts to sensitive resources
Chestnut Avenue Street Enhancements	Included	Deleted as a Community Enhancement and incorporated into project design
NC Bikeway	Not included	Opportunity seen to support non-motorized transportation. Building portions within Caltrans right-of-way in the North Coast Corridor

1. Refinements to bridge design between the Draft EIR/EIS and the current document are based on Bridge Optimization Studies discussed in *Chapter 3*.
2. Refinements to regional and community enhancements between the Draft EIR and the current document are based on ongoing coordination with the cities where the enhancements would be located as well as the Batiquitos Lagoon Foundation.

Build Alternatives

Four build alternatives were described in the Draft EIR/EIS. These alternatives proposed:

- Up to 10 general purpose lanes (lanes available to all users of the facility) where fewer lanes currently exist
- Two managed lanes (lanes restricted to vehicles, motorcycles and buses with multiple passengers or to single passengers paying an access fee) going both north and south
- Auxiliary lanes (to eliminate weaving) as necessary
- Use of permanent barriers or open buffers between the general purpose and HOV/Managed Lanes

Costs for the build alternatives identified below are consistent with those presented in the Draft EIR/EIS. These costs will be verified prior to completion of the Final EIR/EIS; at which time costs will also reflect refined design for the LPA, including the elimination of two DARs.

10+4 Barrier

The 10+4 Barrier alternative would build one general-purpose lane in each direction on I-5 from south of Del Mar Heights Road in San Diego to SR-78 in Oceanside. Two HOV/Managed Lanes would be built in each direction from north of the I-805 / I-5 freeway-to-freeway connector in San Diego to Harbor Drive/Vandegrift Boulevard in Oceanside. This alternative would separate HOV/Managed Lanes from general-purpose lanes with a concrete barrier for most of its length, and a variable buffer in lieu of a barrier from Voigt Drive to Del Mar Heights Road and from SR-78 to Harbor Drive/Vandegrift Boulevard. The projected cost (right-of-way, support, and construction) for this alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $4.3 billion.

10+4 Buffer

The 10+4 Buffer alternative would add the same number of through lanes (one general purpose and two HOV/Managed in each direction) and function similarly to the 10+4 Barrier alternative, but would use a painted buffer to separate HOV/Managed Lanes from general-purpose lanes for the entire length of the project. The projected cost (right-of-way, support, and construction) for the alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $3.5 billion.

8+4 Barrier

The 8+4 Barrier alternative would not add any general purpose lanes to the existing highway. Two HOV/Managed Lanes would be added in each direction, separated from general purpose lanes as described above for the 10+4 Barrier alternative. The projected cost (right-of-way, support, and construction) for this alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $4.1 billion.

8+4 Buffer

The 8+4 Buffer alternative would not add any general purpose lanes to the existing highway. It would function similarly to the 8+4 Barrier alternative but would separate HOV/Managed Lanes from general-purpose lanes with a variable painted buffer for the entire length of the project.

The projected cost (right-of-way, support, and construction) for this alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $3.3 billion.

Phasing of Build Alternatives

Phasing of the proposed project has been reviewed and refined following circulation of the Draft EIR/EIS.

Critical to project scheduling is the overall implementation framework that coordinates the timing of rail, highway, and resource-enhancement project components. Consistent with CA SB 468, this would ensure that I-5 improvements do not outpace other multi-modal transportation improvements planned for the I-5 North Coast Corridor as discussed in *Chapter 1*, and that proposed transportation improvements do not outpace natural resources restoration and enhancement, as detailed in Chapter 6.0 of the project PWP/TREP. Project impacts would not occur in advance of project mitigation – mitigation would occur prior to or concurrent with impacts. (Please see *Sections 3.1.2* and *3.1.3* of this document for detail on phasing of project elements with regard to lagoon crossings and mitigation implementation prior to impact actions.) Elements by phase are consistent with the 2050 RTP and are depicted on *Figures 2-3.1a* through *2-3.1c*.

The current plan anticipates construction beginning as early as 2014, with completion of all project elements by 2035.

No Build Alternative

Proposed project improvements consisting of the four HOV/Managed Lanes, DARs, IAPs, auxiliary lanes, drainage upgrades, bridge improvements, community enhancements, etc., would not be constructed under the No Build alternative. The existing general purpose lanes (generally four in each direction) and the configuration of most of the intersections along the corridor would remain in their current condition. Routine maintenance would continue. Although proposed project improvements would not be implemented, a number of interchange/operations/rail projects separately proposed and cleared under other CEQA/NEPA environmental documents potentially would move forward.

Without the proposed additional through lanes on I-5, however, the anticipated increase in traffic volumes would be expected to result in additional congestion with longer delays and associated environmental impacts. Proposed improvements related to pedestrian and bike paths would not occur. Similarly, improvements to the planned transit system would not be supported without the project DARs and Managed Lanes. The No Build alternative, therefore, would not meet the project's purpose and need.

S.5 IDENTIFICATION OF THE LOCALLY PREFERRED ALTERNATIVE

The LPA is the 8+4 Buffer alternative. As documented in the Draft EIR/EIS, that alternative requires less right-of-way, and would result in the least or lowest impacts of all the build alternatives for the issues of:

- Park and recreational facilities
- Farmland
- Floodplain effects related to roadway widening, fill slopes, and bridge column impacts into waterways

- Sensitive species' critical habitat
- Permanent effects to sensitive upland habitats
- Permanent effects to sensitive wetland habitats (including eelgrass)
- Permanent effects to jurisdictional waters
- Sensitive individual plants
- Section 4(f) resources
- Residential and business displacement
- Increase in impervious area

This alternative also would allow the largest available space for water quality treatment. Locations of proposed noise barriers (ultimately dependent on final design, reasonableness allowance, and residents' acceptance) are unchanged from those shown in the Draft EIR/EIS.

As noted above, the LPA (right-of-way, support, and construction in 2010 dollars) was projected to cost approximately $3.3 billion. Updated and verified costs reflecting refined design for the LPA, including the elimination of two DARs, will be provided in the Final EIR/EIS.

S.6 PROJECT IMPACTS

The primary purpose of this Supplemental Draft EIR/EIS is to confirm impacts and benefits to the lagoons based on studies completed following circulation of the Draft EIR/EIS. In addition to refining the analysis of lagoon impacts presented in the draft document, the supplemental also clarifies changes that have occurred since circulation of the Draft EIR/EIS; focusing on updates *to I-5 NCC Project* design for I-5 crossings of the coastal lagoons and related waterways in the study area. The five lagoons (San Dieguito, Agua Hedionda, San Elijo, Batiquitos, and Buena Vista) and/or waterways (e.g., creeks draining to Los Peñasquitos Lagoon) crossed by the proposed project are individual elements of a regional coastal drainage system. Lagoon water movement (including eastward flow of sea water, western flow of fresh water, and capacity for the lagoons to accommodate tides and storm events) is individual to each lagoon, but also forms one part of the overall drainage system along this portion of the coast. The constituents (elements comprising the "make up," or nature) of each lagoon are based primarily on the extent to which waters are free flowing or stagnant. This water flow directly affects the type and quality of habitat provided for lagoon-dependent wildlife, as well as how well the lagoons function for passive recreational purposes.

In addition to lagoon health and function, an important element of the project is whether the I-5 crossing of the lagoon would be adversely affected by east-to-west flood waters or west-to-east sea level rise as well as whether I-5 would impact flood water or sea level rise flows under the bridge. The analyses in *Chapter 3* address flood plain issues and review the amount of freeboard (i.e., the distance between the bottom of the bridge and the highest elevation of 100-year storm event combined with an assumed 4.5-foot increase in sea level by Year 2100).

Updated information addresses analyses undertaken to identify optimal bridge lengths and related features (specifically, the optimal bridge length is the length beyond which any increase would result in only minimal benefits relative to the associated additional cost). Two of the six existing lagoon bridges (near Los Peñasquitos and crossing San Dieguito Lagoons) are relatively new with minor changes that do not require replacing the existing bridge. The remaining four lagoon bridges would be replaced due to the age of the existing bridge and increased width required for the project; including the I-5 crossings at San Elijo, Batiquitos, Agua Hedionda, and Buena Vista Lagoons. Studies at Agua Hedionda Lagoon, including review of existing constraints and

maintenance, however, showed no substantial benefit to tidal or fluvial flows resulting from a wider channel. Therefore, although the existing bridge represents a constriction, it was determined to be an appropriate length and would be replaced at its current length. Bridges at San Elijo, Batiquitos, and Buena Vista Lagoons were identified as potentially posing more substantial constrictions, with a potential for optimization, and additional studies were undertaken to identify how the replacement bridges and modified channels could be designed to optimize tidal and fluvial flows. In addition, proposed I-5 crossings at San Elijo and Buena Vista Lagoons are designed so that they would not restrict the range of large-scale restoration alternatives currently being considered.

Los Peñasquitos Lagoon

I-5 does not cross Los Peñasquitos Lagoon proper, but does cross waters flowing into the lagoon in three locations: Carmel Creek at the north end of the lagoon, and Los Peñasquitos and Soledad Creeks southeast of the lagoon. The lagoon is also rimmed by urban uses, including local roadways, parking facilities, and residential/commercial development. Four major north-south transportation facilities cross Los Peñasquitos Lagoon west of I-5, including one crossing by the Coast Highway and three rail crossings, all of which result in existing downstream constraints. As a result, the lagoon currently suffers from restriction of water flow.

The proposed I-5 bridge over Carmel Creek needs to be widened by only 15 feet on the western side of the bridge to accommodate the second southbound HOV/Managed Lane. Los Peñasquitos Creek and Soledad Creek would be crossed by an HOV/Managed Lanes flyover bridge added to I-5 at the I-5 / I-805 merge. The old Sorrento Valley Road crossing of Carmel Creek would be replaced with an upgraded bike/pedestrian trail, construction of new bioswales, and replacement of existing culverts with a bridge.

The minimal widening of the current I-5 bridge over Carmel Creek, along with the HOV connector/flyover bridge over Los Peñasquitos and Soledad Creeks and replacement of the box culverts on Sorrento Valley Road, would result in negligible impacts to waters of the U.S. and State wetlands. No federally or State-listed threatened or endangered species have been identified within the I-5 construction footprint at these locations, and none is expected to be impacted. There is a potential for noise/vibration impacts to bird species as a result of pile driving during bridge footing construction. Wandering skipper butterfly surveys are also required. The trail proposed under I-5 and the new bike bridge at Old Sorrento Valley Road would enhance wildlife movement opportunities in the area.

The existing I-5 bridges are upstream of effects associated with tidal circulation, erosion, and scour. One-hundred year surface flows are constricted. The existing bridge length functions during normal conditions, however, and periods for which “back up” could occur under 100-year storm events combined with high sea level rise, are considered to be of short duration and can be accommodated. Existing design is functional and the bridges are appropriate lengths for Los Peñasquitos Lagoon. No change is proposed from the I-5 bridge design (length, width, or footings) proposed in the Draft EIR/EIS.

San Dieguito Lagoon

Several north-south transportation facilities cross the San Dieguito River Valley and lagoon system, resulting in constriction points on flood flows and sediment transport. From west to east, these facilities include the Coast Highway, railroad bridge, Jimmy Durante Boulevard Bridge, and finally the I-5 bridge. The existing I-5 bridge that crosses San Dieguito Lagoon is

approximately 650 feet long and 179 feet wide, with approximately 140 feet of the total span occurring over the flowing river channel bottom. A large San Dieguito Lagoon restoration project is underway, with the goal to restore tidal wetlands and improve tidal flushing. The restoration project was modeled and planned to accommodate the existing I-5 bridge span and channel dimensions. The *I-5 NCC Project* proposes to maintain the existing auxiliary lanes across the lagoon and widen the existing San Dieguito Lagoon bridge by 79 feet rather than replace the bridge. A new bike/pedestrian path would be suspended from the I-5 bridge at the lagoon crossing.

Vegetation community impacts from freeway bridge widening would be limited to open water and salt marsh habitat. While eelgrass habitat does not currently exist near the I-5 bridge crossing, surveys for this community would be completed prior to bridge widening. The widening of the I-5 bridge would result in impacts to waters of the U.S. and State wetlands as a result of additional road bed fill and columns as well as shading. Saltmarsh habitat that potentially supports the State-listed as endangered Belding's savannah sparrow and coastal sage scrub that supports federally listed as threatened coastal California gnatcatcher would be impacted by widening of the San Dieguito Lagoon I-5 bridge. In addition, indirect effects already occurring would be incrementally increased. The large area south of the channel that is under the existing bridge has over 400 feet available for wildlife movement, although the existing bridge is supported by bridge support walls that can produce a "tunnel effect" between the supporting walls. Caltrans is reviewing the possibility of cutting holes into the support walls to allow light through.

The existing distance between the I-5 bridge and the San Dieguito River/Lagoon opening to the ocean, combined with the existing length of the I-5 bridge structure (and associated accommodation of flood flows, wildlife movement, etc.) support the conclusion that the current I-5 crossing is an appropriate length. Project improvements would not require any new or expanded shoreline protection, and would not adversely affect the implementation and success of the ongoing lagoon restoration project. No change is proposed from the I-5 bridge design (length, width, or footings) proposed in the Draft EIR/EIS.

Agua Hedionda Lagoon

Agua Hedionda Lagoon is crossed by three transportation facilities (Coast Highway, railroad, and I-5) that control water flow through the lagoon. The inlet to the lagoon flows under the Coast Highway and is stabilized by fixed jetty structures that maintain an open inlet to the lagoon. The proposed bridge would retain its existing length, but its width would increase by 111.5 feet over the existing structure. It is anticipated that the bridge would have several large support columns rather than the many small columns currently in place, resulting in a smaller direct footprint in the water and a more open visual profile beneath the bridge span. The main support columns would be four-foot cast in place drilled hole footings, with the only potential for pile driving being two-foot diameter piles at the abutments. Improved pathways or "benches" (flattened and elevated soil above the waterway) on both abutments for wildlife crossing under the bridge, as well as a bike/pedestrian path across the lagoon on the east side of I-5, are both parts of the project.

Impacted habitats would consist primarily of open water and mudflat, with some eelgrass beds also affected. There are no known federally or State-listed threatened or endangered species within the I-5 construction footprint at Agua Hedionda Lagoon, with associated direct impacts therefore not anticipated. Eelgrass surveys would be conducted prior to, during, and after I-5 construction. Indirect effects already occurring to the minimal native habitat near the lagoon

would be incrementally increased. There is also a potential for construction-related noise impacts to both bird and fish species from pile driving during bridge footing construction.

The lack of substantial difference in ecological benefits provided by the I-5 lagoon crossing alternatives, together with the substantial increases in costs associated with those alternatives, supports identification of the proposed project as the appropriate bridge. No change is proposed from the I-5 bridge design length or width proposed in the Draft EIR/EIS.

San Elijo Lagoon

Three basins in San Elijo Lagoon are divided by existing transportation facility crossings (Coast Highway, railroad, and I-5). The I-5 bridge over the lagoon is proposed to be lengthened by 263.1 feet over existing conditions. Construction of the new bridge would require a width of 288 to 353.6 feet to accommodate the construction area (including the I-5 / Manchester Avenue interchange. A bench to facilitate wildlife movement would be provided on the I-5 southern abutment, below a proposed 12-foot-wide fenced pedestrian path. A proposed bike/pedestrian path connection would be provided on a secondary bridge suspended from the western side of the I-5 structure.

Construction of a longer bridge would result in net gain in waters of the U.S. and State wetlands, and also would allow for a wider range of restoration options. I-5 improvements would result in impacts to habitat used by coastal California gnatcatcher and wandering skipper butterfly, as well as potential construction noise impacts to wildlife. Incremental increases to existing indirect effects would occur if a build alternative is approved.

Along with implementation of the other features of San Elijo Lagoon Restoration Project, the proposed I-5 bridge would result in increased tidal range and fluvial flow characteristics, with associated benefits for lagoon habitats, residence time, water quality, and flood control.

Batiquitos Lagoon

The basins of Batiquitos Lagoon are crossed by three existing transportation facilities (Coast Highway, railroad, and I-5). These crossings and the development around the lagoon are constraints to the lagoon's hydraulic flows and potential expansion. The new I-5 bridge configuration would be similar to the existing bridge (i.e., two bridge structures with a gap separating the north- and southbound lanes). The bridges would be lengthened by 63 feet over the existing length. New abutments would be built with benches for wildlife movement on the southern abutment, and for use as a combined pedestrian path and wildlife corridor on the northern abutment. A new bike/pedestrian path is proposed that would cross the lagoon on the western side of the I-5 bridge.

Biological resources impacted by widening of I-5 and replacement of the bridge would include waters of the U.S. and State wetlands, eelgrass habitat, and habitat occupied by Belding's savannah sparrow. California gnatcatcher using existing cut slopes of I-5 also would be impacted. Light-footed clapper rail habitat may be temporarily impacted. Incremental increases to existing indirect effects would occur if a build alternative is approved. There is also a potential for construction-related noise impacts to both bird and fish species from pile driving during bridge footing construction.

The proposed I-5 bridge would result in increased tidal range in the eastern basin, which would result in increased salt marsh and other intertidal habitats, with less subtidal habitat. The

increased area would enhance flushing and reduce residence time, thereby improving water quality within the lagoon. The proposed bridge provides enhanced function without over engineering, as additional lengthening would provide only minimal additional benefit relative to the associated cost.

Implementation of the new bridge structures over Batiquitos Lagoon would be phased to maintain operational capacity throughout construction. An option under consideration to reduce wetland impacts would include advancing the replacement of the Batiquitos bridge in the phasing plan, so that bridge replacement would occur during the HOV extension. If advanced in time, only four existing lanes (rather than five under the current phasing plan) would have to be open in each direction during construction. This would reduce each bridge footprint as the bridge width necessary to accommodate construction-period traffic would be reduced by two lanes (8 lanes rather than 10). Project funding would have to be obtained and approved in the first phase (2010 to 2020) instead of the second phase (2021 to 2030) in order to move forward with this option.

Buena Vista Lagoon

Buena Vista Lagoon is segmented into four basins by four hydraulic connections that include channels under the rail and I-5 bridges, culverts under Coast Highway, and a weir between the lagoon and the ocean. The three north-south transportation facilities between the basins constrain water flow within the lagoon. The I-5 bridge would be lengthened by 94.6 feet over the existing length. Project improvements also would deepen and increase the bottom width of the channel. Sixteen-foot benches for wildlife crossings would be built at both north and south I-5 abutments to accommodate use by small- and medium-sized mammals.

Implementation of the new bridge structures over Buena Vista Lagoon would be phased to maintain operational capacity throughout construction. Current project phasing and funding would result in the extension of one HOV lane in each direction from Manchester Avenue to SR-78 prior to 2020, followed by Buena Vista Lagoon bridge replacement between 2021 and 2030. An option under consideration to reduce wetland impacts would include advancing the replacement of the Buena Vista bridge in the phasing plan, so that bridge replacement would occur during the HOV extension. If advanced in time, only five existing lanes (rather than six under the current phasing plan) would have to be open in each direction during construction. This would reduce each bridge footprint as the bridge width necessary to accommodate construction-period traffic would be reduced by two lanes (10 lanes rather than 12). Project funding would have to be obtained and approved in the first phase instead of the second phase in order to move forward with this option.

Biological resources impacted by replacement and widening of the bridge would include waters of the U.S. and State wetlands, and habitat occupied by light-footed clapper rail. Sampling for potential presence of tidewater goby will be completed in summer 2012. Incremental increases to existing indirect effects would occur if a build alternative is approved.

Based on the above discussion, a bridge length of 197 feet has been identified as appropriate (i.e., the length at which tidal range and flood conveyance would be most favorable), and further increase in bridge length would bring only minimal benefit. Specifically, the I-5 bridge would increase flow through the lagoon and improve water quality. These optimized channel configurations would support a range of restoration alternatives. The I-5 and railroad bridge improvements anticipated as part of the current project and LOSSAN double-tracking would support the restoration alternatives. Localized downstream flooding in the Coast Highway Basin

could occur, however, if the Coast Highway crossing is not changed during I-5 crossing optimization.

S.7 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Impacts resulting from the I-5 lagoon crossings (e.g., with respect to U.S. Army Corps of Engineers [ACOE] waters of the U.S., including wetlands and State jurisdictional habitats and upland habitats), would be unavoidable because I-5 is an existing north-south transportation corridor that transects the east-west lagoon drainages. All of the projects build alternatives incorporate design features to minimize such impacts. Conservation measures also are included to avoid unnecessary impacts to sensitive resources during project construction activities.

Compensatory mitigation measures would be used to mitigate for unavoidable impacts consistent with State and federal regulatory requirements, including the ACOE's 2008 Compensatory Mitigation Rule (33 CFR part 332). I-*5 NCC Project* mitigation and enhancement features comprise a substantial part of the PWP/TREP, introduced in *S.3*, above. The PWP/TREP addresses all impacts and proposed mitigation for the I-5 North Coast Corridor, including the *I-5 NCC Project*, the LOSSAN projects, and a number of identified local agency projects.

Specifically, the Resource Enhancement Program (REP) provides for mitigation planning and implementation through the PWP/TREP process. It would utilize a combination of traditional and non-traditional measures to mitigate natural resource impacts from the proposed improvements, particularly with respect to enhancing marine and environmentally sensitive habitat area (ESHA) resources. The REP would effectively mitigate North Coast Corridor highway, rail and local project impacts in a manner that addresses regionally significant resource enhancement and preservation needs. REP measures include strategically acquiring restoration opportunities, preserving existing ESHAs, and enhancing lagoon system function and values through transportation facility infrastructure improvements and facilitating restoration plans, all within the North Coast Corridor coastal zone area. The REP also establishes an endowment to increase the capacity for long-term stewardship of North Coast Corridor resources for the foreseeable future. The REP provides the planning and implementation framework to ensure the most valuable, high quality mitigation opportunities in the North Coast Corridor are identified, secured, and prioritized for implementation in a manner that cost-effectively utilizes available mitigation funding to maximize benefits to the corridor's natural resources.

The REP also provides new and improved transitional habitat and buffer areas, restored riparian corridors, preservation and/or restoration of habitat areas via the purchase of land areas adjacent to corridor lagoons, and comprehensive lagoon restoration through transportation facility infrastructure improvements and funding of major restoration efforts, will address water quality improvements and habitat needs of special-status and wildlife species, and achieve the overall goal of enhancing biodiversity and habitat value throughout the corridor.

Section 3.1.3 in *Chapter 3* of this document describes this comprehensive approach to identifying mitigation parcels purchased, proposed mitigation sites, and options for use of allocated mitigation funding for various restoration or enhancement opportunities and/or endowments relative to the *I-5 NCC Project*. Although the REP covers all corridor impacts as part of the PWP/TREP, this Supplemental Draft EIR/EIS addresses mitigation relevant and specific to impacts identified for the *I-5 NCC Project*. Because specifics of this important project element are still being refined, current commitments and expectations are described in this

document, which will be further clarified in the Draft PWP/TREP and Final EIR/EIS. Benefits of the program are summarized below.

The constrained, primarily developed North Coast Corridor leaves few opportunities for large-scale land purchases for restoration opportunities to enhance the corridor's natural resources. Additionally, the subject lagoon habitats are biologically unique and cannot be replicated elsewhere; thus, opportunities to enhance these habitats require comprehensive solutions with improvements focused on ecosystem-wide benefits.

Compilation of all North Coast Corridor projects into a single mitigation and enhancement program ensures that the most accurate assessment of total potential impacts is being made and that the best overall options for mitigation of that total effect are being evaluated. Addressing impacts on this corridor-wide basis would provide greater regional benefit than mitigating on an individual project basis as these projects independently move forward over the next few decades. This is because: (1) mitigation for all included projects would be implemented in the near-term rather than as impacts occur (which would result in some mitigation being delayed for substantial periods of time); (2) areas proposed to be acquired for habitat preservation, establishment, restoration, and/or enhancement are more likely to be available in the near-term (i.e., such areas could be subject to development or other uses that would preclude mitigation if they are not secured in the near-term); and (3) implementing mitigation in the near-term would result in substantial additional time during which functional and connected habitat areas mature and are available for use by associated flora and fauna, including sensitive species. Specifically, then, benefits would include the following:

- The REP would result in immediate and permanent set aside of existing (or appropriate for restoration) habitats. Because a number of these habitats support sensitive floral and faunal species, associated benefits to activities such as breeding, foraging, and nesting would also be realized, thereby improving the overall conditions for these species on a regional basis.

- The corridor-wide approach to mitigation in the REP would provide greater regional benefits to coastal resources than a more traditional site-specific approach. Specifically, this conclusion is based on considerations including the fact that potential conflicts between in-place habitat preservation/restoration sites and impacts from subsequent development proposals would be minimized or avoided.

- A number of new pedestrian/bicycle trails and connections with existing trails/corridors addressed in the PWP/TREP, as well as project-implemented wildlife corridor improvements, would provide potential for recreational and wildlife movements between different areas such as lagoons, habitats, and recreational sites, with associated regional benefits for wildlife (e.g., enhanced gene flow between populations) and recreationalists (e.g., opportunities for unhindered access between coastal and/or inland sites).

- Implementation of the PWP/TREP on a corridor-wide basis would allow enhanced opportunities to implement water quality treatment/enhancement, as opposed to a traditional project-specific approach. Specifically, under the REP scenario, BMPs (particularly design pollution prevention and treatment measures) can be more effectively designed to address issues affecting entire watersheds (rather than individual drainages or water bodies), thereby providing a more regionally based approach to pollutant control/treatment and related ecosystem benefits.

- The corridor-wide approach would improve opportunities for regional air quality improvement, through efforts such as providing more extensive, and connected, facilities for HOV use, ride-sharing, links to public transportation, and alternative transportation (e.g., connected bicycle lanes, as previously described).

S.8 WATER QUALITY

Project implementation would result in the construction of new impervious (pavement) areas. As described in *Section 3.10, Water Quality and Storm Water Runoff,* of the Draft EIR/EIS, a potential increase in concentration of targeted design constituents may be generated as a result of project construction, maintenance, and operation. The potential discharge of these constituents could affect downstream receiving waters, including 303(d)-listed impaired water body segments. A number of existing treatment best management practices (BMPs) are present within the project limits, providing treatment for runoff from associated paved areas within the I-5 corridor. Approved Caltrans treatment BMPs are proposed and include, but are not limited to, biofiltration swales, biofiltration strips and detention basins. Proposed treatment BMP siting locations and associated contributing drainage areas are based on preliminary design, and would be further evaluated and modified during project development. Approved treatment BMPs proposed as part of the *I-5 NCC Project* would provide stormwater treatment for runoff from both existing and proposed impervious areas within the project corridor. The LPA would result in approximately 249 acres of new impervious area, with treatment proposed for approximately 256 acres (or 103 percent) of the equivalent net new impervious area.

S.9 COORDINATION WITH PUBLIC AND OTHER AGENCIES

Chapter 4, Comments and Coordination, discusses coordination efforts related to lagoon studies and resolution of project-related issues between November 2010 and the release of this document. The coordination process has included consultation and coordination with resource agencies, state legislators, local jurisdictions, and other stakeholders. Because of the focus on jurisdictional waters and associated sensitive species, this ongoing coordination is largely a continuation of Clean Water Act (CWA) Section 404 integration process agency coordination; focused on continued technical analysis and design for which specific federal and State resource agencies are responsible under federal and State law. Meetings have also occurred with North Coast Corridor stakeholder groups to provide project information, address project status, and obtain specific input on issues under their purview.

Guidelines under Section 404 of the CWA specify that a standard individual permit can be issued for a discharge of dredged or fill material to waters of the United States (U.S.) only if the discharge is determined to be the least environmentally damaging practicable alternative (LEDPA) [40 CFR §230.10 (a)]. For this analysis, the LEDPA generally is the practicable alternative that either avoids waters of the U.S. or impacts the smallest area of waters. The LEDPA analyses for the *I-5 NCC Project* will be completed prior to publication of the project Final EIR/EIS. ACOE regulations (33 CFR parts 320-332) also require that a discharge cannot be authorized if it would be contrary to the public interest. Information included in the Final EIR/EIS will be considered by the ACOE in making a public interest determination.

In addition to the ongoing agency coordination, five public hearings were held in 2010 to present details about the proposed project design, the alternatives being considered, and findings from the environmental studies, as identified in the Draft EIR/EIS prepared for the project. As previously noted, verbal and written comments submitted at the hearings, as well as all other

comments received during the public review period of the Draft EIR/EIS, will be addressed in full in the Final EIR/EIS.

S.10 PERMITS AND APPROVALS NEEDED

The following permits, reviews, determinations, and approvals were identified in the Draft EIR/EIS as required for project construction.

Table S.2
PERMITS AND APPROVALS NEEDED

Agency Permit	Approval	Status
U.S. Fish and Wildlife Service & National Oceanic and Atmospheric Administration/National Marine Fisheries Service	Endangered Species Act Section 7 Consultation for Impacts to Threatened and Endangered Species	Pending
U.S. Army Corps of Engineers	Concurrence on LEDPA CWA Section 404 and Rivers and Harbors Act Section 10 Standard Individual Permit for Discharging Dredged or Fill Material in Waters of the U.S.; and for structures and work in, over, and/or under navigable waters, respectively Marine Protection Research and Sanctuaries Act of 1972 Section 103 Permit for deposit of sediment into the ocean	Pending
California Department of Fish and Game	California Fish and Game Code (FGC) Section 1602 Agreement for Streambed Alteration FGC Section 2080.1 Consistency Determination	Pending
Regional Water Quality Control Board – Region 9	CWA Section 401 Certification	Pending
California Coastal Commission	CZMA Federal Consistency Certification Coastal Development Permit(s) for areas of retained jurisdiction Local Coastal Program Amendments Public Works Plan Approval	Pending
California Transportation Commission	Funds Appropriation and New Freeway Access	Pending
National Oceanic and Atmospheric Administration/National Marine Fisheries Service	Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Coordination	Pending
California Public Utilities Commission	Utility Construction Permit Request	Pending
Metropolitan Transit System (MTS)	Construction and maintenance agreements for Sorrento Valley Overhead	Pending
North County Transit District (NCTD)	Construction and maintenance agreements for Oceanside Overhead	Pending
City of San Diego	Freeway Agreement for Voigt Drive DAR	Pending
City of Encinitas	Freeway Agreement for Manchester Avenue DAR	Pending

S.11 NEXT STEPS IN THE CEQA/NEPA PROCESS

Key upcoming steps in the CEQA/NEPA process for the *I-5 NCC Project* are as follows:

- Caltrans and FHWA will prepare a Final EIR/EIS to evaluate and provide written responses to comments received on the Supplemental Draft EIR/EIS and the Draft EIR/EIS. These responses will describe the disposition of substantive comments on environmental issues documented in the Supplemental Draft EIR/EIS.

- Upon completion of the Final EIR/EIS, Caltrans and FHWA will provide an opportunity for review of the document by the public and commenting agencies prior to approval of the project. The Final EIR/EIS will be filed with the State Office of Planning and Research (CEQA requirement) and the U.S. Environmental Protection Agency (USEPA) Office of Federal Activities (NEPA requirement). USEPA will publish a Notice of Availability in the *Federal Register*. Consistent with NEPA requirements, a 30-day public review period of the Final EIR/EIS, as measured from the date of the notice, will be conducted at that time.

- Caltrans will prepare written findings for each significant effect identified by the Final EIR/EIS (CEQA requirement). Each of these findings will be accompanied by a brief explanation of Caltrans's rationale for these determinations. Caltrans will then decide whether to (1) approve the project or (2) not approve the project.

- Caltrans will prepare a Statement of Overriding Considerations (CEQA requirement) if unmitigated significant impacts have been identified. This statement would document the balancing of project benefits against unavoidable environmental risks in the determination of project approval.

- Upon Caltrans' decision regarding certification of the EIR, a Notice of Determination (CEQA requirement) will be filed with the State Office of Planning and Research.

- Parallel to the State approval process, and after completion of the 30-day Final EIR/EIS review period noted above, the FHWA will consider all available information on the environmental effects of the project identified in the Final EIR/EIS (including comments received) and render its decision. At that time, FHWA will, in accordance with 40 CFR 1502.2 and 23 CFR 771.127, prepare a Record of Decision (NEPA requirement).

The filing of the Notice of Determination and signing of the Record of Decision completes the CEQA and NEPA processes, respectively.

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Chapter 1

Introduction to this Supplemental Environmental Document

CHAPTER 1 – INTRODUCTION TO THIS SUPPLEMENTAL ENVIRONMENTAL DOCUMENT

This document is a Supplemental Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed I-5 North Coast Corridor Project (*I-5 NCC Project*).[1] The information in this document is intended to supplement the Draft EIR/EIS prepared for this project and released for public review on July 9, 2010.[2] It documents studies completed and other occurrences since circulation of the Draft EIR/EIS; providing additional information supporting Draft EIR/EIS conclusions relative to impacts focused on lagoons as well as information about the currently proposed Locally Preferred Alternative (LPA). The LPA is the 8+4 Buffer refined from the Draft EIR/EIS; and is preferred by Caltrans because it has the smallest footprint and fewest or lowest impacts. Specifics regarding the decision to circulate this supplemental document are addressed in Section 1.1, below.

The *I-5 NCC Project* proposes improvements to approximately 27 miles of this critical north-south interstate, between La Jolla Village Drive in the City of San Diego and Harbor Drive in the City of Oceanside/Camp Pendleton (PM R28.4 to R55.4) (see *Figure 1-1.1*); and proposes to create lanes for high occupancy vehicles (HOVs) and potential bus use, with HOV lanes constructed for managed use, referred to here as HOV/Managed Lanes (i.e., lanes where operational strategies are proactively implemented and managed in response to changing conditions through control of vehicle type, number of passengers, and/or pricing). The notice of public review for the *I-5 NCC Project* Draft EIR/EIS was published in the Federal Register on July 9, 2010.

The circulated Draft EIR/EIS addressed improvements to the existing I-5 configuration (generally four general purpose lanes in each direction). That document analyzed four build alternatives consisting of 8 to 10 through lanes based on either retention of the 8 through lanes or adding one additional general purpose lane in each direction in portions of I-5 where there are not already 10 lanes. Addition of two HOV/Managed Lanes separated from the general purpose lanes by either buffers or barriers was assessed for both the 8 and 10 lane alternatives. The reader is referred to *Chapter 2, Purpose and Need and Project Description*, for more information on these alternatives. All the build alternatives would maintain or improve future traffic operations and travel times when compared to existing traffic operations. The build alternatives also are all compatible with alternative transportation options currently being evaluated within the North Coast Corridor (e.g., pedestrian, bicycle, carpool, transit, and rail).

1.1 DECISION TO PREPARE A SUPPLEMENTAL ENVIRONMENTAL DOCUMENT

The Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) made the decision to prepare a supplemental environmental document in accordance with regulations and guidance from the National Environmental Policy Act (NEPA) in 40 Code of Federal Regulations (CFR) 1502.9 and the California Environmental Quality Act (CEQA) Guidelines Section 15163.

A primary focus concerns the lagoons and waterways crossed by the I-5 facility. Although substantial information regarding lagoon resources, their existing condition, potential project

[1] The full text of the Draft EIR/EIS is available at www.keepsandiegomoving.com, under the I-5 Express Lanes Project. That document contains full discussion of evaluated alternatives, anticipated impacts, and community outreach as of July 2010. The website also contains current information regarding related documents, ongoing project efforts and relevant legislation.

[2] The FHWA has not identified an LPA under NEPA.

effects, and avoidance, minimization and mitigation measures was presented in the Draft EIR/EIS, that document also noted that secondary phase detailed studies of lagoon hydrology were underway to support bridge optimization lengths. Subsequent to circulation of the Draft EIR/EIS, the cited studies were completed.

In addition, a number of other events have occurred since July 2010 that are applicable to the project, including passage of California Senate Bill (CA SB) 468, Streets and Highways Code Sections 103 and 149.10 (Kehoe 2011), adoption of the 2050 Regional Transportation Plan (RTP), and continued coordination with local cities and the resource agencies regarding project specifics. This Supplemental Draft EIR/EIS therefore includes: documentation of measures adopted to address coastal wetlands; further details about the proposed community and regional enhancement features; information about project phasing presented and adopted in the 2050 RTP; and information about the LPA, which is consistent with CA SB 468 (see further discussion on CA SB 468 within *Section S.3, Purpose and Need*, of this chapter.

In July 2011, Caltrans identified the 8+4 Buffer alternative as the LPA. The LPA would consist of two HOV/Managed Lanes in each direction, separated from the existing four general purpose lanes in each direction by a buffer. This proposed build alternative best meets the project purpose and need, while minimizing potential environmental impacts that would result from construction of the project. The LPA has been, and will continue to be, refined in order to further reduce impacts to the human and natural environment. It also is important to note that refinements made to the LPA reflect comments received from the public, as well as ongoing engineering review. The refinements are described in detail in *Section 2.2* of this Supplemental Draft EIR/EIS.

The primary purpose of this supplemental is to confirm impacts and benefits to the lagoons based on finalized studies. In addition to refining the analysis of lagoon impacts in the Draft EIR/EIS, this supplemental includes updates for LPA design and community enhancements. Therefore, information presented in this Supplemental Draft EIR/EIS does not result in identification of new CEQA-significant impacts, or a substantial increase in the severity of effects identified in the Draft EIR/EIS, but supports the applicable sections in the Draft EIR/EIS. The Final EIR/EIS will include the combined information from the Draft EIR/EIS and this Supplemental Draft EIR/EIS, as well as responses to all substantive comments received during public comment periods for both the Draft EIR/EIS and this Supplemental Draft EIR/EIS. It is anticipated that the Final EIR/EIS will be released in 2013.

1.2 BACKGROUND

The background information in this section is summarized from the Draft EIR/EIS to assist the reader in understanding the information in this document.

1.2.1 Environmental Planning Process to Date

Transportation within the North Coast Corridor takes a number of forms (cars, trains, trolleys, buses, bicycles, and pedestrians). There have been many studies conducted in the corridor over the past 20 years, and these studies have been refined to come up with the best mix of transportation options for the corridor. Some of the key studies are summarized below.

1.2.1.1 *Summary of General and Focused Planning*

In the early 1990s, Caltrans conducted an operational study of the corridor, looking at I-5 from the I-805 merge in the south to Camp Pendleton in the north. The geographic and population constraints on I-5, as well as nearby rail facilities, led transportation agencies to the conclusion that long-range planning for this transportation corridor would require multiple transportation options rather than focusing on a single form of transportation. Between 1995 and 1997, Caltrans and the San Diego Association of Governments (SANDAG) completed a number of studies summarized in the 2000 SANDAG *North Coast Transportation Study* (NCTS). That study screened options for addressing transportation shortfalls and improving all forms of transportation from State Route 52 (SR-52) in the northern portion of the City of San Diego to the Orange County line; including freeways, railways, freight movement, and other forms (such as monorail, ferry service, reversible car pool lanes, etc.). While rail agencies moved forward with more focused rail studies, the highway recommendations from the NCTS were formalized in the 2000 Project Study Report (PSR) for the *I-5 NCC Project*.

The PSR focused on nine highway alternatives. Studies of those nine alternatives were subsequently initiated by Caltrans. In 2002, SANDAG completed the Regional High Occupancy Vehicle Managed Lanes Study, which concluded that a four-lane HOV/Managed Lanes facility would be required to meet projected 2030 HOV demand and to join with similar lanes on I-805 and existing HOV lane segments on I-5 in the corridor. These 2002 SANDAG recommendations for HOV lanes were folded into the PSR, reflecting the new 2030 design year, and adopted as the long-range improvement concept for this portion of I-5 in the 2003 RTP (MOBILITY2030). Following adoption of the 2003 RTP, fine tuning of scenario development continued, focusing on the related design features and operational issues associated with Direct Access Ramps (DARs) that are grade separated and intermediate access points (IAPs) that are at grade. The DARs are ramps that allow traffic to directly enter and exit the HOV/Managed Lanes located in the center of the freeway. DARs typically connect to local streets next to a freeway, and cross over the freeway lanes to connect directly to the HOV/Managed Lanes. A benefit of DARs is that they allow traffic to flow into the HOV/Managed Lanes, without having to cross multiple lanes of traffic, thus improving traffic flow and commute times for vehicles that qualify as multiple occupancy vehicles. The IAPs allow traffic to move in and out of the HOV/Managed Lanes from the general purpose lanes of the freeway.

The *I-5 San Diego North Coast Corridor System Management Plan* (CSMP) is required by a bond measure passed by voters in 2006. CSMPs are “living” documents that are updated through time, when new information is available and when roadway performance monitoring is conducted. The I-5 North Coast CSMP assessed several different options to address current and future demand. This resulted in identification of a solution that included double tracking the rail corridor, adding HOV/Managed Lanes (now identified as express lanes) on I-5, and improving regional arterials, bicycle/pedestrian routes and bus, rail, and vanpool/carpool services. Near the same time, specific transportation areas were further studied, including: the *I-5 NCC Project*; the Sustainable Communities Strategy and Urban Area Transit Strategy (both new elements in the SANDAG 2050 RTP); the San Diego Regional Goods Movement Action Plan; the TransNet Bicycle, Pedestrian and Neighborhood Safety Program; and the San Diego Regional Bicycle Plan.

In 2007, programmatic-level plans for rail improvements within the corridor were addressed in the Los Angeles – San Diego – San Luis Obispo (LOSSAN) Rail Corridor Final Program EIR/EIS. Potential improvements included a mix of adding tracks to doubletrack large segments of the rail line, and other track enhancements; such as rail bridge replacement, pedestrian

crossings, vehicle crossing improvements, parking expansion, new platform locations, and other station enhancements. These were prioritized in the 2007 San Diego – LOSSAN Corridor Project Prioritization Analysis. Currently, a number of rail-focused efforts are underway, including double-tracking, bridge replacement, and stabilization efforts.

1.2.1.2 *Current Planning Status*

The studies noted above evaluated multiple transportation options within this corridor. The third decade of I-5 studies began with release of the Draft EIR/EIS for the *I-5 NCC Project*, which represents one element in this much larger and ongoing multi-agency effort. The *I-5 NCC Project* is responsive to SANDAG's multi-modal vision to include highway improvements as a critical contributing element in reduction of existing and projected congestion in this corridor. The build alternatives addressed in the Draft EIR/EIS were designed to be consistent with the 2030 RTP, and subsequently the 2050 RTP, and had been developed in coordination with NEPA 404 Integration Agency and other public input (as discussed in Section 1.2.2, below). Identification of the LPA is part of the ongoing effort to minimize environmental impacts while still meeting purpose and need required under NEPA and the 404 Integration Process, while also being consistent with the newly approved 2050 RTP.

A preliminary Highway Public Works Plan and Transportation and Resource Enhancement Program (PWP/TREP) was prepared and circulated June through August 2010. Development of the PWP/TREP has continued, with a Draft PWP/TREP being released for public review in fall 2012. The PWP/TREP is a coordinated permitting document to obtain federal consistency certification and approval of the *I-5 NCC Project* elements within the jurisdiction of the California Coastal Commission (CCC). This document evaluates the north coast corridor as a whole, and incorporates all of the individual projects being pursued by the transportation agencies into an integrated regional vision. The PWP/TREP describes both I-5 and LOSSAN rail improvements; and provides the framework for coordination of rail, highway, and community and mitigation plans to ensure that rail and highway improvements are appropriately phased, and that mitigation occurs in coordination with the construction of transportation improvements. The PWP/TREP goes beyond mitigation, as implementation and success would result in enhancement of the impacted habitats within the North Coast Corridor, and provide benefits that would exceed standard mitigation required on a project-by-project and mitigation ratio basis (see additional discussion in *S.7,* above, as well as *Section 3.1.3,* below). This approach is consistent with the Environmental Mitigation Program (EMP), which was created as part of the TransNet Extension Ordinance. The EMP is intended to help fill the mitigation needs resulting from the RTP's major transportation improvement projects and programs. By conducting mitigation in a comprehensive manner, rather than a project-by-project basis, the EMP is intended to maximize opportunities for targeting key areas for advance habitat conservation, management, and monitoring. By providing the basis for review of a public works project, as a whole, the PWP/TREP eliminates the need for multiple coastal development permits associated with crossing each city jurisdiction.

Additional information about the Draft EIR/EIS alternatives, the LPA, and the PWP/TREP can be found at www.keepsandiegomoving.com, under the I-5 Express Lanes Project, with detailed information regarding LPA design located in *Chapter 2* of this document.

1.2.2 Circulation of the Draft EIR/EIS and Coordination with Federal, State, and Local Agencies, and Public Outreach

1.2.2.1 *Circulation of the I-5 NCC Project Draft EIR/EIS*

Public review of the Draft EIR/EIS began on July 9, 2010. Five open-house style public workshop hearings were held to present details about the proposed project design, the alternatives being considered, and findings from the environmental studies, as described in the Draft EIR/EIS, during the public review period for circulation of the Draft EIR/EIS for the *I-5 NCC Project*. The meetings were held in the following cities on the dates provided:

- Encinitas - July 27, 2010
- San Diego - August 8, 2010
- Carlsbad - August 17, 2010
- Solana Beach - August 24, 2010
- Oceanside - September 9, 2010

Over 5,000 comments were received regarding the *I-5 NCC Project*, the Draft EIR/EIS, and associated technical documents in comment cards, letters, and emails. Comments were submitted in writing (via post, email, or at the public hearings), as well as transcribed from verbal comments given to a court reporter who attend all of the hearings. The substantive comments with Caltrans responses will be provided in the Final EIR/EIS.

1.2.2.2 *Coordination with Federal, State, and Local Agencies*

Since 2004, FHWA and Caltrans staff has worked closely with representatives of the U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (ACOE), and National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS). Early contact with these agencies occurred as part of the NEPA 404 Integration Process.[3] Coordination with these agencies included obtaining concurrence on the project purpose and need statement, criteria for alternative selection, range of alternatives to be considered, the selected alternative, and mitigation plans.

In addition, FHWA and Caltrans have coordinated with the California Department of Fish and Game (CDFG), Regional Water Quality Control Board – Region 9 (RWQCB), CCC, the State

[3] In May 1992, the U.S. Department of Transportation, the U.S. Department of Army-Civil Works, and the U.S. EPA adopted a policy to improve interagency coordination and to integrate NEPA and the Clean Water Act (CWA) Section 404 procedures. (Section 404 addresses regulation of discharge of dredged and fill material into waters of the U.S., including wetlands.) A Memorandum of Understanding (MOU) was developed for Arizona, California, and Nevada. The Western States MOU applied to all projects needing FHWA/Federal Transit Administration (FTA) action under NEPA and an ACOE individual permit under CWA Section 404. The goal of the MOU was to have regulatory agencies participate in the project early in its planning and to have decisions made once for each stage of the process in order to expedite matters. Agencies agree to attempt to resolve issues causing non-concurrence and to try to do so informally before entering formal dispute resolution. As of 2006, Nevada and Arizona are no longer signatories and FTA is no longer a participant.

Under this process, the USFWS, NMFS, FTA, ACOE and EPA are asked to concur on project purpose and need, criteria for alternative selection and range of alternatives to be considered. The ACOE also verifies the delineation of jurisdictional wetlands. The MOU process also incorporates analysis of the project pursuant to Section 404(b)(1) of the CWA. Prior to release of a Final EIS, the ACOE, EPA, and USFWS are asked to provide preliminary agreement on conceptual mitigation for unavoidable impacts to special aquatic sites. The ACOE and EPA are also asked to provide preliminary agreement on the Least Environmentally Damaging Practicable Alternative (LEDPA) pursuant to the CWA.

Historic Preservation Officer (SHPO), Native American Tribes, the Native American Heritage Commission (NAHC), U.S. Marine Corps Camp Pendleton, and the Cities of San Diego, Del Mar, Solana Beach, Encinitas, Carlsbad, and Oceanside, as well as SANDAG for their review of the *I-5 NCC Project* Draft EIR/EIS. Comments on the Draft EIR/EIS were received from each of the federal, State, and city organizations, except Camp Pendleton. Coordination with these agencies is ongoing (see *Chapter 4, Comments and Coordination*), and will continue through approval and permitting actions associated with the *I-5 NCC Project*.

1.2.2.3 *Additional Project Outreach*

In early 2004, preliminary scoping meetings were held in the Cities of Carlsbad, Encinitas, Oceanside, San Diego, and Solana Beach before circulating the Notice of Preparation (NOP) of an EIR and Notice of Intent (NOI) regarding the EIS. Two separate newsletters were sent to addresses within one mile (east and west) of I-5 between the southern and northern project limits. Also since 2004, and in an effort to update interested parties and the public regarding overall project status, Caltrans staff (and Caltrans staff on behalf of FHWA) have attended meetings, conducted surveys, and presented hand outs and mailers. Presentations have been made to local communities and planning groups, homeowners associations, chambers of commerce, city councils, and local politician-sponsored meetings. Project information has also been updated and made available on the dedicated project web site at www.keepsandiegomoving.com. This website includes the project technical and summary documents, information regarding project public meetings, copies of e-newsletters on the project, and a 2011-initiated series of memoranda regarding “Frequently Asked Questions.”

1.3 HOW TO USE THIS DOCUMENT

This section provides summary information regarding the purpose of this Supplemental Draft EIR/EIS, an introduction to what the Supplemental Draft EIR/EIS contains, instructions on how to provide comments to be included in the public record, and information regarding future steps in the environmental process.

1.3.1 The Purpose of this Supplemental Draft EIR/EIS

The primary purpose of this document is to provide refined additional information and confirm analysis from the Draft EIR/EIS. A supplemental document is provided for this information in order to provide a clear format to focus members of the public and decision makers on the effects of the project alternatives on the lagoons. The document focuses on information made available since circulation of the Draft EIR/EIS and generally does not reiterate information provided in the Draft EIR/EIS; thereby allowing the reader to focus on the additional information.

1.3.2 What This Supplemental Draft EIR/EIS Contains

1.3.2.1 *Topics for Which Additional Information and Clarification is Provided*

- Specifics of bridge design, comparing the existing and proposed details
- Common design features
- Lagoon health, fluvial and tidal influence
- Water quality
- Coastal wetland and upland restoration
- Additional specifics of biological mitigation approach and implementation

- Community enhancement projects at lagoon locations with impact assessments
- Phased construction approach
- Air quality conformity
- Sea level rise strategies

Each of these topics is briefly reviewed here, together with information regarding location of data on these topics in this Supplemental Draft EIR/EIS.

Specifics of Bridge Design. Additional information is provided on bridge design, specifically related to length and width, and footing and span variations. Additional information is also provided regarding potential adverse effects related to reconstruction of existing bridge facilities and possible effects on lagoon health during construction.

Refined or clarified project elements for the LPA are presented in *Chapter 2. Chapter 3, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures*, addresses the associated changes to the impact analyses (i.e., with respect to hydrology/drainage and floodplains, water quality and storm water runoff, natural communities, wetlands and other waters, special animals, and threatened and endangered species) as these topics relate to lagoon habitats and/or species health and potential contamination during bridge reconstruction.

Common Design Features. *I-5 NCC Project* common design features are reiterated from the Draft EIR/EIS. Refinements and modifications to those features in the vicinity of the lagoons are described in *Chapter 2*, and impacts within the lagoon system can be found in *Chapter 3*.

Lagoon Health, Fluvial and Tidal Influence. Additional information is provided regarding lagoon health, and overall fluvial/tidal influence, as this information had not been completed prior to circulation of the Draft EIR/EIS. At this time, the results of additional modeling and technical study have been published and reviewed by the permitting resource agencies, and the results are incorporated into the *Chapter 3* analyses of this document.

Water Quality. Information on the percentage of water treated along I-5 for the length of the project is provided in *Chapter 3*.

Coastal Wetland and Upland Restoration. Details on the location and implementation of lagoon-focused impact minimization and mitigation are provided in *Chapter 3*.

Biological Mitigation. Additional details on the content of non-lagoon focused biological mitigation and how it would be implemented also are provided in *Chapter 3*.

Regional and Community Enhancement Projects. The regional and community enhancement projects are separate projects proposed by the communities abutting the project which: (1) are within the temporary and/or permanent impact area for the *I-5 NCC Project*, (2) would bring benefit to their communities, (3) were presented by the local agencies as projects that would result in minimal impacts relative to construction, and (4) would be constructed by Caltrans during *I-5 NCC Project* implementation. A full list of these projects is presented in *Chapter 2*, with details on bike/pedestrian path enhancements proposed at lagoon crossings in *Chapter 3*.

Project Phased Construction. The phasing and sequencing of construction, including roadway upgrades, and community enhancement installation, are presented in *Chapter 2*.

Air Quality Conformity. An updated and augmented discussion of the project's conformity to air quality regulations, including information regarding the construction of community enhancement projects and the effects of latent transportation demand on projected air quality benefits, is presented in *Chapter 2*.

Sea Level Rise Strategies. Information regarding State of California Executive Order S-13-08 and State requirements regarding review of infrastructure relative to potential effects of global warming and related sea level rise, as well as adaptation management strategies for addressing sea level rise are addressed in *Chapter 3*.

Other topics addressed in *Chapters 2 and 3* of this Supplemental Draft EIR/EIS include updates related to:

- The Locally Preferred Alternative
- Reduction of impacts at the I-5 / Manchester Avenue DAR

1.3.3 Public Review and Comment for the Supplemental Draft EIR/EIS

The public is provided with a 45-day review period of the Supplemental Draft EIR/EIS, beginning the day the CEQA Notice of Availability (NOA) is filed with the County Clerk and the NEPA NOA is published in the *Federal Register.* A public notice has been published in local newspapers of general circulation. The Final EIR/EIS for the *I-5 NCC Project* will include responses to substantive comments received on the Supplemental Draft EIR/EIS that pertain to the information analyzed in this document. An additional public hearing for this Supplemental Draft EIR/EIS is planned for Wednesday, September 19, 2012 at the City of Encinitas Community and Senior Center, 1140 Oakcrest Park Drive, Encinitas, CA 92024.

The public is requested to send comments via postal mail to:

Shay Lynn Harrison, Environmental Analysis Branch Chief
CA Department of Transportation – District 11
Division of Environmental Analysis, MS 242
4050 Taylor Street
San Diego, CA 92110

The public is requested to submit comments via email to:

I-5_NCC Project SDEIR_EIS@dot.ca.gov

Please submit all comments by the deadline: **Monday, October 15, 2012**

1.3.4 Next Steps Remaining for the Environmental Process

A number of additional documents, permits and agency actions will be required to complete environmental review of the *I-5 NCC Project*. Key items are:

- As part of the Clean Water Act (CWA) Section 404 permit, a Section 404(b)(1) alternatives analysis (40 CFR part 230) to determine the Least Environmentally Damaging Practicable Alternative (LEDPA) will be completed and presented in the Final EIR/EIS along with the Preferred Alternative.

- Following public circulation of this Supplemental Draft EIR/EIS, the public meeting on the document, and receipt of comments on it; responses to substantive comments will be prepared and merged with comments and responses on the Draft EIR/EIS. These comments and responses, the text of the Draft EIR/EIS, and the text of this Supplemental Draft EIR/EIS will be incorporated into the Final EIR/EIS for the *I-5 NCC Project*.

- Concurrently with preparation of the Final EIR/EIS, Caltrans, in coordination with SANDAG, will complete an updated draft PWP/TREP and associated local coastal program amendments for the project. The PWP/TREP will be publicly circulated and will have additional and separate public workshops to receive comments in accordance with CA SB 468 (Kehoe).

- Caltrans will prepare written findings for each CEQA-significant effect identified in the CEQA EIR component of the Final EIR/EIS. Each of these findings will be accompanied by a brief rationale for these determinations. Caltrans also will prepare a Statement of Overriding Considerations (CEQA requirement) if CEQA-significant impacts have been identified for which mitigation would not lower impacts to below significant levels. This statement would document the balancing of project benefits against unavoidable environmental risks, and would be considered during the determination of project approval. Caltrans will then decide whether to certify the EIR portion of the document (CEQA requirement).

- The PWP/TREP, coastal development permit(s) in areas of retained jurisdiction, and associated local coastal program amendments, will be submitted to the CCC for approval and a determination of Federal Consistency with the planning and management policies contained in Chapter 3 of the California Coastal Act and affected local coastal programs in accordance with the Coastal Zone Management Act (CZMA).

- The Final EIR/EIS will be submitted to FHWA for review and approval of the NEPA EIS. The Final EIR/EIS will be filed with the EPA's Office of Federal Activities (NEPA requirement). The EPA will publish a notice of availability in the *Federal Register*. Consistent with NEPA, a 30-day review of the Final EIR/EIS will occur at that time.

- Caltrans will consider the project for approval, and upon approval, will file a Notice of Determination (NOD; a CEQA requirement) with the State Office of Planning and Research.

- After the completion of the 30-day Final EIR/EIS review period, the FHWA will consider all available information on the environmental effects of the project identified in the Final EIS (including comments received and responses to them) and render its decision. At that time, the FHWA would, in accordance with 40 CFR 1502.2 and 23 CFR 771.127, prepare a Record of Decision (ROD; a NEPA requirement).

The filing of the NOD and signing of the ROD would complete the CEQA and NEPA processes, respectively. Following completion of CEQA and NEPA, other permits, agreements, and certifications related to impacts to jurisdictional waters (including potentially to rivers/harbors), utility construction, etc. will be obtained.

1.4 PERMITS AND APPROVALS NEEDED

The following permits, reviews, determinations, and approvals were identified in the Draft EIR/EIS as required for project construction. They are repeated here for ease of reader use.

Due to the removal of the DARs in Carlsbad and Oceanside, agreements with the Cities of Carlsbad and Oceanside for the Cannon Road and Oceanside Boulevard DARs, respectively, were removed from this matrix.

Agency Permit	Approval	Status
U.S. Fish and Wildlife Service & National Oceanic and Atmospheric Administration/National Marine Fisheries Service	Endangered Species Act Section 7 Consultation for Impacts to Threatened and Endangered Species	Pending
U.S. Army Corps of Engineers	Concurrence on LEDPA CWA Section 404 and Rivers and Harbors Act Section 10 Standard Individual Permit for Discharging Dredged or Fill Material in Waters of the U.S.; and for structures and work in, over, and/or under navigable waters, respectively Marine Protection Research and Sanctuaries Act of 1972 Section 103 Permit for deposit of sediment into the ocean	Pending
California Department of Fish and Game	California Fish and Game Code (FGC) Section 1602 Agreement for Streambed Alteration FGC Section 2080.1 Consistency Determination	Pending
Regional Water Quality Control Board – Region 9	CWA Section 401 Certification	Pending
California Coastal Commission	CZMA Federal Consistency Certification Coastal Development Permit(s) for areas of retained jurisdiction Local Coastal Program Amendments Public Works Plan Approval	Pending
California Transportation Commission	Funds Appropriation and New Freeway Access	Pending
National Oceanic and Atmospheric Administration/National Marine Fisheries Service	Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Coordination	Pending
California Public Utilities Commission	Utility Construction Permit Request	Pending
Metropolitan Transit System (MTS)	Construction and Maintenance Agreements for Sorrento Valley Overhead	Pending
North County Transit District (NCTD)	Construction and Maintenance Agreements for Oceanside Overhead	Pending
City of San Diego	Freeway Agreement for Voigt Drive DAR	Pending
City of Encinitas	Freeway Agreement for Manchester Avenue DAR	Pending

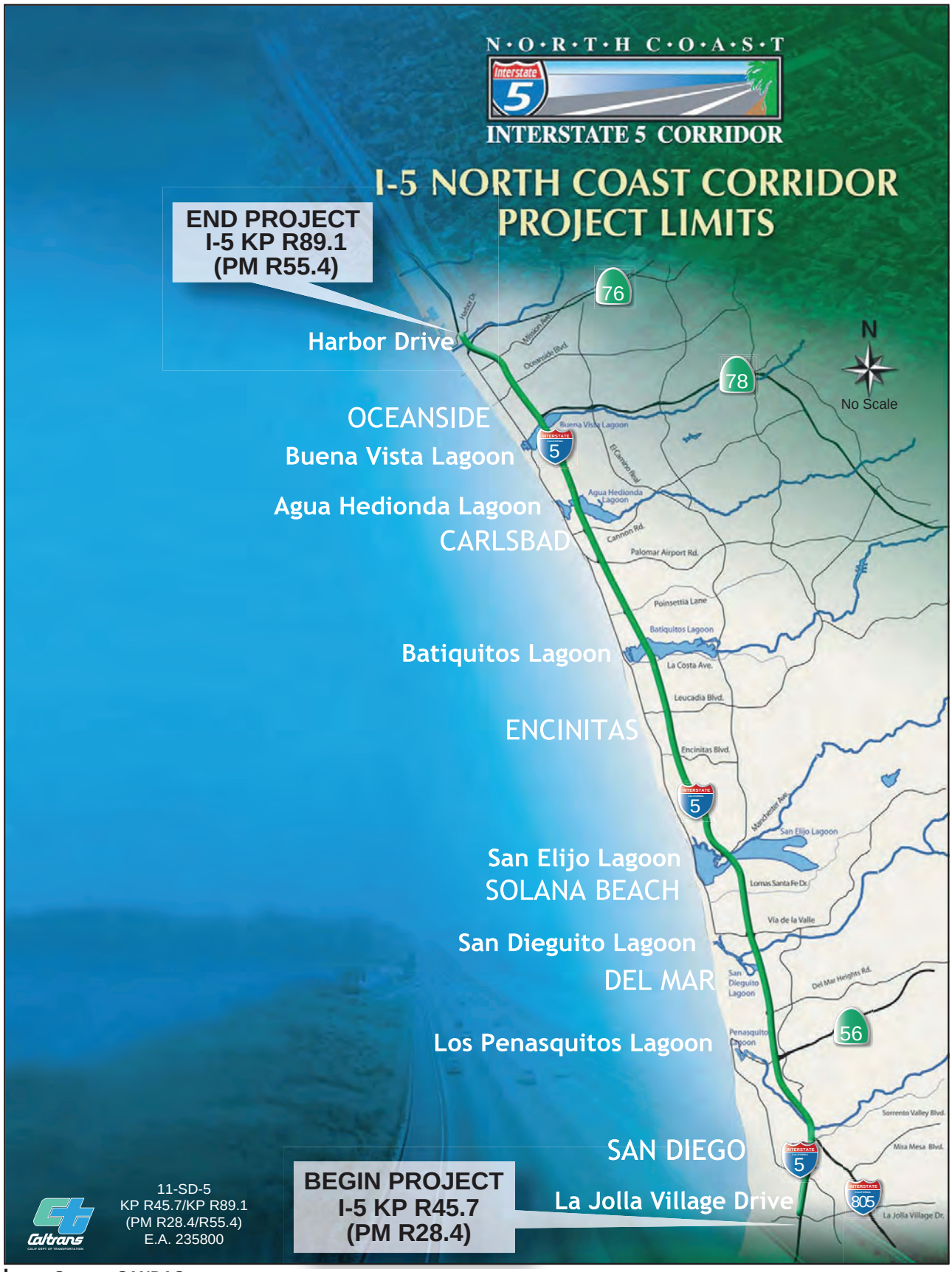

Image Source: SANDAG

Figure 1-1.1: Project Location Map

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INTERSTATE 5 CORRIDOR

Chapter 2

Purpose and Need and Project Description

CHAPTER 2 – PURPOSE AND NEED AND PROJECT DESCRIPTION

This chapter identifies changes in project circumstances and project design based on updated regional planning documents, new legislation, and results of lagoon optimization studies. These new data provide the basis for environmental analysis in *Chapter 3* of this Supplemental Draft EIR/EIS. Corridor constraints also are identified in this current chapter, which additionally summarizes alternatives analyzed in the 2010 Draft EIR/EIS, and provides the basis for identification of the Locally Preferred Alternative I-5 Express Lanes (LPA) as the best balance between I-5 improvement and minimization of environmental impact. Caltrans determined that the 8+4 Buffer or Express Lanes Project is the LPA under the California Environmental Quality Act (CEQA); the FHWA has not identified an LPA under the National Environmental Policy Act (NEPA).

2.1 PROJECT PURPOSE AND NEED

2.1.1 Constrained Project Setting

Urbanized land uses and natural environment are located in close proximity on the portion of I-5 covered by the proposed project. In this area, I-5 parallels the Pacific coastline to the west and the coastal ranges to the east; crossing rolling terrain, urbanized land uses and canyon topography, as well as five lagoons and several rivers and creeks. These water features are major natural and visual resources, and provide critical habitat and/or designated wildlife corridors for numerous plant and animal species protected by state and/or federal laws. These existing constraints have affected both development patterns and the overall transportation system within this coastal area.

The north-south highway option to I-5 is I-15, located an average of 10 miles to the east. Highway access to I-15 is limited to three east-west routes in the north part of the County; SR-56, -78 and -76. On I-5, SR-56 and SR-78 are separated by a distance of 18 miles, with Del Dios Highway being the only viable east-west non-highway (arterial) alternative.

The primary north-south arterial options to I-5 are El Camino Real and Pacific Coast Highway 101 (Coast Highway), also designated as County Route S21. Route S21 is a 24-mile two- to four-lane road extending along the coast and serving the established coastal communities within Del Mar, Solana Beach, Carlsbad, and Oceanside. It crosses many of the same water resources in the project area and is sited adjacent to existing rail right-of-way. El Camino Real is a major 16-mile-long arterial ranging in location from1 to 3 miles east of I-5. El Camino Real trends through the developing inland areas of the communities of Encinitas, Carlsbad, and Oceanside. Incomplete across the San Elijo Lagoon into Solana Beach, the southern segment of El Camino Real serves the communities of Lomas Santa Fe, Rancho Santa Fe, and Carmel Valley in the City of San Diego.

2.1.2 Project Purpose

The I-5 North Coast Corridor is subject to periods of congestion that are projected to worsen over the next 40 years. As stated in the Draft EIR/EIS, the *I-5 NCC Project's* main purpose is to maintain or improve the existing and future traffic operations along I-5 in the North Coast Corridor in order to improve the safe and efficient regional movement of people and goods for the project design year of 2050.

Given existing levels of congestion combined with projected numbers of future area residents and increase in potential I-5 users, almost certain future gridlock is anticipated. The *I-5 NCC Project* is an integral part of the multi-modal efforts to reduce future conditions associated with up to 13 hours per day of congestion within the North Coast Corridor; which would delay the movement of goods, services, and people.[1] It is not expected that all congestion would be eliminated along this segment of I-5. Similarly, this project is meant to address the present and anticipated deficiencies of I-5 only. The other elements of the regional transportation and mobility plan, and their interrelationship with the highway element, are contained in the RTP. As such this project seeks to address just one element, the highway portion, of that overall plan.

Project Objectives as specified in the Draft EIR/EIS are reiterated here, with clarifications to reflect updated project construction phasing from 2030 to 2035 and the 2050 Regional Transportation Plan (RTP) that was adopted in October 2011.

- Maintain or improve future 2035 traffic LOS as compared to existing LOS
- Maintain or improve travel times within the corridor
- Provide a facility that is compatible with future BRT and other modal options
- Provide consistency with the 2050 RTP where feasible and in compliance with federal and state regulations
- Maintain the facility as an effective link in the national Strategic Highway Network
- Protect and/or enhance the human and natural environment along the I-5 corridor

The proposed HOV/Managed Lanes would be managed to allow free-flow conditions, providing a more reliable travel time of approximately 24 minutes through this section of the corridor. The maintenance or improvement of future free-flow conditions also would support viability of I-5 as an effective link in the Strategic Highway Network. This project also supports future bus rapid transit (BRT) in the North Coast Corridor by allowing direct access through the DARs to the HOV/Managed Lanes; eliminating the need for buses to access the HOV/Managed lanes by weaving through the general purpose lanes. Travel time reliability would be more assured for all HOV/Managed Lanes users, car poolers, BRT, and when capacity allows, paying single drivers.

Excepting the references to 2035 LOS and the 2050 RTP, project analysis regarding purpose and need is consistent with that provided in the Draft EIR/EIS and is not restated here. With regard to maintenance or improvement of existing LOS through 2035 rather than 2030, the following analysis was completed.

The primary analysis tool used for a majority of the transportation planning studies in San Diego County is the San Diego Association of Government's (SANDAG's) RTP. The Transportation Model incorporates land-use plans from local jurisdictions, projected population and job growth rates, and plans for major transportation as well as other regional improvements. The combination of these factors provides a snapshot of how the region's transportation network is anticipated to behave in the future. SANDAG produces a new forecast every three to five years to incorporate updated data, changing trends, and new policies.

The traffic projections for the *I-5 NCC Project* were developed using SANDAG's Series 10 traffic model, which is consistent with the 2030 RTP. As noted above, SANDAG adopted an updated

[1] Roadway operational performance is typically described in terms of level of service (LOS). There are six levels of service, ranging from LOS A (where traffic flows freely with low volumes and high speeds) to LOS F (where traffic volumes exceed capacity and result in forced flow operations at low speeds). Each LOS represents a range of operating conditions and the driver's perception of those conditions.

RTP in October 2011, which reflects the region's latest development strategies and major transportation improvements until the year 2050. The 2050 RTP includes a revised traffic model (Series 12) which builds upon some of the assumptions that were presented in Series 10. Series 12 continues to show the I-5 North Coast Corridor as containing 4 HOV/Managed Lanes; but consistent with the LPA, assumes a minimum of 8 general purpose lanes rather than the 10 general purpose lanes assumed in Series 10. The HOV Lanes on SR-56 and the BRT along El Camino Real are now part of the 2050 RTP Revenue Unconstrained Plan.

Caltrans District 11 has reviewed and compared Series 10 and Series 12 traffic volumes for the *I-5 NCC Project*. Notably, over time (2030 to 2050), the Series 12 forecasted traffic volumes grow closer to the Series 10 2030 forecasted volumes identified in the Draft EIR/EIS. Located all along the project, from the southern to northern termini areas, the following seven locations within the project limits provide a representative sample of I-5 segments and were used to compare 2030 Series 10 and 2030 Series 12 volumes:

- La Jolla Village Drive to Genesee Avenue
- I-805 to Carmel Valley Road
- Via de la Valle to Lomas Santa Fe Drive
- Encinitas Boulevard to Leucadia Boulevard
- Palomar Airport Road to Cannon Drive
- SR-78 to Oceanside Boulevard
- Mission Road to SR-76

The results showed Series 12 traffic volumes were generally lower than Series 10 volumes by an overall average of 14.3 percent. The same comparison between 2040 Series 12 traffic volumes and 2030 Series 10 volumes show Series 12 to be generally lower overall by 8.1 percent. The comparison between 2050 Series 12 and 2030 Series 10 differed by an overall average of 0.6 percent. Because the difference between Series 10 and Series 12 decreases to almost zero over time, this does not represent a substantial change and would not impact the alternatives studied or the impacts of those alternatives.

In conclusion, although the traffic analysis included in the draft environmental documents was based on Series 10 2030 traffic forecasts, that analysis is now representative of what is expected to occur within the 2040 to 2050 timeframe.

2.1.3 Project Need

2.1.3.1 *Projected Traffic and Travel*

I-5 is the main north-south coastal corridor connecting San Diego County and Mexico with Orange County, the Los Angeles Metropolitan area, and (beyond) to the Canadian border. A critical component is the North Coast Corridor portion of I-5 that was constructed in the mid-1960s and early 1970s. Since original construction, traffic conditions have worsened while only minimal improvements have been constructed. Studies of the area show the increased demand on the route is primarily due to regional population growth, increased goods movement, increased economic growth, and greater recreational and tourism demand. Growth forecasts for San Diego County and the surrounding regions show these trends will continue. As noted in the SANDAG 2050 RTP, by the year 2050, regional population is projected to grow by 36 percent. Traffic forecasting of the region shows that if no improvements are made to I-5, traffic conditions will continue to deteriorate. This would cause impacts on route operations and

the ability to provide for the effective movement of people and goods through and within the region; and could have profound consequences within both the region and the State. Specifics cited below were provided in the *I-5 NCC Project* Draft EIR/EIS and do not comprise new information; they are restated here for the reader's reference.

As noted in the Draft EIR/EIS, in 2006 the average time required to travel from the north to south end of the project area was 31 to 44 minutes in the a.m. peak travel time and 27 to 32 minutes in the p.m. peak travel time. Without project improvements, as early as 2030[2], travel time is projected to increase to 53 to 54 minutes in the a.m. peak period and 40 to 48 minutes in the p.m. peak period. The period of time for which drivers would have to experience this congestion also would increase for both a.m. and p.m. peak travel periods; from five hours in the current condition to six hours in the future.

Similar increases would occur for northbound traffic (see *Table 2.1.1*). Year 2006 northbound peak period travel times averaged 24 to 25 minutes in the a.m. and 33 to 39 minutes in the p.m. Projected peak period travel times would slow to 29 to 37 minutes in the a.m. and 67 to 69 minutes in the p.m. There would also be an increase in duration of congestion. Congestion would change for northbound travel from existing conditions of no delay in the a.m. peak period to over three hours congestion, and increase 2006 p.m. peak period conditions of five hours congestion to six hours. These travel time forecasts all pertain to general purpose lanes. The HOV/Managed Lanes would move freely, taking approximately 24 minutes to traverse the 27-mile long corridor.

Table 2.1.1
AVERAGE TRAVEL TIME CONDITIONS (AM and PM)

Direction	Year	Conditions	Off Peak Hours Travel Time	AM Peak Hours Travel Time	PM Peak Hours Travel Time
I-5 Northbound	**2006**	Existing Conditions	24 min	24-25 min	33-39 min
I-5 Northbound	**2030**	Forecasted Conditions (No Build)	--	29-37 min	67-69 min
I-5 Southbound	**2006**	Existing Conditions	23-25 min	31-44 min	27-32 min
I-5 Southbound	**2030**	Forecasted Conditions (No Build)	--	53-54	40-48 min

[2] As noted, these trip delays were provided in the Draft EIR/EIS for year 2030 conditions. The 2050 Regional Growth Forecast also produces trip-generation forecasts for future years 2015, 2018, 2020, 2030, 2035, 2040, and 2050. Consistency between future projections and those provided in the Draft EIR/EIS is addressed in Section 2.1.2 of this chapter.

2.1.3.2 *Consistency with California Senate Bill 468 and the SANDAG RTP*

California Senate Bill 468

In 2011 California Senate Bill (CA SB) 468, Streets and Highways Code Sections 103 and 149.10 (Kehoe 2011), was signed into law following a collaborative effort among state and local stakeholders (including SANDAG, Caltrans and the California Coastal Commission [CCC]). This bill was introduced by Senator Christine Kehoe of San Diego and is directly applicable to the North Coast Corridor and the proposed project.

The intent of the legislation was to ensure that the needed transportation investments be completed in a balanced multimodal approach such that they do not compromise or diminish existing natural resources; including the coastal zone, flora and fauna, water quality, and unique views. CA SB 468 requires development of a Public Works Plan (PWP; published as a joint document with the Transportation Resource and Enhancement Program, or PWP/TREP) that will provide for an integrated regulatory review by the CCC rather than a project-by-project approval approach. The PWP shall include all of the elements of the North Coast Corridor projects to be carried out by Caltrans or SANDAG; including coastal access, highway, transit, multimodal, community enhancement and environmental restoration, and mitigation projects.

Additional key provisions in the legislation include but are not limited to:

- Concurrent construction of rail and highway bridge crossings over lagoons, unless it is determined that phased construction of lagoon bridges would be an environmentally superior alternative
- Establishment of a “safe routes to transit” program that integrates the adopted regional bike plan with transit services
- Establishment of a value pricing high occupancy toll (HOT) lane program on I-5 to be administered by SANDAG, from which revenues would be used to offset the costs of the HOT lane program as well as for improvement of transit services, and for HOV facilities
- Authorization of the CCC to utilize Section 30515 of the Public Resources Code as it relates to filing a third-party-initiated local coastal plan (LCP) amendment with the CCC for the North Coast Corridor PWP
- Recommendation of an alternative no wider than the 8+4 Buffer
- Required evaluation of traffic impacts of the proposed capacity-increasing highway project on city and county streets and roads within the coastal zone
- Requirement for Caltrans and SANDAG to provide at least two public hearings on the PWP
- Construction of all or a portion of the capacity-increasing I-5 projects concurrently with multimodal projects (see above) and environmental mitigation and enhancement projects, as specified in the PWP

The *I-5 NCC Project* LPA as described in this Supplemental Draft EIR/EIS is consistent with CA SB 468.

SANDAG RTP

During preparation of the Draft EIR/EIS, the SANDAG 2030 RTP was the approved planning document. On October 28, 2011, the 2050 RTP was adopted as the current regional transportation planning document.

The 2050 network plan incorporates five primary components: a Sustainable Communities Strategy; Social Equity; Systems Development; Systems Management; and Demand Management. These components are identified as each having "a unique yet interdependent role in creating a sustainable transportation system that improves mobility, reduces greenhouse gases, and increases travel choices for everyone in the San Diego region through 2050." The revenue-constrained network (i.e., those elements of the proposed network that can be built, operated, and maintained based on known funding sources) incorporates transit, rail, and roadway elements. SANDAG identifies this approach as the "best balance and benefits across all of the RTP goals."

The SANDAG revenue-constrained projects lists include the proposed project. From the I-5 / I-805 merge north to Vandegrift Boulevard, the proposed facility is shown with existing general purpose freeway lanes (ranging in number from 8 to 14, depending on segment), as well as the 4 HOV/Managed Lanes proposed by the LPA. Specific improvements by segment, as well as timing of those improvements, are addressed in *Section 2.3, Phased Construction*, of this chapter. In summary, however, the LPA is consistent with the 2050 RTP. No new general purpose lanes are proposed beyond those already in place. In segments with existing HOV lanes, those would be converted to HOV/Managed Lanes; and where nothing beyond the general purpose lanes currently exists, four HOV/Managed Lanes (two southbound and two northbound) would be installed. These improvements would support future regional planning related to rapid transit and are consistent with currently planned rail improvements.

2.2 PROJECT ALTERNATIVES

As detailed in the Draft EIR/EIS, four build, and one No Build, alternatives were proposed as possible actions. Each of these alternatives is summarized in *Section 2.2.3* below, after discussion of design features and community enhancements common to all build alternatives.

2.2.1 Design Features Common to All Build Alternatives

All build alternatives would have the following design elements:

- One HOV/Managed Lane in each direction from La Jolla Village Drive to just north of Lomas Santa Fe Drive
- Two HOV/Managed Lanes in each direction from just north of Lomas Santa Fe Drive to Harbor Drive/Vandegrift Boulevard
- Separation of general purpose lanes from HOV/Managed Lanes from near La Jolla Village Drive to Del Mar Heights Road and from SR-78 to near Harbor Boulevard by a buffer varying in width up to five feet
- Provision of a continuous HOV lane in each direction through the I-5 / I-805 junction with a freeway-to-freeway connector (flyover), crossing over the I-5 / I-805 merge and connecting the proposed project HOV/Managed Lanes to existing HOV lanes just north of that merge
- DARs from grade-separated interchanges into Managed Lanes, thereby allowing direct access to the HOV/Managed Lanes without weaving across general-purpose lanes at Voigt Drive and Manchester Avenue. The DARs are compatible with carpools, bus transit, and value pricing and would support HOV/Managed Lanes. Both of these facilities have also been redesigned since circulation of the Draft EIR/EIS to minimize environmental impacts

- Intermediate access points (IAPs) or at-grade access located near Carmel Mountain Road, Del Mar Heights Road-Via de la Valle, Lomas Santa Fe Drive, Santa Fe Drive, Poinsettia Lane, Tamarack Avenue, and Oceanside Boulevard; and access points at the ends of HOV/Managed Lanes at La Jolla Village Drive and Harbor Drive
- Intelligent Transportation System (ITS) components, such as toll collection equipment, to allow SOV users to purchase use of HOV/Managed Lanes (including overhead suspended scanner devices such as gantries, traffic monitoring stations, ramp meters, closed circuit television [CCTV] to view traffic on the facility and to help manage the traffic, changeable message signs [CMSs] to display the tolls, and loop detectors to measure traffic volume and speed)
- Twelve-foot-wide auxiliary, acceleration, and deceleration lanes (as needed in 14 locations; 5 southbound, 4 northbound and 5 both north- and southbound) and 10- to 12-foot-wide shoulders
- New park and ride facilities at Manchester Avenue and SR-76, and enhanced park and ride facilities at other locations
- Reconfiguration of various local interchanges to improve vehicular, pedestrian and bicycle circulation at northbound ramps for Leucadia Boulevard and La Costa Avenue; at southbound ramps for Roselle Street, Manchester Avenue, Encinitas Boulevard, Palomar Airport Road and Oceanside Boulevard; and at both north- and southbound ramps at Genesee Avenue, Del Mar Heights Road, Via de la Valle, Birmingham Drive, Santa Fe Drive, Tamarack Drive, Carlsbad Village Drive, Mission Avenue, SR-76, and Harbor Drive, as detailed on *Table 2.1* of the Draft EIR/EIS
- Redesign of lagoon bridges at Peñasquitos, San Dieguito, San Elijo, Batiquitos, Agua Hedionda, and Buena Vista Lagoons, with a minimum width of 194 feet (97 feet on either side of centerline)
- Ramp metering at various on-ramps (with ultimate metering at all 58 on-ramps at buildout), retaining walls (to reduce property acquisition needs, stabilize slopes, minimize impacts and accommodate engineered structures), barriers, guard rails/end treatments, crash cushions, bridge rails, and signage, installed as appropriate and as needed
- Project-related drainage abandonment or improvement including extension, replacement or lining, with new drainage facilities constructed adjacent to cross roads (facility examples include storm drain inlets, storm ditches, rock slope protection, and headwalls)
- Relocation of existing overhead or underground utilities (water, sewer, gas, electricity telephone, and other communications), as needed and within existing utility easements, as possible
- Proposed sound barriers as described in the Draft EIR/EIS with specifics dependent on final design

Placement of common design features with overhead elements such as highway signs, ITS components, etc. would be determined during final design. Where these features would be in proximity to lagoons (and could therefore provide raptor roosting locations in proximity to lagoon habitat or sensitive species), placement would be designed in coordination with the wildlife agencies.

2.2.1.1 Bridges

As a result of optimization review explored in *Chapter 3* of this document, changes have been identified for I-5 bridge designs. The proposed bridge lengths are recommended as a result of the Bridge Length Optimization Study and are included in the project as an enhancement

component. These modifications are detailed in *Chapter 3* on lagoon bridge options summary analyses tables prepared for each lagoon crossed by I-5. In summary, however, new bridges are now proposed at Agua Hedionda, San Elijo, Batiquitos, and Buena Vista Lagoons, with longer bridges proposed at the latter three lagoons. Refinements in bridge widths have been provided for the LPA. A comparison of existing and currently proposed bridge lengths is shown on *Table 2.2.1*.

Table 2.2.1
I-5 BRIDGE DIMENSIONS (IN FEET)

Bridge Structures	Bridge Dimensions				Notes
	Existing Dimensions		Proposed Project		
	Length	Width	Length	Width	
Los Peñasquitos Lagoon	--	--	--	--	--
Los Peñasquitos Creek[1]	NA[4]	NA[4]	3,609	60	--
Carmel Creek[2]	421	179	421	194	Bridge would be widened to the west
Sorrento Valley[3]	NA[4]	NA[4]	443	36	--
San Dieguito Lagoon	650	179	650	258	Bridge would be widened to the west and east
San Elijo Lagoon	340	157.5	603.1	288-353.6	Width in bridge varies due to Manchester Avenue on- and off-ramps. Bridge supports would include 5 rows of 32 columns each
Batiquitos Lagoon	219	2 68-ft bridges w/ a 19.2-ft gap	282	2 122-ft bridges w/ a 19.2-ft gap	Bridge supports would include 2 rows of 10 columns each
Agua Hedionda Lagoon	191	157.5	191	269	--
Buena Vista Lagoon	102.4	184	197	336	Bridge supports would include 2 rows of 32 columns each

[1] Flyover bridge
[2] Main I-5 bridge
[3] Bicycle bridge
[4] NA = The is no existing bridge at this location

2.2.1.2 *Regional and Community Enhancements Common to All Build Alternatives*

Natural and human community enhancements were developed in conjunction with the local cities and would be implemented during project construction. Development of the community enhancement projects proposed in the *I-5 NCC Project* followed an extensive "Context Sensitive Design" approach. Context sensitive design encourages increased public participation in the making of final design decisions. The three areas of focus in context sensitive design include: actively seeking public involvement throughout the design process; developing designs that meet the needs of specific sites, rather than standardized solutions; and providing flexibility in typical design approaches if environmental, historic, and neighborhood concerns can be resolved through the implementation of a unique solution.

Identification of community enhancements was based on local input, as summarized here. Two documents chronicle in detail the development of the enhancement projects proposed with the *I-5 NCC Project*, which included extensive community involvement to identify the appropriate opportunities to include improvements in the corridor and the locations for these projects. First, the I-*5 North Coast Community Enhancement Plan* presents the proposed enhancement projects for each city. Second, the *I-5 North Coast Community Enhancement Plan Project Notebook* documents the methodology and the decision-making process. These documents work together to describe the reasoning and conceptual design for these projects. *Table 2.2.2, Community Enhancements Information*, provides a summary of the information contained in the community enhancement plan documents, as well as detailed information regarding potential environmental impacts associated with community enhancement implementation. This large table is located at the back of this chapter.

Although the process varied by city and their preference, identification of community enhancements began in 2005 with meetings with city staff, followed in 2006 by additional city meetings, as well as meetings with community planning groups, community input meetings open to the public overall, and/or city council hearings on the topic. Based on public input, potential enhancement projects were identified as most or least appropriate based on community votes and comments received at the community meetings in San Diego, Encinitas, Carlsbad, and Oceanside.

Following public comments received on the Draft EIR/EIS, as well as continued agency and city coordination on community enhancement particulars, some changes were made to enhancements previously proposed. These include the:

- Modification of the Del Mar Heights pedestrian overpass connection to connect to the proposed North Coast Bikeway on the west
- Deletion of the Nature Center at La Costa Avenue and associated southern trail
- Removal of Chestnut Avenue street enhancements as a community enhancement and incorporation as part of project design

The "North Coast Bikeway" (NC Bikeway) has been added as a regional enhancement in *Table 2.2.3* also located at the back of this chapter. This bikeway would complement the "Coastal Rail Trail" and the "El Camino Bicycle Corridor," as well as the "California Coastal Trail." The NC Bikeway is a new facility concept developed to support non-motorized travel. There would be portions within Caltrans right-of-way, rail right-of-way, and local jurisdictions. Caltrans and SANDAG are working with the appropriate jurisdictions to ensure that the NC Bikeway is consistent with local bike plans. Connections to these local bikeways and regional bicycle corridors are necessary to promote safe bicycling in the corridor, as well as to create

new neighborhood connections, provide enhancements to existing corridors, and connect to regional and inter-regional bicycle facilities. The *I-5 NCC Project* proposes to provide bicycle/pedestrian crossings that currently do not exist at the lagoons along the I-5 corridor and would connect with the existing non-motorized facilities.

An overview of community enhancements currently proposed is shown on *Figures 2-2.1a* and *2-2.1b.* Community enhancement inclusion for all build alternatives is dependent upon reaching a Maintenance Agreement with the affected city. Typical configurations of lagoon vicinity trails and suspended pedestrian/bike trail segments are shown on *Figures 2-2.2* and North Coast Bikeway (NC Bikeway) elements located within Caltrans right-of-way and included in analysis for project impacts are shown on *Figures 2-2.4a* through *2-2.4*j highlighted in yellow with red. Right-of-way requirements, grading footprint, and potential retaining walls are addressed in *Chapter 3* of this Supplemental Draft EIR/EIS (for enhancements located adjacent to lagoons crossed by I-5) and/or will be addressed in the Final EIR/EIS.

The proposed community enhancements have undergone analysis to evaluate their environmental effects. The information regarding the analysis is summarized in *Chapter 3* of the Draft EIR/EIS and detailed in the supporting technical studies. The information in *Table 2.2.2* has been prepared to highlight key information from the Draft EIR/EIS and technical studies prepared for the *I-5 NCC Project*. The information reflects a systematic site selection process, which was followed to identify sites that would (1) be within existing and/or proposed Caltrans right-of-way, (2) be located in areas such that they would have negligible potential environmental impacts beyond those already identified as part of I-5 construction, and (3) conform to existing infrastructure and approved planning, with support from the communities to provide benefits for the local communities adjacent to the I-5 freeway. The community enhancements were included within the overall project evaluation of 22 technical study issues addressed in *Chapter 3* analyses of the Draft EIR/EIS under human, physical and biological environment. For the reader's convenience, important footprint benefits and impacts specific to each enhancement have been summarized on *Table 2.2.2;* including impacts and benefits specifically related to land use, community, transportation, air quality, visual/aesthetics, and biological resources, as appropriate. Names of the enhancements on *Table 2.2.2* reflect those on *Figures 2-3.1a* through *2-3.1c* so the reader can easily locate the improvement location.

Enhancements that would be implemented following completion of a Maintenance Agreement with the relevant city, as well as their benefits, and identified impacts are presented in *Tables 2.2.2* for community enhancements and *Table 2.2.3* for the NC Bikeway. Both of these tables are located at the back of this section.

2.2.1.3 *Other Common Features*

The project includes numerous individual design elements, which are described in detail in Draft EIR/EIS *Section 2.2.1*. Such features include ramp meters, utility relocations, noise barriers, retaining walls, drainage and water treatment features, auxiliary lanes, and signage. Because the majority of these features would be located within areas required for modification as part of the I-5 through lanes footprint, they would not, in and of themselves, result in substantial environmental impacts. Features common to all alternatives that would individually result in potentially substantial environmental impacts include bridges, braided ramps, DARs, and certain auxiliary lanes. Project bridges and proposed improvements are discussed in detail in *Chapter 3* of this document. DARs, braided ramps, and auxiliary lanes are described below, followed by focused feature tables (*Tables 2.2.4* through *2.2.6*, located at the back of this chapter), which

summarize feature location, justification for proposed inclusion in the project, potential impacts, and proposed avoidance, minimization, and mitigation measures.

DARs are grade-separated facilities that enable direct access to HOV/Managed Lanes from a local street, arterial or an adjacent park-and-ride facility. DARs improve freeway operations, reduce congestion, save time, promote use of alternative modes of transportation, and increase travel time reliability for both HOV/Managed Lane traffic and general-purpose freeway traffic. By enabling HOVs (e.g., transit and carpools) and permitted single-occupancy vehicles (SOVs) to connect directly with the HOV/Managed Lanes, these vehicles avoid the need to weave across the general-purpose lanes of traffic, thus improving freeway operations for all users. Project DARs are addressed on *Table 2.2.4,* located at the back of this chapter.

A **braided ramp** is a design feature in which two ramps are grade-separated. They cross over and under each other to avoid vehicles coming from an on-ramp having to weave through vehicles traveling towards the next off-ramp. Braided ramps are addressed on *Table 2.2.5*, located at the back of this chapter.

Auxiliary lanes are defined in The Caltrans Highway Design Manual (HDM) as the portion of roadway used for weaving, truck climbing, speed change, or for other purposes supplementary to through traffic movement. The American Association of State Highway and Transportation Officials (AASHTO) additionally notes auxiliary lanes as the portion of the roadway adjoining the traveled way for speed change, turning, storage for turning. In a freeway environment, auxiliary lanes may be provided downstream of an entrance ramp to accommodate merging traffic, upstream of an exit ramp to accommodate diverging traffic, or between two closely spaced interchanges to accommodate weaving traffic. They reduce turbulence in the traffic stream due to lane changing and changes in speed (including lower average speeds). In addition, auxiliary lanes may be carried through one or more interchanges to serve one or more of the listed purposes. Auxiliary lanes help reduce congestion due to weaving traffic, and are addressed on *Table 2.2.6*, located at the back of this chapter.

2.2.1.4 *Design Changes Due to Impact Avoidance and Minimization*

In addition to consideration of what project improvements are needed along the I-5 corridor (see *Section 2.1.3, Project Need*), evaluation of the potential for avoiding and reducing impacts has also been an ongoing process. Throughout project design, the project development team has been reviewing opportunities for avoidance and minimization of potential project impacts. This has included shifts in facility location as well as redesign (and in some cases, even elimination) of potential project features. Elements taken into consideration for each of the major project features (DARs, braided ramps, and auxiliary lanes) presented on *Tables 2.2.4* through *2.2.6.*

Specific to revisions made following receipt of comments on the Draft EIR/EIS, redesign of the Manchester DAR resulted in reduction of anticipated visual impacts. The visual impact associated with I-5 in the vicinity of this interchange was identified as “high” in the Draft EIR/EIS based on the bridges, large terrain-contour retaining walls, loss of trees and provision of a bus platform and parking lot for 400 cars within a scenic area, combined with anticipated viewer response. As noted, redesign changes include elimination of an overcrossing and integration of a DAR undercrossing, the reduction from Draft EIR/EIS proposed parking from approximately 400 to 150 spaces, and commitment to pervious hardscape. The revised DAR footprint and park and ride illustration is depicted on *Figure 2-2.5*.

Also since circulation of the Draft EIR/EIS, two DARs, located at Cannon Drive in the City of Carlsbad and Oceanside Boulevard in the City of Oceanside, have been eliminated from the proposed project.

Originally proposed based on interest from the cities for DARs for these locations, over time it has become clear that either: (1) funding is not certain, and/or (2) decisions as to future land uses in these areas are still under consideration. Deletion of these DARs from the current proposed project allows for further consideration of these locations by the cities, without eliminating the possibility of future implementation of I-5 DARs at these, or other, locations within these cities following additional environmental review. Elimination of the DARs would not adversely affect traffic flow as described in the Draft EIR/EIS.

As noted in *Section 2.2.1.1*, proposed bridge lengths have been revised as an enhancement component to optimize lagoon function. Improvements to wildlife crossings have been further clarified and incorporated into project design at five of the lagoons (excepting San Dieguito). Bike/pedestrian path improvements also have been clarified for each of the crossed waterways, including incorporation of additional detail regarding bike/pedestrian paths suspended from I-5 bridges. All bike/pedestrian paths would be 12 feet wide or less. While design has not been finalized, co-located bike/pedestrian paths are anticipated to consist of an eight-foot wide paved bike path with an adjacent soft-surface trail for pedestrians. As no bikes are allowed in the ecological reserves adjacent to most of the lagoons, the paths through these areas would be for pedestrian use only (see *Figure 2-2.6* for an example sign.[3]) The reader is referred to *Tables 2.2.2* and *2.2.3,* and *Chapter 3* for detail on each of these features.

2.2.1.5 *Project Design Measures to Benefit Regional Air Quality*

One of the key objectives of the *I-5 NCC Project* is to improve the efficient regional movement of people and goods, averting future conditions associated with substantial gridlock on the facility. Improvement of traffic flow, along with provision of improved bike/pedestrian facilities as community enhancements, would improve regional air quality once in operation. As a result, even considering the potential for increased freeway travel (latent demand), the project would be consistent with regional air quality conformity goals. The anticipated operational air pollutant emissions improvements, including potential offsets resulting from increased demand for freeway travel, are described in Project Operations and Community Enhancements, following Project Construction. Construction of the facilities would result in short-term air pollutant emissions, as described immediately below.

Project Construction

As discussed in *Section 3.14.3* of the Draft EIR/EIS and Section 5.2 of the Air Quality Study (August 2007), the principal criteria pollutants emitted during construction would be particulate matter sized 10 microns and under (PM_{10}) and particulate matter sized 2.5 microns and under ($PM_{2.5}$). The source of the pollutants would be fugitive dust created during clearing, grubbing, excavation, and grading; demolition of structures and pavement; vehicle travel on paved and unpaved roads; and material blown from unprotected graded areas, stockpiles, and haul trucks.

A secondary source of pollutants during construction would be the engine exhaust from construction equipment. The principal pollutants of concern would be nitrogen oxides (NO_X),

[3] This sign provides a sample format. Caltrans would work with the agency/foundation that controls each lagoon to develop signs that meet the specific needs at that location.

reactive organic gases (ROG), and volatile organic compounds (VOC) emissions that would contribute to the formation of ozone (O_3), which is a regional nonattainment pollutant.

Potential construction-period air quality impacts would result from construction activities associated with segment widening, mainline bridge construction, and overcrossing/ undercrossing construction. In addition, minimal air quality impacts could occur from construction of the proposed regional and community enhancement projects. Construction of the majority of the enhancements would occur within the project's construction footprint and these were accounted for within the construction emissions budget identified in the Draft EIR/EIS and the Air Quality Study (August 2007). Grading, paving, and landscaping for these features would be accomplished in conjunction with the freeway project. These enhancements include the following:

<u>San Diego</u>

- Del Mar Heights Pedestrian Bridge – The structure crossing over I-5 would be within the construction footprint
- Los Peñasquitos Creek bike/pedestrian path connection – Within the construction footprint under the existing structures in the Sorrento Valley Area connecting to Vista Sorrento Road sidewalk
- Carmel Valley Road bike/pedestrian path connection – Under the existing structures at I-5 / SR-56
- Enhanced park and ride at Carmel Valley Road – Existing park and ride lot I-5/Carmel Valley Road
- North Coast Corridor bikeway – Along the freeway slopes within right-of-way

<u>Solana Beach</u>

- Streetscape Enhancements on Ida Avenue – Within the construction footprint for noise barrier along Ida Avenue
- North Coast Corridor bikeway – Along the freeway slopes

<u>Encinitas</u>

- Enhanced bike/pedestrian path on both sides of I-5 at San Elijo Lagoon with bridge connection to Manchester Avenue – Along the freeway right-of-way
- Park and ride enhancements at Birmingham Drive – Landscaping within the existing park and ride lot
- Villa Cardiff Drive and MacKinnon Bridge Enhancements – Landscaping, sidewalk/path connection from Villa Cardiff across new MacKinnon Bridge
- Santa Fe Drive bike/pedestrian path enhancements – Path at traffic circle, signage, and landscaping
- Hall Property Park bike/pedestrian path connection to Santa Fe Drive – Path, signage and landscaping
- Encinitas Boulevard Bicycle/Pedestrian Enhancements
- Union Street pedestrian overpass – Pedestrian crossing of I-5 connecting to Union Street
- North Coast Corridor bikeway – Along the freeway slopes

Carlsbad

- Enhanced bike/pedestrian path and bridge on west side of I-5 at Batiquitos Lagoon
- Park and Ride enhancement at La Costa Avenue – Reconfiguration of existing park and ride and landscaping
- Trail on northeast side of I-5 at Batiquitos Lagoon
- Enhanced bike/pedestrian trail and bridge on east side of I-5 at Agua Hedionda Lagoon – Within construction footprint connecting to existing trails
- North Coast Corridor bikeway – Along the freeway slopes

Oceanside

- Pocket park and pedestrian path at California Street – Remnant parcels from freeway construction to be reclaimed for park and pedestrian route to schools
- Oceanside Boulevard pedestrian streetscape enhancement – Widen existing sidewalks and landscaping
- Division Street bike/pedestrian enhancements – Widen existing sidewalks and landscaping
- Mission Avenue bike/pedestrian enhancements – Widen existing sidewalks, realign pedestrian crossing signals, and landscaping
- Bush Street bike/pedestrian enhancements and community gardens – Expand existing sidewalks and landscaping
- North Horne Street community open space park and/or community gardens – Remnant parcels from freeway construction to be reclaimed for community gardens
- SR-76 recreational parking/staging area – New parking and trailhead within existing right-of-way/abandoned loop ramp
- Pedestrian underpass improvements north of San Luis Rey River at San Luis Rey Drive – Add lighting and stairs to existing path

A small number of community enhancements would occur outside the retained Caltrans right-of-way. These include the following:

- Del Mar Heights Pedestrian Bridge connection to local street
- Old Sorrento Valley Road enhanced bike/pedestrian path connection from Carmel Valley Road to Carmel Mountain Road
- Enhanced bike/pedestrian path and bridge on west side of I-5 at San Dieguito Lagoon
- Pedestrian trailhead at Solana Hills Drive
- Bike/pedestrian path connection from Santa Fe Drive to Requeza Street with wetland revegetation
- Bike/pedestrian path connection from Requeza Street to Encinitas Boulevard
- Cottonwood Creek Park to Union Street bike/pedestrian path connection with wetland revegetation
- Regional gateway Feature at Harbor Drive – Add sculpture to existing gateway
- Harbor Drive/Camp Pendleton bike/pedestrian path enhancements

Construction emissions are assessed against the general conformity *de minimis* emission limits used to determine conformity with existing air quality plans. The *de minimis* limit for carbon monoxide (CO) in an area under a maintenance plan is 100 tons per year. The *de minimis* limits for O_3 (8-hour) basic nonattainment are 100 tons per year for both NO_X and VOC. The

federal *de minimis* limit for PM_{10} nonattainment is 100 tons per year. Although the San Diego Air Basin is not a federal nonattainment area for PM_{10}, it is a state nonattainment area; therefore, use of this limit would represent a conservative threshold.

Based on the size of each enhancement, the anticipated emissions generated from the implementation of the community enhancement projects would be extremely low. Information on the construction emissions of the proposed project is summarized here from the Draft EIR/EIS to provide context for the analysis of emissions associated with the construction of the community enhancement projects.

A detailed inventory of construction equipment used for the proposed project was not available due to the early stage of design; therefore, the analysis was based on default construction equipment assumptions developed for the Road Construction Model from other road construction and improvement projects. Construction emissions were estimated by using the Road Construction Model, version 5.1[4].

Table 9 of the Air Quality Study (August 2007), shows that the total construction-related emissions of up to 6.6 linear miles per year of roadway widening and mainline bridge construction simultaneously would be below the *de minimis* limits. This assumed the 10+4 alternative with two auxiliary lanes (the largest of the potential alternatives). The analysis showed that, with these conservative assumptions, construction would result in the following emissions per year: 2.7 tons of VOC, 17.7 tons of NO_X, 20.9 tons of CO, and 4.0 tons of PM_{10}. Based on these calculated emissions, construction activities limited to approximately 6.6 miles of construction of roadway widening and bridge work simultaneously in the region would not have a substantial impact on air quality. Placed in this context, it can be seen that the construction of the much smaller community enhancement projects also would not have a substantial impact on air quality.

Project Operations and Community Enhancements

As detailed in *Section 3.14, Air Quality*, of the Draft EIR/EIS, the project build alternatives are designed to maintain or reduce travel time through reduction in traffic congestion along the I-5 corridor. As a result, they would improve air quality impacts associated with existing conditions. Over time, these improvements would be partially offset by the increase in the number of vehicles using the roadway.

Given the forecasted population growth (an additional one million people by 2040) in the region, traffic projections indicate that Vehicle Miles Traveled (VMT) on I-5 will increase approximately 29 percent over the next 30 years (refer to Corridor System Management Plan [CSMP] Figure 4.7). This increase in travel demand is expected to occur even if capacity is not increased on I-5.

With the addition of the four (maximum) HOV/Managed Lanes (express lanes), VMT is expected to increase an additional four percent (refer to CSMP Figure 4.7) above “no-build” projections. This minor additional increase is associated with the potential for the project improvements to induce

[4] The Road Construction Model is a public domain spreadsheet model formatted as a series of individual worksheets. The model enables users to estimate emissions using a minimum amount of project-specific information. The model estimates emissions for load hauling (on-road heavy-duty vehicle trips), worker commute trips, construction site fugitive PM_{10} dust, and off-road construction vehicles.

people to travel I-5 who would not otherwise do so (e.g., by making I-5 more convenient than their existing alternate routes). This phenomenon is sometimes referred to as "latent demand."

The projected increase of VMT for the build alternatives is relatively small (four percent) as a result of a number of regional and project strategies/improvements designed to reduce the growth of VMT, and to encourage options to the use of single-occupant vehicles. These include:

- Proposed community enhancements include bike and pedestrian facilities designed to significantly expand and improve the functionality of the existing bicycle and pedestrian system
- The express lane system is designed to provide a competitive option to single-occupant vehicles by ensuring a reliable, congestion-free travel option throughout the corridor for carpools, vanpools, and buses. In doing so, the corridor would move more people per VMT
- The express lane system includes a congestion pricing element, designed to allow solo drivers to use the Express Lanes only by paying a fee, using the region's FasTrak® system. Fee revenue generated through FasTrak® would support transit within the corridor
- In addition to the construction of the express lanes, the region is concurrently working to significantly expand commuter and interregional rail services. Much like the express lanes, these improvements are designed to provide a competitive option to single-occupant vehicles
- The three-pronged Transportation Demand Management (TDM) strategy includes outreach, education and incentives to reduce solo driving through improved van pools, carpools, telework, and bicycle programs
- SANDAG is working to minimize urban sprawl, through the implementation of Sustainable Community Strategies (SCS). These strategies result in 80 percent of San Diego's new homes and jobs being planned in areas to be served by the region's Urban Area Transit Strategy (refer to 2050 RTP page 3-6). Additionally, of the 388,000 homes planned in the region by 2050, 85 percent are planned as multi-family homes (refer to 2050 RTP Appendix 7)

Lastly, the *I-5 NCC Project* includes a number of operational and transportation system management (TSM) improvements (e.g., ramp meters, vehicle detection, and changeable message signs), designed to maximize the efficiency of the existing system and to provide improved traveler information. These key project elements would improve air quality by reducing overall congestion levels and further minimizing the impact of added VMT.

While VMT increases are not necessarily desirable due to potential emissions and fuel consumption impacts, freeway VMT is only one component of the air quality analysis. In this case, the four percent VMT increase related to latent demand would be more than offset by increased vehicle speeds (reduced congestion) and decreases in VMT on local arterials. Specifically, construction of the four (maximum) HOV/Managed Lanes (express lanes) would provide the following air quality-related benefits when compared to the No Build alternative:

- A 10 to 15 percent reduction in VMT on El Camino Real and Pacific Coast Highway (refer to CSMP Figure 8.26)
- A 47 percent reduction in Vehicle Hours of Delay (VHD) (defined as 35 miles per hour or less; refer to CSMP Table 8.8)
- A decrease in the duration of daily peak period congestion from a range of 12 to 13 hours to a range of 5 to 6 hours (refer to CSMP Table 8.10)

2.2.2 Build Alternatives

2.2.2.1 *Draft EIR/EIS Proposed Build Alternatives*

Four build alternatives were described in the Draft EIR/EIS. These alternatives proposed:

- Up to 10 general purpose lanes (lanes available to all users of the facility) where fewer lanes currently exist
- Two managed lanes (lanes restricted to vehicles, motorcycles and buses with multiple passengers or to single passengers paying an access fee) going both north and south
- Auxiliary lanes (to facilitate weaving) as necessary

Potential use of permanent barriers or open buffers between the general purpose and HOV/Managed Lanes also formed elements of these alternatives. Details regarding those alternatives were graphically depicted in the June 2010 Draft Project Report, which provided detailed layout exhibits for each alternative. The Project Report is available for review at www.keepsandiegomoving.com. For the reader's convenience in use of this Supplemental Draft EIR/EIS, primary features of the alternatives are summarized below. Costs for the build alternatives identified below are consistent with those presented in the Draft EIR/EIS. These costs will be verified prior to completion of the Final EIR/EIS; at which time costs will also reflect refined design for the LPA, including the elimination of two DARs.

10+4 Barrier

The 10+4 Barrier alternative would build one general-purpose lane in each direction on I-5 from south of Del Mar Heights Road in San Diego to SR-78 in Oceanside. Two HOV/Managed Lanes would be built in each direction from north of the I-805 / I-5 freeway-to-freeway connector in San Diego to Harbor Drive/Vandegrift Boulevard in Oceanside.

This alternative would separate HOV/Managed Lanes from general-purpose lanes with a concrete barrier. This physical barrier would require standard 10-foot emergency shoulder widths on either side of it from north of Del Mar Heights Road to south of SR-78. A variable buffer of up to four feet in width identified by painted stripes would separate HOV/Managed Lanes from general-purpose lanes from Voigt Drive to Del Mar Heights Road and from SR-78 to Harbor Drive/Vandegrift Boulevard. The projected cost (right-of-way, support, and construction) for this alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $4.3 billion.

10+4 Buffer

The 10+4 Buffer alternative would add the same number of through lanes (one general purpose and two HOV/Managed in each direction) and function similarly to the 10+4 Barrier alternative, but would use a painted buffer with a width of up to four feet to separate HOV/Managed Lanes from general-purpose lanes for the entire length of the project. The projected cost (right-of-way, support, and construction) for the alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $3.5 billion.

8+4 Barrier

The 8+4 Barrier alternative would not add any general purpose lanes to the existing highway. Two HOV/Managed Lanes would be added in each direction, separated from general purpose lanes as described above for the 10+4 Barrier alternative. This physical barrier would require

standard 10-foot emergency shoulder widths on either side of it from north of Del Mar Heights Road to south of SR-78. A variable buffer of up to four feet in width identified by painted stripes would separate HOV/Managed Lanes from general-purpose lanes from Voigt Drive to Del Mar Heights Road and from SR-78 to Harbor Drive/Vandegrift Boulevard. The projected cost (right-of-way, support, and construction) for this alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $4.1 billion.

8+4 Buffer

The 8+4 Buffer alternative would not add any general purpose lanes to the existing highway. It would function similarly to the 8+4 Barrier alternative but would separate HOV/Managed Lanes from general-purpose lanes with a variable painted buffer (up to four feet in width) for the entire length of the project in lieu of the barrier. The projected cost (right-of-way, support, and construction) for this alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $3.3 billion.

2.2.2.2 *Locally Preferred Alternative (LPA)*

Rationale for Identifying the LPA

The LPA (I-5 Express Lanes) is the 8+4 Buffer alternative. In general, that alternative would require less right-of-way, resulting in the least or lowest impacts of all the build alternatives for the issues of:

- Park and recreational facilities
- Farmland
- Floodplain effects related to roadway widening, fill slopes, and bridge column impacts into waterways
- Sensitive species' critical habitat
- Permanent effects to sensitive upland habitats
- Permanent effects to sensitive wetland habitats (including eelgrass)
- Permanent effects to jurisdictional waters
- Sensitive individual plants
- Section 4(f) resources
- Residential and business displacement
- Increase in impervious area

This alternative also allowed for the largest available space for water quality treatment.

The LPA (right-of-way, support, and construction in 2010 dollars) was projected to cost approximately $3.3 billion. Updated and verified costs reflecting refined design for the LPA, including the elimination of two DARs, will be provided in the Final EIR/EIS.

Project Configuration for the LPA

As noted above, the LPA is a refined 8+4 Buffer alternative. Refinements to the project and alternative since circulation of the Draft EIR/EIS are detailed in *Table S.1*, above, and summarized below.

- Reduction in right-of-way requirements
- Revisions to lagoon bridges and channel improvements

- Elimination of DARs at Cannon Road and Oceanside Boulevard
- Refinement of the Manchester Avenue DAR to eliminate a flyover, implement an undercrossing and reduce the amount of parking
- Addition of the NC Bikeway
- Addition of California Highway Patrol cross-over/turn facilities

The LPA configuration is depicted on *Figures 2-2.7a* through *2-2.7c*. These feature maps schematically depict lanes (including general purpose lanes, HOV/Managed Lanes, auxiliary lanes), direct access ramps, bridge locations and I-5 over- and under-crossings, as well as best management practices (e.g., bioswales). A schematic cross-section of the LPA is provided in *Figure 2-2.8*). Schematic locations of proposed bioswales are illustrated on Figure *2-2.9*.

Detailed mapping of the lagoon crossings is provided on (*Figures 2-2.10a* through *2-2.10f*). Cross-sections for each of the lagoon crossings (depicting both existing and proposed structure and channel information) are located in *Chapter 3* (*Figures 3-1.1b* through *3-1.6b*), with the detailed discussions of those features for each lagoon. Locations of proposed noise barriers (ultimately dependent on final design, reasonableness allowance, and residents' acceptance) are unchanged from those shown in the Draft EIR/EIS. Refined analyses associated with these LPA modifications with regard to lagoons are included in *Chapter 3* of this Draft Supplemental EIR/EIS. Updates to other technical analyses will be provided in the Final EIR/EIS, as appropriate.

2.2.3 No Build Alternative

Proposed project improvements consisting of the four HOV/Managed Lanes, DARs, IAPs, auxiliary lanes, drainage upgrades, bridge improvements, community enhancements, etc., would not be constructed under the No Build alternative. The existing multipurpose lanes (generally four in each direction) and the configuration of most of the intersections along the corridor would remain in their current condition. Ongoing operations and routine maintenance would continue. The No Build Alternative offers a basis of comparison with the build alternatives. Although proposed project improvements would not be implemented, a number of interchange/operations/rail projects separately proposed and cleared under other CEQA/NEPA environmental documents would potentially move forward. The following is a list of those projects:

- I-5 / SR-56 Interchange Improvements
- I-5 / SR-78 Interchange Improvements
- I-5 "Mid-Coast" Freeway Improvements (10+2 HOV facility from I-8 to I-805)
- I-805 "North" improvements (8+4 HOV/Managed Lanes facility from SR-52 to north of Mira Mesa Boulevard in San Diego)
- Sorrento Valley Road/Roselle Street Improvements
- Manchester Avenue Interchange Improvements
- Encinitas Boulevard Interchange Improvements
- Birmingham Avenue to Leucadia Boulevard Auxiliary Lanes
- LOSSAN Rail Improvements (double tracking of rail corridor between Los Angeles and San Diego)

Without the proposed additional through lanes on I-5, however, the anticipated increase in traffic volumes would be expected to result in additional congestion with longer delays. Proposed improvements related to pedestrian and bike paths would not occur. Similarly, improvements to

the planned transit system would not be supported without the project DARs and HOV/Managed Lanes. The No Build alternative, therefore, would not meet the project's purpose and need.

2.3 PHASED CONSTRUCTION

Phasing of the proposed project has been reviewed and refined following circulation of the Draft EIR/EIS. Critical to project scheduling is the overall implementation framework that coordinates the timing of rail, highway, and resource-enhancement project components. Consistent with CA SB 468, this would ensure that I-5 improvements do not outpace other multi-modal transportation improvements planned for the I-5 North Coast Corridor as discussed in *Chapter 1*, and that proposed transportation improvements do not outpace natural resources restoration and enhancement, as detailed in Chapter 6.0 of the project PWP/TREP. Project impacts would not occur in advance of project mitigation – mitigation would occur prior to or concurrent with impacts. (Please see *Sections 3.1.2* and *3.1.3* of this document for detail on phasing of project elements with regard to lagoon crossings and mitigation implementation prior to impact actions.) Elements by phase are consistent with the 2050 RTP and are depicted on *Figures 2-3.1a* through *2-3.1c*.

The current plan anticipates construction beginning as early as 2014, with completion of all project elements by 2035. Over this three-decade period, the following actions are anticipated.

By Year 2020:

- The I-5 segment from Manchester Avenue to SR-78 would be improved to include two HOV/Managed Lanes. This first phase also would include the replacement of the San Elijo Lagoon Bridge and implementation of the Manchester DAR
- The I-5 segment from La Jolla Village Drive to the I-5 / I-805 merge would be improved to include two HOV/Managed Lanes. This improvement also would include the Voigt DAR and HOV connectors
- Community enhancements including the Los Peñasquitos Creek trail connection, bike/pedestrian path on both sides of San Elijo Lagoon with a bridge connection to Manchester Avenue, Villa Cardiff and MacKinnon Avenue bridge enhancements, and Santa Fe Drive bike/pedestrian improvements, Encinitas Boulevard bike/pedestrian enhancements, and NC Bikeway in Encinitas and Carlsbad
- Environmental enhancement actions including continued work on San Elijo Lagoon planning/restoration and the ongoing San Dieguito River Valley planning/restoration site; restoration at the Deer Canyon II Site; new work on planning/restoration at the Hallmark Site, Dean Family Trust, and Buena Vista Lagoon Sites; and preservation at the Laser Preservation and La Costa Preservation sites

By Year 2030:

- I-5 segments from the I-5 / I-805 merge to Palomar Airport Road would be upgraded to include two HOV/Managed Lanes. In addition, bridge improvements would occur at Carmel Valley Creek, and San Dieguito and Batiquitos lagoons as well as culvert replacement at Sorrento Valley Road
- Community enhancements including bike/pedestrian path connections at Old Sorrento Valley Road, Carmel Valley, Hall Property Park, Santa Fe Drive to Encinitas Boulevard (including Requeza Street), Cottonwood Creek Park to Union Street; bike/pedestrian paths adjacent to San Dieguito, and Batiquitos Lagoons; Solana Hills Drive trailhead;

Union Street pedestrian overpass; Carmel Valley Road, Birmingham Drive, and La Costa Avenue park and rides; Ida Avenue streetscape enhancements; and NC Bikeway in the Cities of San Diego and Solana Beach

By Year 2035:

- The I-5 segment from Palomar Airport Road to SR-78 would be upgraded from two to four HOV/Managed Lanes, and I-5 from SR-78 to Vandegrift Boulevard (which currently does not have HOV lanes) would be upgraded to include the four HOV/Managed Lanes. Braided ramps would be constructed for the I-5 segment from Genesee Avenue to Sorrento Valley Road. Bridge improvements would be completed at Agua Hedionda and Buena Vista lagoons as well as the San Luis Rey River
- Community enhancements including bike/pedestrian path and bridge enhancements at Agua Hedionda Lagoon; bike/pedestrian path and undercrossing enhancements north of the San Luis Rey River; bike/pedestrian overpass improvements at Division Street and Mission Avenue; bike/pedestrian improvements at Bush Street and Harbor Drive/Camp Pendleton; SR-76 parking/staging area; Oceanside Boulevard streetscape enhancements; California Street pocket park and pedestrian improvements; community open space and/or community gardens at North Horne Street; community gardens at Bush Street; and regional gateway feature at Harbor Drive

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Table 2.2.2
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
SAN DIEGO				
1 – Los Peñasquitos Creek Trail Connection	Proposed extension of Los Peñasquitos Creek Trail to the west, under I-5 / I-805 to Sorrento Valley Road. Trail would continue along the south bank of Peñasquitos Creek, cross Vista Sorrento Parkway east of I-5 / I-805, and connect with Vista Sorrento Parkway and Sorrento Valley Train Station west of I-5 / I-805 (*1007 feet long, 8 feet wide*)	***Land Use:*** • No land acquisition required • Implements components of City of San Diego Bicycle Master Plan and the SANDAG San Diego Regional Bicycle Plan • Improves access for humans and wildlife to Los Peñasquitos Canyon Preserve to the east; and Los Peñasquitos Lagoon, Torrey Pines Reserve, and the coast to the west ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides access to existing bicycle paths along east and west sides of I-5 in this area • Provides a separate path for pedestrians and bicyclists to the train station • Provides safer routes to transit and the Sorrento Valley Train Station ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • Impacts approximately 0.06 acre of State wetland at the top of the creek bank where riprap is currently located. The existing bench would be lowered to provide sufficient vertical clearance under the bridge. No impacts to sensitive species or ACOE wetlands	• Impacts avoided by using existing dirt bench, and existing benches of the southern abutments under I-5 / I-805 structures • Disturbed areas would be planted with native plant species • Fencing would be installed to prevent trail users from accessing wetland or sensitive habitat, and to prevent potential conflicts with wildlife • Signs would describe prohibitions regarding night use and pets on trails to prevent impacts to wildlife using the corridor • No night lighting would be provided in the underpass in order to avoid potential impacts to wildlife • Concurrent construction with I-5, minimizing potential community disruption	Impacts to 0.06 acre of Waters of the State would be mitigated at the San Dieguito W19 Mitigation site for no net loss
2a - Carmel Valley Bike/Pedestrian Trail Connection	Proposed trail connection on Old Sorrento Valley Road, linking Old Sorrento Valley Road to the existing SR-56 bike path. This trail connects three existing trail systems; the SR-56 Regional Bike Trail from the east, Sorrento Valley Road Trail from the south, and the Carmel Valley Road trail to the west to the coast (*1.23 miles long,12 feet wide*) *Additionally, this is also a segment of the proposed North Coast (NC) Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required. Construction activities would consist of installing signs and striping for the bike path as a Class 1 facility, and construction of a non-motorized undercrossing at I-5 to link Old Sorrento Valley Rd. with the SR-56 bike path, closing an existing gap in the regional bicycle network. Implements components of the City of San Diego Bicycle Master Plan and the SANDAG San Diego Regional Bicycle Plan • Implements last section of 110-mile long Sea to Sea Trail • Improves access to the coast and Torrey Pines State Park ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Improves regional and local connectivity by providing access to existing paths/trails along east and west sides of I-5 in this area ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts	• Impacts avoided by using existing bench under I-5 adjacent to the creek • Disturbed areas would be planted with native plant species • Removal of accumulated sediment under the bridge would enhance Los Peñasquitos Lagoon flows • Fencing would be installed to prevent trail users from accessing wetland or sensitive habitat, and to prevent potential conflicts with wildlife • Signs would describe prohibitions regarding night use and pets on trails to prevent impacts to wildlife using the corridor • No night lighting would be provided in the underpass in order to avoid potential impacts to wildlife • Concurrent construction with I-5, minimizing potential community disruption	None required
2b - Enhanced Park and Ride at Carmel Valley Road	Proposed enhancements to existing park and ride lot; including additional parking, trailhead facilities, and pedestrian amenities (3.16 acres)	***Land Use:*** • No land acquisition required • Consistent with existing land use, the City of San Diego Bicycle Master Plan, the SANDAG San Diego Regional Bicycle Plan, and Caltrans standards for park and ride facilities ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Improves access to multiple trail systems along Los Peñasquitos Lagoon, Sorrento Valley Road, Carmel Valley Road, and the coast • Provides additional parking and access for Torrey Pines State Reserve and the beach • Supports ridesharing and non-motorized access choice	• Impacts avoided by reconfiguring and restoring existing park and ride lot • Fencing would be reinstalled to prevent intrusion into wetlands/sensitive habitat and prevent potential conflicts with wildlife • Concurrent construction with I-5, minimizing potential community disruption • Native plant species are proposed to create a visual buffer between the trail and the parking area. No invasive species would be used	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
SAN DIEGO (cont.)				
2b (cont.)		***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Visual/Aesthetics:*** • Landscaping with native shrubs and trees • Trailhead with scenic overlook of Los Peñasquitos Lagoon • Interpretive exhibits ***Biological Resources:*** • No impacts		
2c - Old Sorrento Valley Road Bicycle/Pedestrian Enhanced Trail Connections from Carmel Valley Road to Carmel Mountain Road	Proposed enhancements to existing Class 1 bicycle trail on old Sorrento Valley Road west of I-5. Proposed enhancements include the replacement of the existing culverts with a 443-foot long bridge, interpretive overlooks, and trail information stations (*1.1 miles long, 12 feet wide*) *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans right-of-way ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Enhances non-motorized community connections and provides increased commute options • Provides safer routes to transit and the Sorrento Valley Train Station ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Hydrology/Drainage/Floodplains:*** • Replacement of culverts with 443-foot-long bridge would improve lagoon flows ***Biological Resources:*** • Fill removal from the old road and culverts would create 0.44 acre of wetland habitat	• Concurrent construction with I-5, minimizing potential community disruption	None required
3 - Bicycle/ Pedestrian Enhanced Trail and Bridge on west side of I-5 at San Dieguito Lagoon	Proposed Class I bike path connecting Del Mar Heights Road to Via de la Valle (*2.25 miles long, 12 feet wide*) *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Enhances non-motorized community connections and provides increased commute options • Provides safer routes to transit ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts	• Concurrent construction with I-5, minimizing potential community disruption • Impacts minimized by designing the bridge structure to accommodate a bike path, and by placing retaining walls on existing slopes to allow for a bike path within the I-5 right-of-way • Signs would describe prohibitions regarding night use and pets on trails to prevent impacts to wildlife using the corridor	None required
4 – Pedestrian Overpass Connection north of Del Mar Heights Road	Proposed pedestrian overpass located north of existing Del Mar Heights Road. The overpass would connect Lower Ridge Road on the east through an existing maintenance easement to the proposed NC Bikeway on the west. *(616.80 feet long, 12 feet wide)*	***Land Use:*** • No land acquisition required ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Enhances non-motorized community connections and provides increased commute options • Provides safer routes to transit ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts	• Concurrent construction with I-5, minimizing potential community disruption • Utilization of existing maintenance easement	None required
5 - NC Bikeway in the City of San Diego	See information about Regional Enhancements on *Table 2.2.3*			

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
		SOLANA BEACH		
1 - Streetscape Enhancements on Ida Avenue	Proposed streetscape enhancements along Ida Avenue, from Academy Drive to south of Genevieve Street. Improvements include sidewalks, curbs, and landscaping (*1.08 acres, 0.32 mile on Ida Avenue*)	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans right-of-way and local city street • Consistent with existing land use and with the Eden Gardens Streetscape Master Plan and the Solana Beach General Plan ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Promotes pedestrian access through the neighborhood ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Visual/Aesthetics:*** • Addition of landscaping would provide visual mitigation for the adjacent freeway project ***Biological Resources:*** • No impacts to sensitive habitats or species	• The I-5 project proposes a retaining wall along this section of the existing freeway that would provide extra area for streetscape improvements. These would minimize project visual impacts • Plantings would be compatible with local plans. No invasive species would be planted • Concurrent construction with I-5, minimizing potential community disruption	None required
2 - Pedestrian Trailhead at Solana Hills Drive	Proposed provision of parking and drop off, interpretive displays and trailhead facilities, and trail connection between the north end of Solana Hills Drive trails and San Elijo Lagoon Ecological Reserve (*0.5 acre*) *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required ***Community:*** • Improves access to and enhances opportunity for public use and enjoyment of the lagoon trails • Promotes public education on natural systems and lagoon environment • Creates an enhanced pedestrian connection from the residential communities in north Solana Beach to the existing trail systems at San Elijo Lagoon Ecological Reserve ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Promotes pedestrian access to San Elijo Lagoon ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions • Emissions generated from construction activities outside the transportation project's impact footprint would be *de minimis* ***Biological Resources:*** • Impacts 0.03 acre of disturbed coastal sage scrub	• Modify existing street to accommodate sidewalks, curb, and parallel parking to minimize potential impacts and remain in existing City and Caltrans right-of-way • Use of an existing trail head minimizes impacts to sensitive habitat over construction at a new location • Plantings would be compatible with the native adjacent ecological reserve • No invasive species would be planted • Security lighting would be provided at the City street, which would have shielding and be directed away from sensitive habitat • Concurrent construction with I-5, minimizing potential community disruption	Impacts to 0.03 acre of disturbed coastal sage scrub would be mitigated with no net loss restoration mitigation at San Elijo Uplands
3 - NC Bikeway in the City of Solana Beach	See information about Regional Enhancements on *Table 2.2.3*			

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
		ENCINITAS		
1 - Bicycle/ Pedestrian Enhanced Trail on both sides of I-5 at San Elijo Lagoon with Bridge connection to Manchester Avenue	Proposed trail along west side of I-5 between trailhead at Solana Hills Drive, crossing over San Elijo Lagoon to Manchester Avenue (*1 mile long, 12 feet wide*) This includes sidewalk improvements on the south side of Manchester Avenue under I-5, with a trail connection to new and existing trails on the east and west sides of the southern I-5 bridge abutment with a bicycle/pedestrian suspension bridge attached to and under I-5 at the lagoon *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • A small triangle of land would be acquired (0.21 acre at toe of west I-5 slope, at the south side of San Elijo Lagoon) • Implements components of the Trails Element of the City of Encinitas General Plan and consistent with the SANDAG San Diego Regional Bicycle Plan ***Community:*** • Provides connectivity to trail system currently severed by the lagoon and freeway • Connects the Cities of Solana Beach and Encinitas • Provides enhanced access for communities to coastal areas and lagoon ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Improves regional and local connectivity by providing access to existing paths/trails east and west of I-5 • Provides non-motorized access choice that crosses the lagoon and connects communities ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No direct impacts to sensitive habitats or species	• Construction of a bicycle/pedestrian bridge suspended from I-5 would minimize impacts to the lagoon construction compared to a ground-level path • Simultaneous construction would avoid additional temporary impacts associated with a separate construction event • A retaining wall would be constructed to support development of a 12-foot-wide paved trail to avoid impacts outside Caltrans right-of-way along the south side of the lagoon • Pedestrian fencing would be provided to prevent trail users from accessing sensitive habitat • Trail lighting would be provided along Manchester Avenue and on the suspended bridge if compatible with sensitive resources, and would have shielding and be directed away from sensitive habitat	None required
2a - Park and Ride Enhancements at Birmingham Drive	Proposed improvements to existing park and ride lot east of I-5 at Birmingham Drive. Includes construction of a roundabout at the south end of the lot, realignment of northbound on-ramp, reconfiguration of the lot, and allowing the provision of 32 parking spaces, with sidewalks, a new trail head for the proposed trail along Villa Cardiff Drive, and landscaping (*0.48 acre*)	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans or local agency right-of-way • Increase in paved parking area (0.48 acre) • Consistent with Trails Element of Encinitas General Plan ***Community:*** • Provides enhanced connectivity to Encinitas trail system • Provides enhanced access for communities to coastal areas and communities • System connects neighborhoods and parks east and west of I-5 ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Addition of parking spaces (to a total of 32) and sidewalks within existing park and ride lot • Supports ridesharing and non-motorized access choice ***Visual/Aesthetics:*** • New landscaping would improve visual character ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions • Included in project-level and regional *I-5 NCC Project* air quality modeling ***Biological Resources:*** • No impacts to sensitive habitats or species	• Landscaping plant palette would be compatible with local plans. No invasive species would be used • Concurrent construction with I-5, minimizing potential community disruption	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
ENCINITAS (cont.)				
2b - Villa Cardiff Drive Improvements and Mackinnon Bridge Enhancements	Proposed landscaping, sidewalk/trail connections from Villa Cardiff east of I-5 and from Hall Park west of I-5 across new MacKinnon Bridge (*0.6 mile long, 12 feet wide*) *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans and local agency right-of-way • Implements components of Trails Element of Encinitas General Plan ***Community:*** • Provision of bicycle/pedestrian access between neighborhoods/parks east and west of I-5 would improve neighborhood cohesion ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Improves trail connectivity between Birmingham Drive, Villa Cardiff Drive, MacKinnon Avenue Bridge, and Hall Park • Provides non-motorized access choice ***Visual/Aesthetics:*** • Improves visual character between neighborhoods east and west of I-5 ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts to sensitive species or habitats	• Concurrent construction with I-5, minimizing potential community disruption • Landscaping plant palette would be compatible with local plans and include native plant species. No invasive species would be used	None required
3 - Hall Park Trail Connecting to Santa Fe Drive	Proposed trail connection between Hall Property Park and Santa Fe Drive, west of I-5. Located between the proposed freeway on-ramp and parking facilities of existing commercial lot to the west (*0.66 mile long*)	***Land Use:*** • No land acquisition required. Access easement is through a parking lot ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides new direct access for pedestrians and bicyclists into Hall Property Park • Provides non-motorized access choice ***Community:*** • Improves neighborhood connectivity • Consistent with the City's vision for improvement in this area ***Visual/Aesthetics:*** • Improved visual character through landscape plantings ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption • Native landscaping plant palette. No invasive species would be used	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
ENCINITAS (cont.)				
4 - Trail Connecting Santa Fe Drive to Requeza Street with Wetland Revegetation	Proposed north/south trail connection on the east side of I-5 between Santa Fe Drive and Requeza Street. Includes drainage improvements and wetland vegetation restoration (*0.45 mile long, 12 feet wide*) *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • Small portion of acquisition in open slope area (0.47 acre) ***Community:*** • Improves neighborhood connectivity • Consistent with the City's vision for improvement in these neighborhoods ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides bicycle/pedestrian connection between Santa Fe Drive and Requeza Street • Provides access to Hall Property Park for residents north of Santa Fe Drive and east of I-5 • Provides non-motorized access choice ***Visual/Aesthetics:*** • Improves visual character and quality of the area. Connection would provide a park-like native landscape ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions • Construction emissions generated from construction activities outside the transportation project's construction footprint would be *de minimis* ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption • Revegetation of disturbed areas with native plant species. No invasive species would be used • A bridge is proposed to span across the wetland and avoid impacts	None required
5 - Trail Connecting Requeza Street to Encinitas Boulevard	Proposed trail along the east side of I-5 between Requeza Street and Encinitas Boulevard, between the freeway and existing commercial businesses to the east. Includes invasive species removal and revegetation (*0.78 mile long, 12 feet wide*) *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • Partial parcel take in slope area (0.11 acre) ***Community:*** • Improves neighborhood connectivity • Consistent with the City's vision for improvement in these neighborhoods ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides connectivity with existing unimproved trail that leads to Requeza Street ***Visual/Aesthetics:*** • Landscaping to include native shade trees and ground cover along trail, resulting in improved visual character and quality • Provides neighborhood connection to Hall Property Park with a park-like native landscape ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions • Emissions generated from construction activities outside the transportation project's impact footprint would be *de minimis* ***Biological Resources:*** • Impacts from fill to 0.02 acre of degraded non-wetland Waters of U.S. and 0.09 acre of impact to degraded Waters of State • Removal of perennial invasive species within the remaining existing degraded wetland • Wetland revegetation with natives	• Concurrent construction with I-5, minimizing potential community disruption • Impacts to the existing wetlands minimized by design • Invasive plant species removal throughout entire drainage and revegetation with native wetland species	Impacts to wetland habitats would be mitigated for no net loss at the San Dieguito W19 Mitigation Site

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
		ENCINITAS (cont.)		
6a - Union Street Pedestrian Overpass	Proposed pedestrian overpass bridge across I-5, including enhanced landscaping (*1092 feet long, 12 feet wide*) *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans or local agency right-of-way • City of Encinitas Council approval required ***Community:*** • Provides access to/from neighborhoods and parks east and west of I-5 • Provides access to coastal recreation ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides connectivity between the neighborhoods east and west of I-5 • Provides non-motorized access choice ***Visual/Aesthetics:*** • Improves visual character, quality, and cohesion for area neighborhoods ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts	• Concurrent construction with I-5, minimizing potential community disruption • Bridge designed to avoid adjacent wetlands	None required
6b - Cottonwood Creek Park to Union Street Trail Connection with Wetland Revegetation	Proposed trail on west side of I-5 from Encinitas Boulevard to Union Street, with connection to Cottonwood Creek Park. Includes wetland revegetation (*0.25 mile long, 8 feet wide*)	***Land Use:*** • Partial parcel take in slope area (0.16 acre) • Construction easements required for two parcels on Union Street • Implements component of Trails Element of Encinitas General Plan ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides trail connectivity • Provide non-motorized access choice ***Community:*** • Improves neighborhood connectivity • Consistent with the City's vision for improvement in these neighborhoods • Connects Cottonwood Creek Park with City open space on Union Street ***Visual/Aesthetics:*** • Improved visual character, quality, and cohesion ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions • Construction emissions generated from construction activities outside the transportation project's construction footprint would be *de minimis* ***Biological Resources:*** • Opportunities for wetland restoration to adjacent wetlands	• Concurrent construction with I-5, minimizing potential community disruption	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
ENCINITAS (cont.)				
7 - NC Bikeway in the City of Encinitas	See information about Regional Enhancements on *Table 2.2.3*			
CARLSBAD				
1a – Bicycle/ Pedestrian Enhanced Trail on west side of I-5 at Batiquitos Lagoon	Proposed trail along the west side of I-5 between La Costa Avenue, crossing over Batiquitos Lagoon to Avenida Encinitas. Also, a bridge crossing is proposed under I-5 to lagoon trails on the west side, and connecting north and south sides of the lagoon (*1.18 miles long, 12 feet wide*) *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required ***Community:*** • Provides connectivity to trail system currently severed by the lagoon and freeway • Provides enhanced access for communities to coastal areas and lagoon ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides non-motorized access choice that crosses the lagoon and connects communities ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No sensitive habitat and species impacts	• Concurrent construction with I-5, minimizing potential community disruption • A boardwalk and bridge would replace an existing illegal trail across the salt flat and unpermitted bridge over the wetland, thus minimizing impacts associated with uncontrolled use • A short retaining wall would be constructed within I-5 slopes to eliminate increase in fill otherwise required for trail construction • Any lighting would have shielding and be directed away from sensitive habitat • Signage would identify this area as sensitive habitat and include restrictions • Fencing would be of a type to keep people on the paths, while allowing wildlife crossings	None required
1b - Park and Ride Enhancement at La Costa Avenue	Proposed reconfiguration of existing park and ride lot and enhanced landscaping. Includes improvements to maintenance road accessing least tern area (*3.56 acres, 189 parking spaces*)	***Land Use:*** • No land acquisition required ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Promotes ridesharing through additional parking spaces for existing high use park and ride ***Air Quality:*** • Promotes use of ridesharing, potentially reducing air emissions ***Biological Resources:*** • No impacts to sensitive habitats or species • Provides improved driveway access to least tern nesting site road; facilitating dredging operations, and monitoring and maintenance of the nesting area	• Concurrent construction with I-5, minimizing potential community disruption • Reconfigures the existing area to provide more parking spaces and minimize park and ride expansion • Native landscaping plant palette. No invasive species would be used • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds • Signage would identify this area as sensitive habitat and include restrictions • Fencing would be of a type to keep people on the paths, while allowing wildlife crossings	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
CARLSBAD (cont.)				
3 – Bicycle/ Pedestrian Enhanced Trail on east side of I-5 at Agua Hedionda Lagoon	Proposed trail segment along the east-side of I-5 between Cannon Road, crossing over Agua Hedionda Lagoon, to Chinquapin Avenue. This includes a new pedestrian bridge and trail crossing from east to west along the southern shore of the lagoon, underneath I-5 *(1.13 miles long, 12 feet wide)* *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required ***Community:*** • Provides connectivity to trail system currently severed by the lagoon and freeway • Connects the Cities of Solana Beach and Encinitas • Provides enhanced access for communities to coastal areas and lagoon ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides non-motorized access choice that crosses the lagoon and connects communities ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No sensitive habitat would be impacted	• Concurrent construction with I-5, minimizing potential community disruption • Retaining wall restricts impact footprint	None required
4 - NC Bikeway in the City of Carlsbad	See information about Regional Enhancements on *Table 2.2.3*			
OCEANSIDE				
1 - Pocket Park and Pedestrian Path at California Street	Proposed pocket park and pedestrian path at California Street east of I-5. Includes landscaping, lighting, and enhancing the existing California Street Overcrossing *(0.26 acre)*	***Land Use:*** • No land acquisition required. Parcels used to create pocket park are remnant from freeway acquisitions ***Community:*** • Implements "safe walk to school" principles • Provides residents separate pedestrian route along California Street • Creates community pocket park ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Implements "safe walk to school" principles • Provides residents separate pedestrian route along California Street ***Visual/Aesthetics:*** • Improves visual character and quality through park creation and landscaping • Provides visual enhancements on the California Street overcrossing ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption • Pocket parks would be created from remnant parcels acquired for freeway construction	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
OCEANSIDE (cont.)				
2 - Oceanside Boulevard Streetscape Enhancement	Proposed widening of existing sidewalk and addition of landscape on Oceanside Boulevard under and adjacent to I-5. Includes enhanced fencing along the Sprinter tracks (*0.70 acre*)	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans right-of-way ***Community:*** • Provides connection to existing Ron Ortega Recreation Park ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides greater pedestrian separation (with fencing and landscaping) from the Sprinter routes along Oceanside Boulevard ***Visual/Aesthetics:*** • Improves visual character of Oceanside Boulevard by continuing landscaping proposed to the east ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption	None required
3 - Division Street Bicycle/Pedestrian Enhancements	Proposed widening of existing Division Street pedestrian overcrossing; provision of container planting, street trees, and pavement design (*0.66 acre*)	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans or local agency right-of-way ***Visual/Aesthetics:*** • Proposed enhancements would contribute to improved visual character, quality, and cohesion ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption	None required
4 - Mission Avenue Bicycle/Pedestrian Enhancements	Proposed widening of sidewalks on Mission Avenue overcrossing, realignment, pedestrian crossing signals, addition of landscaping (*0.77 acre, sidewalks 0.76 mile long*)	***Land Use:*** • No land acquisition required ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Realignment of pedestrian signals eliminates conflict at freeway ramps • Supports non-motorized access choice • Improves safety for Oceanside High School students who bike and walk to school ***Visual/Aesthetics:*** • Improves visual character, quality, and cohesion ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
OCEANSIDE (cont.)				
5 - Bush Street Bicycle/Pedestrian Enhancements and Community Gardens	Proposed widening of existing sidewalks and addition of landscaping to overcrossing (*1.17 acre*, *sidewalks 0.48 mile long*)	***Land Use:*** • No land acquisition required. Construction activities would occur within existing local agency right-of-way • Implements Trails Element of the Oceanside General Plan ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides increased trail connectivity ***Community:*** • Improves neighborhood connectivity • Consistent with the City's vision for improvement in these neighborhoods ***Visual/Aesthetics:*** • Enhancements would contribute to improved visual character ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption	None required
6 - Community Open Space Park and Gardens	Proposed community open space park and/or community gardens adjacent to Family Recovery Center on Horne Street *(0.285 acre)*	***Land Use:*** • No land acquisition required. Remnant parcels acquired for freeway construction would be utilized ***Community:*** • Improves neighborhood connectivity • Consistent with the City's vision for improvement in these neighborhoods ***Visual/Aesthetics:*** • Enhancements would contribute to improved visual character ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • No impacts	• Concurrent construction with I-5, minimizing potential community disruption • Remnant parcels acquired for freeway construction would be utilized	None required
7 - SR-76 Underpass New Parking and Trailhead	Proposed parking area, trailhead staging area, and other support amenities for the existing San Luis Rey bike path located on east side of I-5 / SR-76 interchange. Includes southern willow scrub and coastal sage scrub restoration *(0.84 acre, 51 parking spaces)*	***Land Use:*** • No land acquisition required ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides parking for ridesharing • Provides trail connectivity ***Visual/Aesthetics:*** • Improved visual character and quality ***Air Quality:*** • Promotes ridesharing and use of non-motorized transportation, potentially reducing air emissions	• Concurrent construction with I-5, minimizing potential community disruption • Creation/restoration of the ornamental/disturbed habitat between the San Luis Rey River and the trail/park and ride would additionally minimize impacts from trail use • Native landscaping plant palette. No invasive species would be used • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds • Signage would identify this area as sensitive habitat and include restrictions	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
OCEANSIDE (cont.)				
7 (cont.)		***Biological Resources:*** • No direct impacts to sensitive habitats or species • Fencing reduces indirect impacts from trail users to surrounding habitat • Creation/restoration of additional native habitat between the trail and the river would provide additional buffer • Demolition of abandoned freeway ramp provides opportunities for southern willow scrub and coastal sage scrub restoration		
8 – Pedestrian Underpass Improvements north of San Luis Rey River	Proposed enhancements to existing underpass at San Luis Rey Drive; including widening sidewalk, ramp connections to meet ADA requirements, improved lighting and planting and public art features *(0.10 mile long)*	***Land Use:*** • No land acquisition required ***Community:*** • Improves neighborhood connectivity ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides ADA compliant access • Provides enhanced coastal access • Provides modal access choice ***Visual/Aesthetics:*** • Improved visual character, quality, and cohesion with addition of landscaping and public art features ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions ***Biological Resources:*** • Trail on the northern abutment of the San Luis Rey River bridge is proposed mid-slope in a disturbed/bare dirt area. No impacts to sensitive habitats or species are anticipated	• Concurrent construction with I-5, minimizing potential community disruption • Trail on northern side of river was proposed to extend to base of slope. Trail redesigned to be constructed mid-slope on the abutment to avoid impacts to habitat near the river and to keep pedestrians further from sensitive habitats and species	None required
9 - Regional Gateway Feature at Harbor Drive	Proposed regional gateway art feature at Harbor Drive (*0.28 acre*)	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans or local agency right-of-way ***Community:*** • Creates a regional gateway at this location, signaling entry into the San Diego region • Provides a focal point for regional and community identification ***Visual/Aesthetics:*** • Improves visual character and quality ***Air Quality:*** • Construction emissions generated from construction activities outside the transportation project's construction footprint would be *de minimis* ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption	None required

Table 2.2.2 (cont.)
COMMUNITY ENHANCEMENTS INFORMATION

FEATURE	DESCRIPTION/ LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
OCEANSIDE (cont.)				
10 - Harbor Drive/Camp Pendleton Pedestrian and Bicycle Enhancements	Proposed enhancements at Harbor Drive/Camp Pendleton. Includes tunnel to avoid I-5 NB off-ramps for pedestrians, bicyclists and residents of the Capistrano neighborhood in Oceanside *(0.35 mile long, 12 feet wide)* *Additionally, this is also a segment of the proposed NC Bikeway. See Table 2.2.3 – Regional Enhancements*	***Land Use:*** • No land acquisition required. Construction activities would occur within existing Caltrans and local agency right-of-way ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides ADA compliant access • Provides enhanced coastal access • Provides modal access choice • Improves neighborhood connection ***Visual/Aesthetics:*** • Improved visual character and quality ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions • Emissions generated from construction activities outside the transportation project's impact footprint would be *de minimis* ***Biological Resources:*** • No impacts to sensitive habitats or species	• Concurrent construction with I-5, minimizing potential community disruption	None required
11 - NC Bikeway in the City of Oceanside	See information about Regional Enhancements on *Table 2.2.3*			

Table 2.2.3
REGIONAL ENHANCEMENTS INFORMATION

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
NORTH COAST BIKEWAY GENERAL INFORMATION			
The North Coast Bikeway (NC Bikeway) is proposed to extend from Gilman Drive the City of San Diego, to Harbor Dr. in the City of Oceanside (*27 miles*). To facilitate the NC Bikeway, the *I-5 NCC Project* would include new bikeway facilities within sections of the proposed freeway footprint. These sections would fill in gaps between existing trails in the cities along I-5, and connect to other regional and inter-regional bicycle facilities. Bikeway crossings would be constructed with the I-5 bridges over San Dieguito, San Elijo, Batiquitos, and Agua Hedionda Lagoons, Several non-motorized freeway crossings and local bikeway connections are proposed to provide safer routes to transit than are currently available. These are proposed at Voigt Drive, along Roselle Street, Sorrento Valley Road to Peñasquitos Creek Trail, under I-5 south of the I-5 / SR-56 Interchange, under I-5 at San Dieguito River bridge, under I-5 at San Elijo bridge, at an overcrossing at Union Street, and under Harbor Drive. *Figures 2-2.4a* through *2.2.4j* depict the proposed route. Descriptions of the NC Bikeway are provided by city, below.	***Land Use:*** • No land acquisition required. Construction activities would be within existing Caltrans right-of-way • Consistent with local land use planning, regional pedestrian and bicycle plans ***Community:*** • Non-motorized community connections and increased commute options, as well as providing safe routes to transit • Would improve access to community, lagoon, and coastal resources ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Facilitates existing and planned pedestrian and bicycle transportation along the full length of the 27-mile *I-5 NCC Project* ***Air Quality:*** • Promotes non-motorized transportation, potentially reducing air emissions • Outside the proposed I-5 footprint, the path would utilize existing bicycle routes that require no construction activity	• Uses existing regional bicycle routes to be consistent with existing local and regional planning • Proposed segments would be built during I-5 construction to minimize potential impacts associated with multiple construction events • Use of retaining walls on existing I-5 slopes allow for a Class 1 bike facility within proposed I-5 right-of-way, thereby minimizing impacts • Caltrans is continuing to work with the public, cities, and resource agencies to identify local street segments to incorporate into long range non-motorized transportation planning	None required for most segments. Exceptions discussed below for San Diego and Solana Beach
NC Bikeway in SAN DIEGO			
The first section of the bikeway is in the City of San Diego, beginning at Gilman Drive and ending at Via de la Valle just south of the City of Solana Beach (*8.60 miles)* The beginning of the bikeway is a Class II Bikeway from Gilman Dr to the Voigt Dr Bridge. From there it turns to a Class I bike path continuing to Roselle Street in Sorrento Valley. At Roselle Street, the bikeway travels on local streets east crossing the railway, and turns north along Sorrento Valley Road to the intersection with Carmel Mountain Road. At this intersection the route turns back into a Class 1 bike path on a separate path that eventually intersects an existing park and ride lot and Carmel Valley Road. This segment of the path is known as part of The Coastal Rail Trail, another proposed regional bicycle corridor. At Carmel Valley Road the path heads west on local streets, and then north onto Portofino Drive, and to Del Mar Heights Road. The route turns into a Class 1 facility along I-5, crossing the San Dieguito Lagoon to Via De La Valle.	See description under General Information, above, for more information about benefits and impacts associated with the project ***Land Use and Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Using the freeway footprint to include non-motorized connections over the lagoon would serve residents, commuters, and visitors who currently lack a non-motorized option to cross the lagoon ***Hydrology/Drainage/Floodplains:*** • Prior to NC Bikeway inclusion, this area was identified as temporarily impacted by I-5 improvement construction and drainage was to be piped to either side of the fill. All drainage would now be piped to the outlet by the San Dieguito River ***Biological Resources:*** • Between the San Dieguito River Bridge and Via de la Valle, 0.5 acre of coastal brackish marsh would be impacted due to additional fill needed for the bike path (0.36 acre ACOE wetland impact, 0.50 acre State wetland impact)	See description under General Information, above, for more information about avoidance and minimization strategies • Use of a retaining wall to keep bike path support slope within existing I-5 slopes eliminated impacts to sensitive species and habitats for all but the identified impact area	Impacts to wetland habitats would be mitigated for no net loss at the San Dieguito W19 Mitigation Site and through other enhancements identified in the REP

Table 2.2.3 (cont.)
REGIONAL ENHANCEMENTS INFORMATION

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
NC Bikeway in SOLANA BEACH			
The NC Bikeway would provide enhancements to current bicycle facilities and create new community connections that currently do not exist. In the City of Solana Beach, the NC Bikeway would extend west on local streets, including: Via De La Valle, Valley Avenue, Stevens Avenue, and San Rodolfo Avenue. This would direct cyclists to the trailhead at Solana Hills Drive, where there would be a proposed bicycle/pedestrian enhanced trail crossing San Elijo Lagoon within the I-5 freeway footprint and connecting to Manchester Avenue (*2.39 miles*).	See description under General Information, above, for more information about benefits and impacts associated with the project ***Land Use:*** • Partial acquisition of 0.21 acre • Using the freeway footprint to include non-motorized connections over the lagoon would serve residents, commuters, and visitors who currently lack a non-motorized option to cross the lagoon ***Biological Resources:*** • 0.03 acre of disturbed coastal sage scrub would be impacted at the connection of the bikeway to Solana Hills Drive • No sensitive species would be impacted by this bikeway connection (as described on *Table 2.2.2*)	See description under General Information, above, for information about avoidance and minimization strategies	Mitigation would consist of restoration at San Elijo Uplands as described for Solana Beach 2 on *Table 2.2.2*
NC Bikeway in ENCINITAS			
The NC Bikeway would provide enhancements to current bicycle facilities and create new community connections that currently do not exist. In the City of Encinitas, the NC Bikeway would include the lagoon crossing between the northern boundary of Solana Beach and Manchester Avenue along I-5 as a Class 1 facility. The NC Bikeway would then utilize a combination of surface streets and freeway ROW through the communities of Cardiff, Encinitas, and Leucadia. Class I bike path connections would be from Regal Drive to Encinitas Blvd, along the bike/pedestrian bridge at Union Street, and from Orpheus Avenue to La Costa Avenue. At La Costa Avenue, the NC Bikeway would join with the proposed Class 1 facility in the I-5 footprint to cross Batiquitos Lagoon (*6.77 miles*)	See description under General Information, above, for information about benefits and impacts associated with the project	See description under General Information, above, for information about avoidance and minimization strategies	None required
NC Bikeway in CARLSBAD			
The NC Bikeway would provide enhancements to current bicycle facilities and create new community connections that currently do not exist. In the City of Carlsbad, the NC Bikeway would include a Class I bike path crossing of Batiquitos Lagoon and connecting to Avenida Encinas. From there the bike path would utilize surface streets and segments of the Coastal Rail Trail until it reaches a second lagoon crossing at Agua Hedionda, which would be a Class I path within the I-5 footprint. Improvement north of the NC Bikeway interface with Avenida Encinas is likely to augment/contribute to the completion of the Coastal Rail Trail in the City (*7.33 miles*).	See description under General Information, above, for information about benefits and impacts associated with the project	See description under General Information, above, for information about avoidance and minimization strategies	None required
NC Bikeway in OCEANSIDE			
The NC Bikeway would provide enhancements to current bicycle facilities and create new community connections that currently do not exist. The NC Bikeway would be likely to augment/contribute to the completion of the Coastal Rail Trail, while possibly including a connection to the Inland Rail Trail and the San Luis Rey River Trail (*4.36 miles*).	See description under General Information, above, for information about benefits and impacts associated with the project	See description under General Information, above, for information about avoidance and minimization strategies	None required

Table 2.2.4
COMMON PROJECT DESIGN FEATURES—DIRECT ACCESS RAMPS

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
VOIGT DRIVE DAR			
The **Voigt Drive DAR** provides direct access to high density medical, university, and business centers near University of California San Diego (UCSD). As such, there is a high potential for multimodal connectivity (e.g., Mid-Coast Corridor Light Rail Transit [LRT] Project). This is projected to be a high usage facility with forecasted ADT of 14,900 vehicles by 2030. Two DAR structure options were evaluated and the slimmer design was chosen. Cars would enter and exit the HOV/Managed Lanes from the lane closest to the median. Advantages of DAR to and from Voigt Drive: • Logical termini to HOV/Managed Lanes • High HOV/Managed Lane target destination east and west of I-5 • Access to hospitals and medical facilities (e.g., UCSD, Scripps) • Access to Veterans Administration (VA) Hospital • Access to employment centers east of I-5 (Qualcomm, SAIC, etc.) • Reduces delay through I-5 / Genesee Avenue Interchange • Potential for multimodal connectivity • Coordinated with potential future Mid-Coast Corridor LRT Project • Supports and facilitates future Bus Rapid Transit (BRT) along I-5 HOV/Managed Lanes	***Land Use:*** • Located north of La Jolla Village Drive and immediately south of Genesee Avenue along I-5 in the City of San Diego, within UCSD • Predominant land uses include urban, commercial businesses, industrial, office/retail, educational, residential, and open space • Scripps Memorial Hospital abuts the Voigt DAR to the north NB DAR: • Two parcels/properties would require partial acquisition (approximately 0.8 acre) • Total length of DAR (excludes length of DAR auxiliary lanes): ➢ NB DAR Off-ramp - 1640 feet ➢ NB DAR On-ramp - 2395 feet SB DAR: • Three parcels/properties would require partial acquisition (approximately 2.01 acres). Total length of DAR (excludes length of DAR auxiliary lanes): ➢ SB DAR Off-ramp- 2723 feet ➢ SB DAR On-ramp- 2264 feet ***Community and Visual/Aesthetics:*** • Improved coastal access and coastal views • Potential land availability • Proximity to employment/activity centers • Potential to serve local/regional transit services • Proximity to park and ride facilities • Proximity to underrepresented communities • Engineering feasibility • Local community support • Existing suburban campus character and compatible suburban parkway character of overcrossing area and freeway would change to one resembling an urban core area due to large structures that are proposed • Construction of DAR would permanently remove median oleanders • Proposed DAR viewshed would contrast with visual context of landscape unit, and is likely to be viewed as a negative change ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • DAR would facilitate access to the HOV/Managed Lanes • These locations would reduce traffic volumes at nearby interchanges, thus reducing delay (e.g., at I-5 / Genesee Avenue Interchange) • DAR ties directly into local road system • DAR provides access to the following: ➢ UCSD ➢ Hospitals and medical facilities (e.g., UCSD, Scripps, VA hospital) ➢ Employment centers east of I-5 (Qualcomm, SAIC) ➢ Shopping and hotels ➢ Coastal views ➢ Potential for multimodal connectivity (e.g., LRT)	***Air Quality:*** To minimize emissions of fugitive dust, PM_{10}, and $PM_{2.5}$ during construction, the project would comply with SDAPCD Rule 51: • Minimize land disturbance • Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to project work areas • Suspend grading and earth moving when wind gusts exceed 25 mph unless soil is wet enough to prevent dust plumes • Cover trucks when hauling dirt • Stabilize surface of dirt piles if not removed immediately • Limit vehicular paths on unpaved surfaces and stabilize any temporary roads • Minimize unnecessary vehicular and machinery activities • Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to roadway • Revegetate disturbed land, including vehicular paths created during construction, to avoid future off-road vehicular activities • Remove unused material Measures to minimize energy consumption and GHG emissions: • Construction phasing plan to identify sequence of construction and to help minimize traffic delays • Traffic delays controlled to the extent feasible during periods of many simultaneous construction operations • Comprehensive Traffic Management Plan (TMP) would further minimize delays during construction. TMP is designed to increase driver awareness, ease congestion, and minimize delay during construction. Components include: ➢ Public Awareness Program including changeable message signs, public service announcements via media, and 800 number	***Community and Visual / Aesthetics:*** • Pedestrian lighting, enhanced fencing and railings, and other urban amenities would be provided on each DAR local street overcrossing and be consistent with local values and goals • Existing streetscape elements and design themes would be continued within Caltrans right-of-way at each DAR overcrossing • Local streetscape guidelines would be followed • Container trees located on structures would be provided in locations where the responsible local agency has requested them and agreed to maintain them ***Air Quality:*** • Use low-emission on-site mobile construction equipment where feasible • Maintain equipment in tune per manufacturer's specifications • Retard diesel engine injection timing by two to four degrees unless not recommended by manufacturer (due to lower emission output in-place) • Use reformulated, low-emission diesel fuel • Substitute electric and gasoline-powered equipment for diesel-powered equipment where feasible • Use catalytic converters on gasoline-powered equipment • Do not leave inactive construction equipment idling for prolonged periods

Table 2.2.4 (cont.)
COMMON PROJECT DESIGN FEATURES—DIRECT ACCESS RAMPS

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
VOIGT DRIVE DAR (cont.)			
	Air Quality: • Project conforms to State Implementation Plan; no adverse regional air quality impact would occur as a result of project implementation • Project would not adversely impact existing air quality at representative sensitive receptors within project area • Project alternatives would not violate any state or federal CO standards • Regional transportation efficiency would be increased and overall CO_2 emissions would be reduced. Project reduction in congestion is estimated to reduce 2030 CO_2 emissions in San Diego region by up to 340 tons per day • Because proposed project would reduce delay at these locations, there is potential for further reduction in GHG emissions from vehicles spending less time idling ***Biological Resources:*** • No impact to sensitive species • Impact to 0.04 acre of disturbed coastal sage scrub and baccharis scrub • Impact to 0.06 acre of State wetland (disturbed southern willow scrub) and 0.01 acre of ACOE jurisdictional wetlands	➢ Traffic Operations Strategies Program includes ongoing evaluation of traffic operations and provides incident response during construction, CHP construction zone speed reduction enforcement, and alternate route strategies ***Biological Resources:*** • Wetland impacts would be reduced through structural design using a single, central column rather than double columns; using retaining walls on slopes; and steepening slopes to a 2:1 ratio	***Biological Resources:*** • Impacts to sensitive uplands and coastal California gnatcatcher would be mitigated for no net loss at the Deer Canyon II Upper Parcel • Impacts to wetlands would be mitigated for no net loss at the San Dieguito W19 Mitigation Site and through other enhancements identified in the REP
MANCHESTER AVENUE DAR (includes park and ride)			

The Draft EIR/EIS was based on the 2030 RTP, which identified BRT service along the southern section of the North Coast Corridor. (At the Manchester Avenue DAR, the BRT would exit I-5 and serve the El Camino Real corridor.) In the 2050 RTP, the region changed its BRT strategy to eliminate the El Camino Real service and replace it with 15 minute peak-period service to Carlsbad (originating from Mid City and Chula Vista).
 	
Even with changes to the BRT route, the location would provide access to coastal resources, Mira Costa College, town centers, and a major arterial paralleling the freeway. The Manchester DAR is also expected to have a high volume of traffic, with an ADT of approximately 6,400 vehicles by 2030. If the transit connection is put back in a future RTP, the Manchester DAR would be able to accommodate the demand and would be a logical location for future transit expansion.
	Land Use:
	• Located immediately northeast of the intersection of I-5 and Manchester Avenue in the City of Encinitas
	• Predominant land uses include disturbed habitat, a staging area, fallow agricultural land, and open space
	
	<u>Manchester Avenue DAR Off-ramp and On-ramp:</u>
	• 1608 feet
	• Two parcels/properties would require partial acquisition (approximately 3.98 acres)
	
	<u>NB DAR:</u>
	• Two parcels/properties would require partial property acquisition (approximately 1.09 acres) due to proposed freeway widening
	• Total Length of DAR (excludes length of DAR auxiliary lanes):
	  ➢ NB DAR off-ramp - 1000 feet
	  ➢ NB DAR on-ramp - 1837 feet
	
	<u>SB DAR:</u>
	• One parcel/property would require partial property acquisition (approximately 0.01 acre) due to proposed freeway widening
	• Total Length of DAR (excludes length of DAR auxiliary lanes):
	  ➢ SB DAR off-ramp - 1575 feet
	  ➢ SB DAR on-ramp - 1837 feet
		Farmland:
		• Caltrans would restore agriculture field around the park and ride to coastal sage scrub
		
		Community:
		• Caltrans has eliminated a DAR overcrossing and replaced it with an undercrossing (cut-and-cover tunnel) to minimize visual impacts
		
		Visual / Aesthetics:
		• In response to community and agency comments on the Draft EIR/EIS, the Manchester DAR has been redesigned from an overcrossing to an undercrossing, substantially minimizing visual effects
			Community:
			• Pedestrian lighting, enhanced fencing and railings and other urban amenities would be provided on each DAR local street overcrossing, consistent with local values and goals
			• Existing streetscape elements and design themes would be continued within Caltrans right-of-way at each DAR overcrossing
			• Local streetscape guidelines would be followed
			• Container trees located on structures would be provided in locations where the responsible local agency has requested them and agreed to maintain them

Table 2.2.4 (cont.)
COMMON PROJECT DESIGN FEATURES—DIRECT ACCESS RAMPS

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
MANCHESTER AVENUE DAR (cont.)			
The **Manchester Avenue DAR** would be located in an agricultural area adjacent to San Elijo Lagoon. Because of this, concerns were expressed during the public comment period regarding visual and coastal zone agricultural impacts related to the DAR design presented in the Draft EIR/EIS. The DAR structure was chosen because it has a slimmer requirement area than a more open structure. Cars would enter and exit the HOV/Managed Lanes from the lane closest to the median. Advantages of DAR to and from Manchester Avenue: • Access to proposed park and ride facility • Improved coastal access • Supports and facilitates future BRT along I-5 • HOV/Managed Lanes • Access to Mira Costa College (San Elijo Campus) • High HOV potential utilization on El Camino Real (serving eastern Encinitas)	***Land Use:*** Park and Ride: • Park and ride area (excludes bus facility) would be 21.67 acres • Due to irregular shape of park and ride, lengths and widths vary (approximate length varies from 252 feet to 518 feet; approximate width varies from 246 feet to 377 feet) • One parcel/property would require partial property acquisition (approximately 7.98 acres) ***Farmland:*** • DAR would directly affect greenhouse and nursery operations • Project would convert 18.5 acres of total 30.5-acre Prime Farmland currently being farmed to transportation uses. Encroachments would not preclude continuation of agricultural activities at nursery • 12 acres of this farmland could remain in agricultural production • Encroachments would not lead to shifts in existing land uses outside of these individual properties • Project improvements would affect a maximum of approximately 26 acres of Prime Farmland, Non-Prime Farmland, and Unique Farmland ***Community:*** • Improved coastal access and coastal views • A transit center (by others) with access road, parking for approximately 150 cars, and bus platform is proposed at Manchester DAR • DAR would permanently remove median oleanders • DAR would reduce weaving traffic • Change to visual quality and character, and viewer response is high; therefore, visual impact would be high ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • DAR would eliminate weaving across general-purpose lanes from traffic accessing HOV/ Managed Lanes • Location would reduce traffic volumes at nearby interchanges, thus reducing delay • DAR would tie directly into a local road system • DAR provides access to following: ➢ Proposed park and ride facility ➢ Future BRT line along I-5 to Carlsbad ➢ Mira Costa College (San Elijo Campus) ➢ Cardiff by the Sea and Solana Beach Town Centers ➢ El Camino Real, a highly used local road, serving east Encinitas ***Water Quality/Storm water Runoff:*** • Two potential sites have been identified for bioswales adjacent to this proposed DAR (one east of I-5 between the NB I-5 off-ramp exit and NB I-5 on-ramp entrance from Manchester Avenue; one west of I-5 between the SB I-5 off-ramp exit and SB I-5 on-ramp entrance from Manchester Avenue). Details to be determined in the design phase	***Air Quality:*** • Please refer to air quality avoidance/ minimization measures described for the Voigt DAR. These avoidance/minimization measures apply to all DARs ***Biological Resources:*** • Caltrans would restore coastal sage scrub around the park and ride lot that is currently an agriculture field • Caltrans has replaced a proposal for a DAR overcrossing and instead proposes an undercrossing to minimize biological impacts	***Air Quality:*** • Please refer to air quality mitigation measures described for the Voigt DAR. These mitigation measures apply to all DARs ***Biological Resources:*** • Impacts to sensitive uplands and coastal California gnatcatcher would be mitigated for no net loss at San Elijo Uplands and through other enhancements identified in the REP • Impacts to wetlands would be mitigated for no net loss at the San Dieguito W19 Mitigation Site and through other enhancements identified in the REP • Native landscaping plant palette. No invasive species would be used • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds • Landscape vegetation height would be appropriate for nearby sensitive species

Table 2.2.4 (cont.)
COMMON PROJECT DESIGN FEATURES—DIRECT ACCESS RAMPS

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
MANCHESTER AVENUE DAR (cont.)			
	Air Quality: • Please refer to air quality Impacts/benefits described for the Voigt DAR. These impacts/benefits apply to all DARs ***Biological Resources:*** • The DAR would have a lane configuration that tapers down but is approximately 16 feet wider at the ramp • North of the DAR, retaining walls would eliminate increased impacts to biological resources • South of the DAR, the wider freeway to accommodate the DAR would result in direct impact to 0.2 acre of coastal sage scrub (including disturbed) • 0.06/0.08 acre of ACOE waters of the U.S./State wetland from fill and 0.08 acre of additional wetlands would be shaded • Wider fill would impact portions of two to three territories of coastal California gnatcatcher • The 8+4 Buffer alternative would impact most of the remainder of the territories • Light-footed clapper rail occupy marsh adjacent to the fill • The park and ride is located in agricultural lands, developed and ornamental habitat, and would not directly impact any biological resources		

Table 2.2.5
COMMON PROJECT DESIGN FEATURES—BRAIDED RAMPS

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
Braided ramps improve traffic operations, reduce congestion, and enhance traffic safety within freeway-to-freeway interchanges. Under the No Build alternative, the Genesee Avenue intersections would operate at above-capacity conditions during the a.m. and p.m. peak periods. Traffic weaving occurs due to the short distance between the Genesee Avenue on-ramp and Roselle Street off-ramp (NB direction). The NB I-5 and Genesee to NB Bypass traffic volume is 3,230 vehicles per hour (veh/hr; p.m. peak). The SB Bypass to SB I-5 and Genesee is 4,023 veh/hr (a.m. peak). The addition of auxiliary lanes would not remedy congestion, but the braided ramps would avoid traffic weaving between Genesee Avenue and Roselle Street.	***Land Use:*** • Located on I-5 between Sorrento Valley Road/Roselle Street and Genesee Avenue within Sorrento Valley in the City of San Diego • Predominant land uses include urban, commercial businesses, industrial, office/retail, educational, and open space • UCSD is located immediately south of the proposed braided ramps • United States International University San Diego is located to the west • Scripps Memorial Hospital La Jolla is located immediately southeast of the intersection of I-5 and Genesee Avenue NB I-5 Braided Ramps: • Six parcels/properties would require partial acquisition (approximately 9.13 acres) • Total length of braided ramps - approximately 4718 feet SB I-5 Braided Ramps: • Six parcels/properties would require partial acquisition (approximately 12.42 acres) • Total length of braided ramps - approximately 4718 feet ***Community:*** • Improved pedestrian and bicycle crossings at Genesee Avenue would improve community connectivity ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Braided ramps reduce traffic weaving across auxiliary lanes • Genesee Avenue I-5 NB braided on-ramp modifications would improve pedestrian and bicycle crossings • Genesee Avenue SB I-5 off-ramp (braided ramp) would merge with a ramp from Roselle Street, allowing traffic from Sorrento Valley Road access to Genesee Avenue (a ramp bridge would braid this ramp over the proposed SB I-5 on-ramp from Roselle Street) ***Water Quality/Storm water Runoff:*** • Potential site for bioswales along NB off-ramp to treat storm water runoff ***Air Quality:*** • Project conforms to State Implementation Plan (SIP) and no adverse regional air quality impact would occur as a result of project implementation • Project would not adversely impact existing air quality at representative sensitive receptors within project area • Project alternatives would not violate any state or federal CO standards • Regional transportation efficiency would be increased and overall CO_2 emissions would be reduced. Project reduction in congestion is estimated to reduce 2030 CO_2 emissions in San Diego region by up to 340 tons per day ***Biological Resources:*** • Impacts would include: ➢ 5.57 acres of sensitive upland – primarily coastal sage scrub (including disturbed), coyote bush scrub (including disturbed), and less than 0.001 acre native grassland ➢ 1.52 acre of State wetlands and 0.71 acre ACOE Waters of the U.S. ➢ Wetland impacts include unvegetated stream channel, disturbed freshwater marsh, disturbed southern willow scrub, and disturbed coastal brackish marsh ➢ Direct impact to one pair of coastal California gnatcatcher	***Air Quality:*** To minimize emission of fugitive dust, PM_{10}, and $PM_{2.5}$ during construction, the project would conform to SDAPCD Rule 51: • Minimize land disturbance • Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to project work areas • Suspend grading and earth moving when wind gusts exceed 25 mph unless soil is wet enough to prevent dust plumes • Cover trucks when hauling dirt • Stabilize surface of dirt piles if not removed immediately • Limit vehicular paths on unpaved surfaces and stabilize any temporary roads • Minimize unnecessary vehicular and machinery activities • Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to roadway • Revegetate disturbed land, including vehicular paths created during construction, to avoid future off-road vehicular activities • Remove unused material ***Biological Resources:*** • Braided ramps were designed to minimize wetland impacts by reducing lane widths, reducing the number of traffic lanes, and curving around the wetland where possible • Caltrans would design braided ramp columns to avoid or minimize impacts to sensitive habitat to the extent feasible	***Air Quality:*** • Use low-emission on-site mobile construction equipment where feasible • Maintain equipment in tune per manufacturer's specifications • Retard diesel engine injection timing by two to four degrees unless not recommended by manufacturer (due to lower emission output in-place) • Use reformulated, low-emission diesel fuel • Substitute electric and gasoline-powered equipment for diesel-powered equipment where feasible • Use catalytic converters on gasoline-powered equipment • Do not leave inactive construction equipment idling for prolonged periods ***Biological Resources:*** • Impacts to sensitive uplands and coastal California gnatcatcher would be mitigated for no net loss at the Deer Canyon II upper Parcel within the same watershed • Impacts to wetlands would be mitigated for no net loss at the San Dieguito W19 Mitigation Site and through other enhancements identified in the REP

Table 2.2.6
COMMON PROJECT DESIGN FEATURES—AUXILIARY LANES

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
GENERAL INFORMATION FOR AUXILIARY LANES			
Proposed auxiliary lane locations were determined in accordance with the Level of Service (LOS) D Method (weaving analysis) documented in Caltrans Highway Design Manual (HDM) Index 504.7. As further detailed in Section 7.1 of the I-5 North Coast Freeway Operations Report, LOS D weaving limits of 2,000 vehicles per hour per lane (vphpl) are specified for non-weaving main through lanes, and 1,800 vphpl are specified for weaving lanes. Caltrans proposes auxiliary lanes to help reduce congestion caused by traffic weaving. The auxiliary lanes themselves avoid the requirement to add arterials that must cross the lagoons to meet the demand of the local trips. Reasons for proposing auxiliary lanes in each of the sensitive areas are described below.	***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Auxiliary lanes reduce weaving and thus may improve traffic conditions ***Air Quality:*** • Project conforms to State Implementation Plan (SIP) and no adverse regional air quality impact would occur as a result of project implementation • Project would not adversely impact existing air quality at representative sensitive receptors within project area • Project alternatives would not violate any state or federal CO standards • Regional transportation efficiency would be increased and overall CO_2 emissions would be reduced. Project reduction in congestion is estimated to reduce 2030 CO_2 emissions in San Diego region by up to 340 tons per day • Because proposed project would reduce delay at these locations, there is potential for further reduction in GHG emissions from vehicles spending less time idling	***Air Quality:*** To minimize emission of fugitive dust, PM_{10}, and $PM_{2.5}$ during construction, the project would conform to SDAPCD Rule 51: • Minimize land disturbance • Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to project work areas • Suspend grading and earth moving when wind gusts exceed 25 mph unless soil is wet enough to prevent dust plumes • Cover trucks when hauling dirt • Stabilize surface of dirt piles if not removed immediately • Limit vehicular paths on unpaved surfaces and stabilize any temporary roads • Minimize unnecessary vehicular and machinery activities • Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to roadway • Revegetate disturbed land, including vehicular paths created during construction, to avoid future off-road vehicular activities • Remove unused material ***Biological Resources:*** • To reduce auxiliary lanes impacts, minimum width standards were used for design	***Air Quality:*** • Use low-emission on-site mobile construction equipment where feasible • Maintain equipment in tune per manufacturer's specifications • Retard diesel engine injection timing by two to four degrees unless not recommended by manufacturer (due to lower emission output in-place) • Use reformulated, low-emission diesel fuel • Substitute electric and gasoline-powered equipment for diesel-powered equipment where feasible • Use catalytic converters on gasoline-powered equipment • Do not leave inactive construction equipment idling for prolonged periods
NORTHBOUND I-5 FROM DEL MAR HEIGHTS ROAD TO VIA DE LA VALLE (Extend existing auxiliary lane to begin at the Del Mar Heights Road NB I-5 on-ramp)			
Year 2030 a.m. peak hour traffic volume on lane 5 would be 2,220 vphpl, which exceeds the LOS D weaving limit of 1,800 vphpl for weaving lanes. Year 2030 p.m. peak hour traffic volumes on lanes 1 though 3 would be 2,062 vphpl, exceeding the LOS D weaving limit of 2,000 vphpl for main lanes. The volumes on lanes 4 and 5 would be 2,062, and 2,762 vphpl, respectively, exceeding the LOS D weaving limit of 1,800 vphpl for weaving lanes. Caltrans proposes an auxiliary lane at this location to help reduce congestion caused by weaving traffic between the Del Mar Heights Road entrance ramp to NB I-5 and the Via De La Valle exit ramp from NB I-5. The proposed auxiliary lane would meet weaving requirements.	***Land Use:*** • Located in the City of San Diego, crossing over the San Dieguito River • Predominant land uses include urban and residential uses, open space (Overlook Park Open Space), and fallow agricultural land • Three parcels/properties would require partial acquisition (approximately 0.86 acre) • One parcel/property would require full take (approximately 0.1 acre) • Total length of auxiliary lane - approximately 8182 feet ***Community and Visual/Aesthetics:*** • Large retaining walls are proposed in existing cut slopes to accommodate freeway improvements • Retaining walls would decrease intactness and unity of viewshed from moderate to low levels • Views of preserved upper slopes and adjacent community would be obscured because tops of near-vertical retaining walls would block line-of-sight for many freeway viewers • Vividness would be reduced as attention of viewer is directed toward foreground views of widened freeway • Large retaining wall structures would be built in both horizontal and vertical planes and	***Community and Visual/Aesthetics:*** • Soil retaining features would be designed as “terrain contoured walls” as a visual impact minimization feature • Retaining walls would be located at or near existing mid-slope benches so the upper portion of existing slopes and their vegetation could be preserved intact • Retaining walls would have curved surfaces, sloped faces, integral earth-tone colors, and enhanced surface textures • Retaining walls would be partially screened from freeway users by landscaped slopes at their bases ***Air Quality:*** • Please refer to air quality avoidance/ minimization measures described for auxiliary lanes under General Information	***Air Quality:*** • Please refer to air quality mitigation measures described for auxiliary lanes under General Information. These mitigation measures apply to all auxiliary lanes ***Biological Resources:*** • No mitigation required

Table 2.2.6 (cont.)
COMMON PROJECT DESIGN FEATURES—AUXILIARY LANES

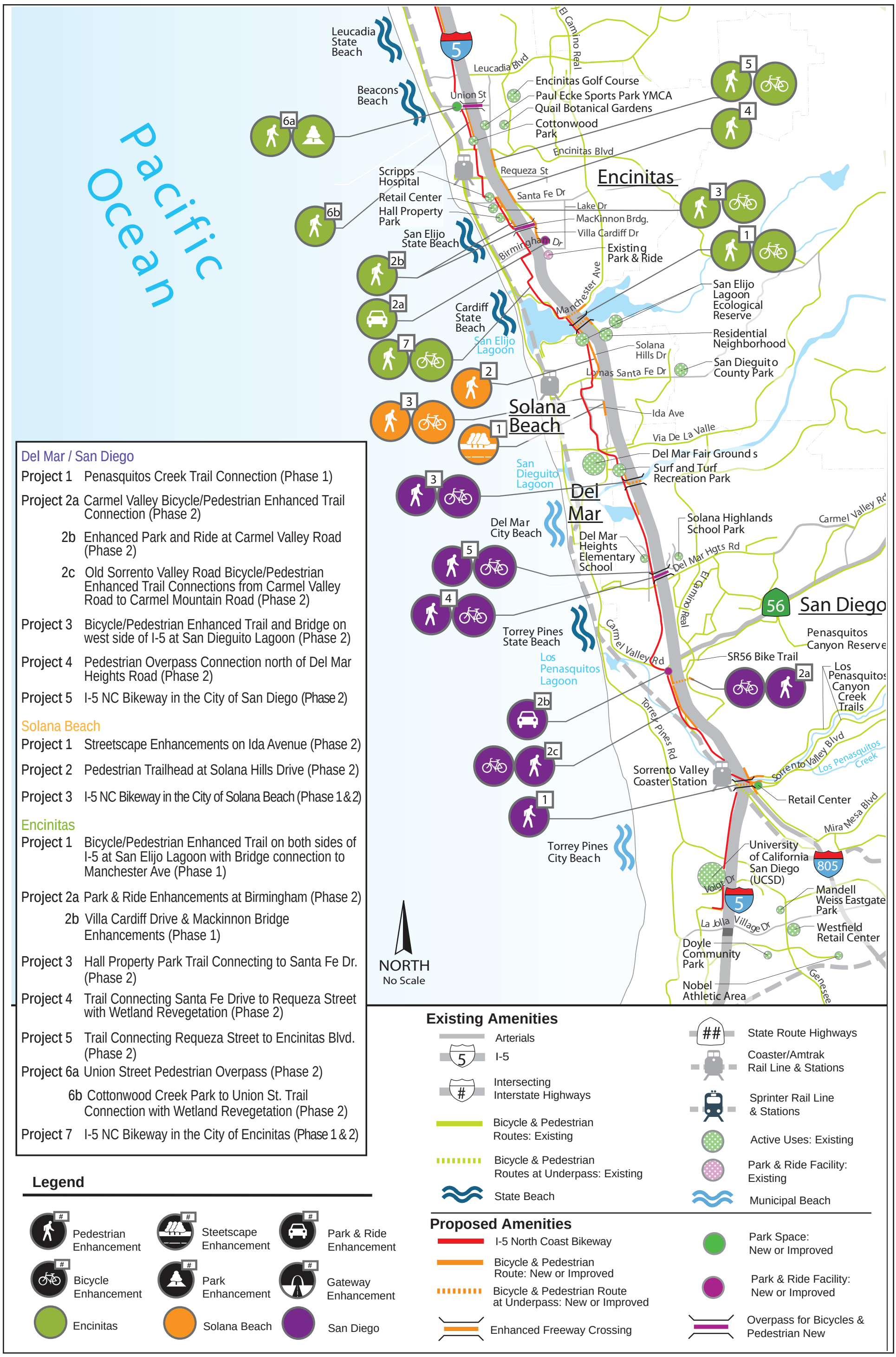
FEATURE/ JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
NORTHBOUND I-5 FROM DEL MAR HEIGHTS ROAD TO VIA DE LA VALLE (Extend existing auxiliary lane to begin at the Del Mar Heights Road NB I-5 on-ramp) (cont.)			
	would be incompatible with small-scale suburban character of community, producing a marked increase in visual contrast between I-5 and its surroundings • Change to visual character would be high ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Additional auxiliary lane would help ease congestion, and lessen bottlenecking on this segment of NB I-5 ***Water Quality/Storm water Runoff:*** • One potential site has been identified for bioswales (immediately north of the proposed auxiliary lane along NB I-5; details to be determined in the design phase) ***Air Quality:*** • Impacts/benefits relative to air quality are described for auxiliary lanes under General Information. These impacts/benefits apply to all auxiliary lanes ***Noise:*** • Eight soundwalls (S561, S563, S565, S567, S568, S569, S573, and S589) were evaluated for this segment • None of the walls met "reasonable" and/or "feasible" criteria under the Caltrans Traffic Noise Analysis Protocol, but S567 would be recommended in order to abate noise severely impacted receptors ***Biological Resources:*** • No biological impacts	• These avoidance/minimization measures apply to all auxiliary lanes ***Biological Resources:*** • To reduce auxiliary lane impacts, design includes minimum width standards • Existing retaining wall would be retained to minimize impacts	
NORTHBOUND I-5 FROM LOMAS SANTA FE DRIVE TO MANCHESTER AVENUE (Extend existing auxiliary lane to start at Lomas Santa Fe Drive)			
Weaving analysis indicates that year 2030 p.m. peak hour traffic volume on lanes 1 through 4 would be 2,218 vphpl; exceeding the LOS D weaving limits of 2,000 vphpl for main lanes, and 1,800 vphpl for weaving lanes, respectively. An auxiliary lane at this location would help reduce congestion caused by weaving traffic between the Lomas Santa Fe Drive entrance ramp to NB I-5 and the Manchester Avenue exit ramp from NB I-5. The auxiliary lane would meet weaving requirements.	***Land Use:*** • Located in the City of Solana Beach, crossing over the San Elijo Lagoon • Predominant land uses include urban and residential adjacent to the southern segment of NB I-5, and San Elijo Lagoon open space adjacent to the northern section of NB I-5 • Six parcels/properties would require partial acquisition (approximately 0.12 acre) • Total length of auxiliary lane - approximately 4540 feet ***Water Quality/Storm water Runoff:*** • Two potential sites have been identified for bioswales at this segment of NB I-5 (both on east side of I-5 between Lomas Santa Fe Drive and the San Elijo Lagoon County Park and Ecological Reserve; details to be determined in the design phase) ***Air Quality:*** • Impacts/benefits relative to air quality are described for auxiliary lanes under General Information. These impacts/benefits apply to all auxiliary lanes ***Noise:*** • Three soundwalls (S614, S622 Option 1, and S622 Option 2) were evaluated for this segment • S614 would be recommended, as it meets "reasonable" and "feasible" criteria under the Caltrans Traffic Noise Analysis Protocol • S622 options do not meet "reasonable" and "feasible" criteria under the Caltrans Traffic Noise Analysis Protocol; however, Option 2 would be recommended to abate for severely impacted receptors ***Biological Resources:*** • Portion that has to be extended is in vicinity of a proposed retaining wall. No additional impacts would occur	***Air Quality:*** • Please refer to air quality avoidance/ minimization measures described for auxiliary lanes under General Information. These avoidance/minimization measures apply to all auxiliary lanes ***Biological Resources:*** • To reduce auxiliary lane impacts, design includes minimum width standards • Retaining wall proposed on cut slope to minimize impacts	***Air Quality:*** • Please refer to air quality mitigation measures described for auxiliary lanes under General Information. These mitigation measures apply to all auxiliary lanes ***Biological Resources:*** • No mitigation required

Table 2.2.6 (cont.)
COMMON PROJECT DESIGN FEATURES—AUXILIARY LANES

FEATURE/ JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
NORTHBOUND I-5 FROM MANCHESTER AVENUE TO BIRMINGHAM DRIVE (Proposed new auxiliary lane**)**			
Weaving analysis indicates that year 2030 p.m. peak hour traffic volume on lanes 1 through 4 would be 2,093 vphpl; exceeding the LOS D weaving limits of 2,000 vphpl for main lanes, and 1,800 vphpl for weaving lanes, respectively. Caltrans proposes an auxiliary lane at this location to help reduce congestion caused by weaving traffic between the Manchester Avenue entrance ramp to NB I-5 and the Birmingham Drive exit ramp from NB I-5. The proposed auxiliary lane would meet weaving requirements.	***Land Use:*** • Located in the City of Solana Beach, crossing the San Elijo Lagoon • Predominant land uses include urban and residential, as well as San Elijo Lagoon open space • Four parcels/properties would require partial acquisition (approximately 3.14 acres) • Total length of auxiliary lane - approximately 3937 feet ***Water Quality/Storm water Runoff:*** • One potential site has been identified for a bioswale (located on the east side of I-5, on the opposite side of the I-5 from the existing view point; details to be determined in the design phase) ***Air Quality:*** • Impacts/benefits relative to air quality are described for auxiliary lanes under General Information. These impacts/benefits apply to all auxiliary lanes ***Noise:*** • Seven soundwalls (S631, S633, S635, S640, S644, S646, and S647) were evaluated on this segment • S640 and S647 do not meet “reasonable” and/or “feasible” criteria under the Caltrans Traffic Noise Analysis Protocol, and are not recommended • S631, S633, and S635, would be recommended for construction • S644 and S646 do not meet “reasonable” and/or “feasible” criteria under the Caltrans Traffic Noise Analysis Protocol, but could shield severely impacted receptors. They would be recommended for construction if pads can be built to support the walls	***Air Quality:*** • Please refer to air quality avoidance/ minimization measures described for auxiliary lanes under General Information. These avoidance/minimization measures apply to all auxiliary lanes ***Biological Resources:*** • Minimum lane width standards were used to reduce the impacts • Retaining walls proposed in portions of the area to reduce impacts to sensitive habitats and species	***Air Quality:*** • Please refer to air quality mitigation measures described for auxiliary lanes under General Information. These mitigation measures apply to all auxiliary lanes ***Biological Resources:*** • Impacts to sensitive uplands and coastal California gnatcatcher would be mitigated for no net loss at the San Elijo Uplands • Additional enhancements are identified in the REP
SOUTHBOUND I-5 FROM BIRMINGHAM DRIVE TO MANCHESTER AVENUE (Proposed new auxiliary lane)			
Weaving analysis indicates that year 2030 a.m. peak hour traffic volume on lane 4 would be 2,000 vphpl; exceeding the LOS D weaving limit of 1,800 vphpl for weaving lanes. An auxiliary lane is proposed at this location to help reduce congestion caused by weaving traffic between the Birmingham Drive entrance ramp to SB I-5 and the Manchester Avenue exit ramp from SB I-5. The auxiliary lane would meet weaving requirements.	***Land Use:*** • Located in the City of Solana Beach, crossing the San Elijo Lagoon • Predominant land uses include urban and residential, industrial and commercial, as well as San Elijo Lagoon open space • Three parcels/properties would require partial acquisition (approximately 0.76 acre) • Total length of auxiliary lane - approximately 3553 feet ***Water Quality/Storm water Runoff:*** • Two potential sites have been identified for bioswales along the northern portion of this segment of SB I-5 (details to be determined in the design phase) ***Air Quality:*** • Impacts/benefits relative to air quality are described for auxiliary lanes under General Information. These impacts/benefits apply to all auxiliary lanes ***Noise:*** • Please refer to the discussion of soundwalls for this segment under discussion for the NB section above ***Biological Resources:*** • Impacts would include 0.06 acre of coastal sage scrub (including disturbed) • No impacts to sensitive species	***Air Quality:*** • Please refer to air quality avoidance/ minimization measures described for auxiliary lanes under General Information. These avoidance/minimization measures apply to all auxiliary lanes ***Biological Resources:*** • Minimum lane width standards were used to reduce impacts	***Air Quality*** • Please refer to air quality mitigation measures described for auxiliary lanes under General Information. These mitigation measures apply to all auxiliary lanes ***Biological Resources:*** • Impacts to sensitive uplands would be mitigated for no net loss at the San Elijo Uplands • Additional enhancements are identified in the REP

Table 2.2.6 (cont.)
COMMON PROJECT DESIGN FEATURES—AUXILIARY LANES

FEATURE/ JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
NORTHBOUND I-5 FROM CANNON ROAD TO TAMARACK AVENUE (Extend existing merge lane to terminate at the Tamarack Avenue NB I-5 off-ramp)			
Weaving analysis indicates that year 2030 p.m. peak hour traffic volume on lane 4 would be 1,980 vphpl; exceeding the LOS D weaving limit of 1,800 vphpl for weaving lanes. An auxiliary lane is proposed at this location to help reduce congestion caused by weaving traffic between the existing Cannon Road entrance ramp (existing merge lane) to NB I-5 and the Tamarack Avenue exit ramp from NB I-5. The auxiliary lane would meet weaving requirements.	***Land Use:*** • Located in the City of Carlsbad, crossing the Agua Hedionda Lagoon • Predominant land uses include agricultural, urban, residential, and commercial • Three parcels/properties would require partial acquisition (approximately 5.11 acres) • Total length of auxiliary lane - approximately 4331 feet ***Water Quality/Storm water Runoff:*** • Proposed bridge design incorporates results of lagoon hydrology studies and recommended methods to enhance water flow under the I-5 bridge ***Air Quality:*** • Impacts/benefits relative to air quality are described for auxiliary lanes under General Information. These impacts/benefits apply to all auxiliary lanes ***Noise:*** • Five soundwalls (S796, S798, S799, S801, and S802) were evaluated for this segment • S796 and S799 would not meet "reasonable" and/or "feasible" criteria under the Caltrans Traffic Noise Analysis Protocol, and would not be recommended. Severely impacted receptors in the vicinity of S799 would be recommended for individual abatement • S798, S801, and S802 meet "reasonable" and "feasible" criteria under the Caltrans Traffic Noise Analysis Protocol, and would be recommended ***Biological Resources:*** • Impacts would include 0.04 acre of coastal sage scrub, 0.37 acre of ACOE/State wetland (filled), and 0.03 acre of ACOE/State wetland (shaded) • No impacts to sensitive species	***Air Quality:*** • Please refer to air quality avoidance/ minimization measures described for auxiliary lanes under General Information. These avoidance/minimization measures apply to all auxiliary lanes ***Biological Resources:*** • To reduce the impacts of the auxiliary lanes, the minimum standards were used for width • Removal of the DAR at Cannon Road substantially reduced impacts to Agua Hedionda Lagoon • Auxiliary lanes in each direction would be accommodated in the extra width needed for bridge replacement staging associated with the extension of one HOV in the median prior to bridge replacement	***Air Quality:*** • Please refer to air quality mitigation measures described for auxiliary lanes under General Information. These mitigation measures apply to all auxiliary lanes ***Biological Resources:*** • Impacts to sensitive uplands would be mitigated for no net loss at Hallmark Mitigation Site • Impacts to wetlands would be mitigated for no net loss at Hallmark Mitigation Site and through other enhancements identified in the REP
SOUTHBOUND I-5 TAMARACK AVENUE TO CANNON ROAD (Proposed new auxiliary lane)			
Weaving analysis indicates that year 2030 a.m. peak hour traffic volume on lane 4 would be 1,930 vphpl; exceeding the LOS D weaving limit of 1,800 vphpl for weaving lanes. An auxiliary lane is proposed at this location to help reduce congestion caused by weaving traffic between the Tamarack Avenue entrance ramp to SB I-5 and the Cannon Road exit ramp from SB I-5. The auxiliary lane would meet weaving requirements.	***Land Use:*** • Located in the City of Carlsbad, crossing Agua Hedionda Lagoon • Predominant land uses include urban, residential, and industrial (Encinas Power Plant) • Three parcels/properties would require partial acquisition (approximately 3.63 acres) • Total length of auxiliary lane - approximately 4593 feet ***Utilities and Emergency Services:*** • Four existing transmission towers to be relocated immediately west of existing location north of I-5 / Cannon Road intersection (details to be determined in the design phase) ***Water Quality/Storm water Runoff:*** • Proposed bridge design incorporates results of lagoon hydrology studies and recommended methods to enhance water flow under I-5 bridges ***Air Quality:*** • Impacts/benefits relative to air quality are described for auxiliary lanes under General Information. These impacts/benefits apply to all auxiliary lanes ***Noise:*** • Please refer to the discussion of soundwalls for the Tamarack Avenue to Cannon Road auxiliary lane in the NB section above	***Air Quality:*** • Please refer to air quality avoidance/ minimization measures described for auxiliary lanes under General Information. These avoidance/minimization measures apply to all auxiliary lanes ***Biological Resources:*** • To reduce the impacts of the auxiliary lanes, the minimum standards were used for width • Removal of the DAR at Cannon Road substantially reduced impacts to Agua Hedionda Lagoon • Auxiliary lanes in each direction would be accommodated in the extra width needed for bridge replacement staging associated with the extension of one HOV in the median prior to bridge replacement	***Air Quality:*** • Please refer to air quality mitigation measures described for auxiliary lanes under General Information. These mitigation measures apply to all auxiliary lanes ***Biological Resources:*** • Impacts to sensitive uplands would be mitigated for no net loss at Hallmark Mitigation Site • Impacts to wetlands would be mitigated for no net loss at Hallmark Mitigation Site and through other enhancements identified in the REP



Del Mar / San Diego

Project 1 Penasquitos Creek Trail Connection (Phase 1)

Project 2a Carmel Valley Bicycle/Pedestrian Enhanced Trail Connection (Phase 2)

2b Enhanced Park and Ride at Carmel Valley Road (Phase 2)

2c Old Sorrento Valley Road Bicycle/Pedestrian Enhanced Trail Connections from Carmel Valley Road to Carmel Mountain Road (Phase 2)

Project 3 Bicycle/Pedestrian Enhanced Trail and Bridge on west side of I-5 at San Dieguito Lagoon (Phase 2)

Project 4 Pedestrian Overpass Connection north of Del Mar Heights Road (Phase 2)

Project 5 I-5 NC Bikeway in the City of San Diego (Phase 2)

Solana Beach

Project 1 Streetscape Enhancements on Ida Avenue (Phase 2)

Project 2 Pedestrian Trailhead at Solana Hills Drive (Phase 2)

Project 3 I-5 NC Bikeway in the City of Solana Beach (Phase 1 & 2)

Encinitas

Project 1 Bicycle/Pedestrian Enhanced Trail on both sides of I-5 at San Elijo Lagoon with Bridge connection to Manchester Ave (Phase 1)

Project 2a Park & Ride Enhancements at Birmingham (Phase 2)

2b Villa Cardiff Drive & Mackinnon Bridge Enhancements (Phase 1)

Project 3 Hall Property Park Trail Connecting to Santa Fe Dr. (Phase 2)

Project 4 Trail Connecting Santa Fe Drive to Requeza Street with Wetland Revegetation (Phase 2)

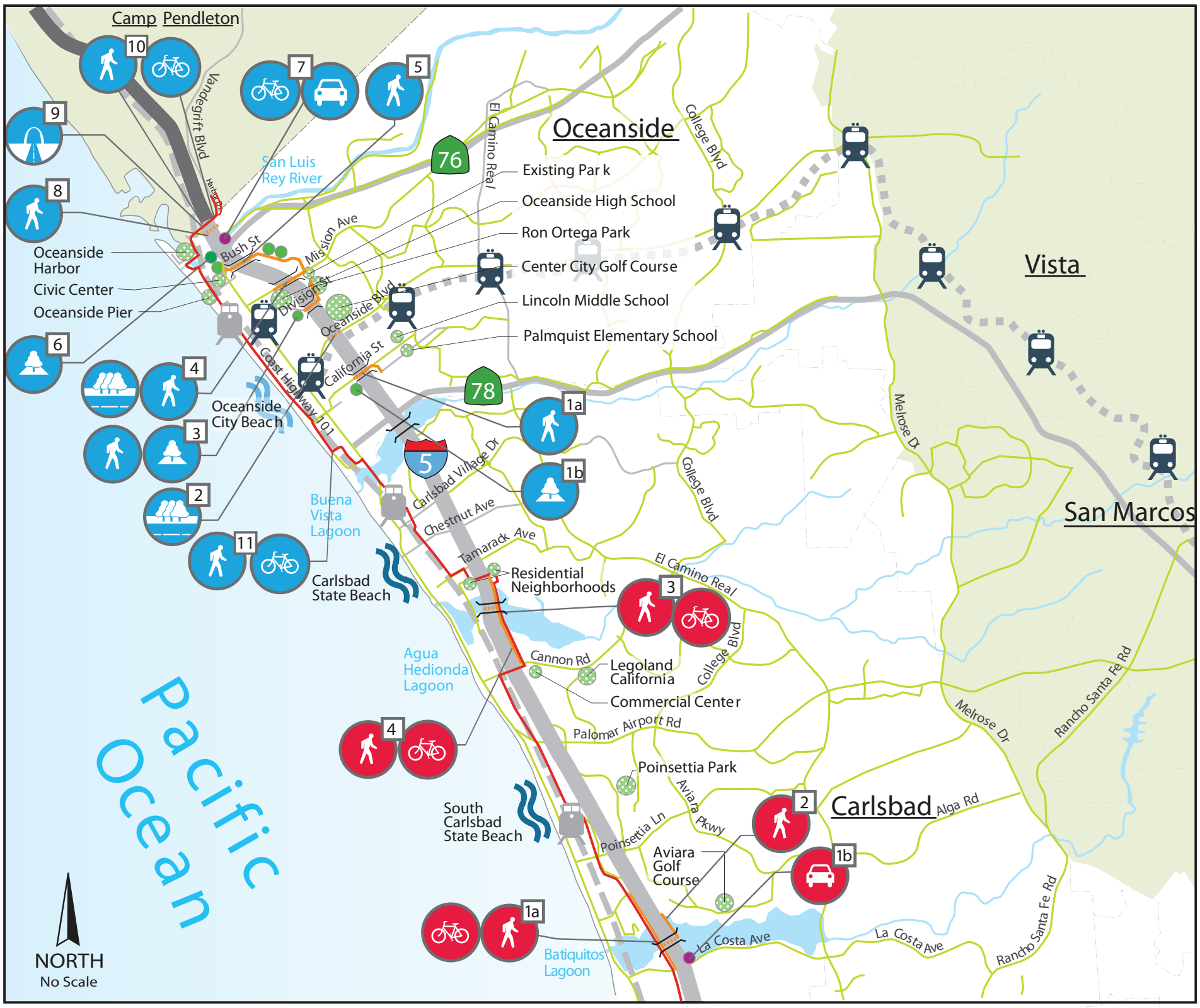
Project 5 Trail Connecting Requeza Street to Encinitas Blvd. (Phase 2)

Project 6a Union Street Pedestrian Overpass (Phase 2)

6b Cottonwood Creek Park to Union St. Trail Connection with Wetland Revegetation (Phase 2)

Project 7 I-5 NC Bikeway in the City of Encinitas (Phase 1 & 2)

Figure 2-2.1a: Community Enhancements Overview - South



Carlsbad

Project 1a Bicycle/Pedestrian Enhanced Trail and Bridge on west side of Batiquitos Lagoon (Phase 2)

1b Park and Ride Enhancement at La Costa Avenue (Phase 2)

Project 2 Trail on northeast side of I-5 at Batiquitos Lagoon (Phase 2)

Project 3 Bicycle/Pedestrian Enhanced Trail and Bridge on east side of I-5 at Agua Hedionda Lagoon (Phase 3)

Project 4 I-5 NC Bikeway in the City of Carlsbad (Phase 2 & 3)

Oceanside

Project 1 Pocket Park and Pedestrian Path at California Street (Phase 3)

Project 2 Oceanside Blvd Pedestrian Streetscape Enhancement (Phase 3)

Project 3 Division Street Bicycle/Pedestrian Enhancements (Phase 3)

Project 4 Mission Avenue Bicycle/Pedestrian Enhancements (Phase 3)

Project 5 Bush Street Bicycle/Pedestrian Enhancements and Community Gardens (Phase 3)

Project 6 Community Open Space Park and/or Community Gardens (Phase 3)

Project 7 SR-76 Underpass: New Parking and Trailhead (Phase 3)

Project 8 Pedestrian Underpass Improvements north of San Luis Rey River (Phase 3)

Project 9 Regional Gateway Feature at Harbor Drive (Phase 3)

Project 10 Harbor Drive/Camp Pendleton Pedestrian and Bicycle Enhancements (Phase 3)

Project 11 I-5 NC Bikeway in the City of Oceanside (Phase 3)

Legend

Pedestrian Enhancement
Steetscape Enhancement
Park & Ride Enhancement
Bicycle Enhancement
Park Enhancement
Gateway Enhancement
Oceanside
Carlsbad

Existing Amenities

Arterials
State Route Highways
I-5
Coaster/Amtrak Rail Line & Stations
Intersecting Interstate Highways
Sprinter Rail Line & Stations
Bicycle & Pedestrian Routes: Existing
Active Uses: Existing
Bicycle & Pedestrian Routes at Underpass: Existing
Park & Ride Facility: Existing
State Beach
Municipal Beach

Proposed Amenities

I-5 North Coast Bikeway
Park Space: New or Improved
Bicycle & Pedestrian Route: New or Improved
Park & Ride Facility: New or Improved
Bicycle & Pedestrian Route at Underpass Improved
Enhanced Freeway Crossing
Overpass for Bicycles & Pedestrian New

Figure 2-2.1b: Community Enhancements Overview - North

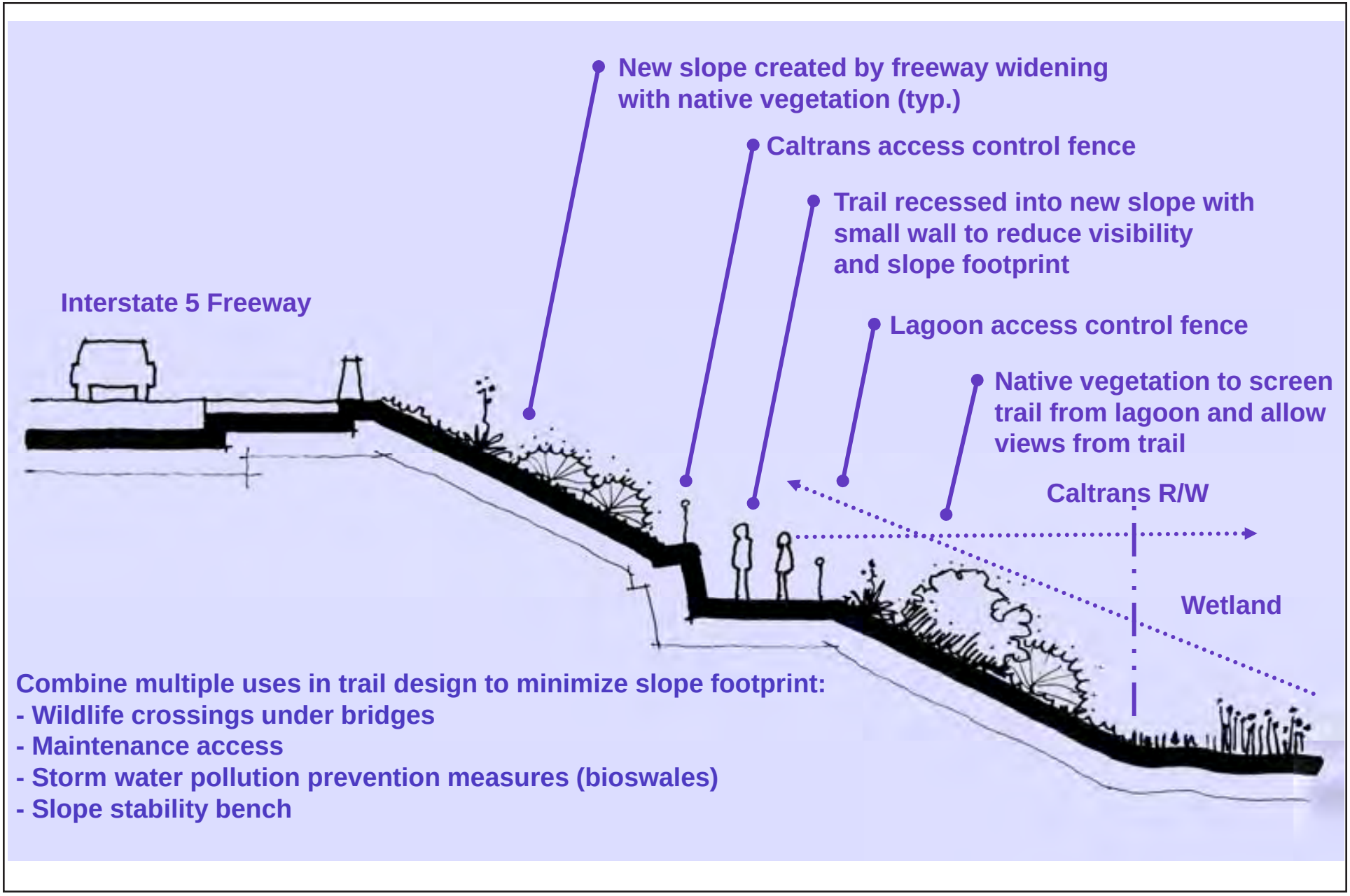


Figure 2-2.2: Typical Lagoon Trail Cross-section

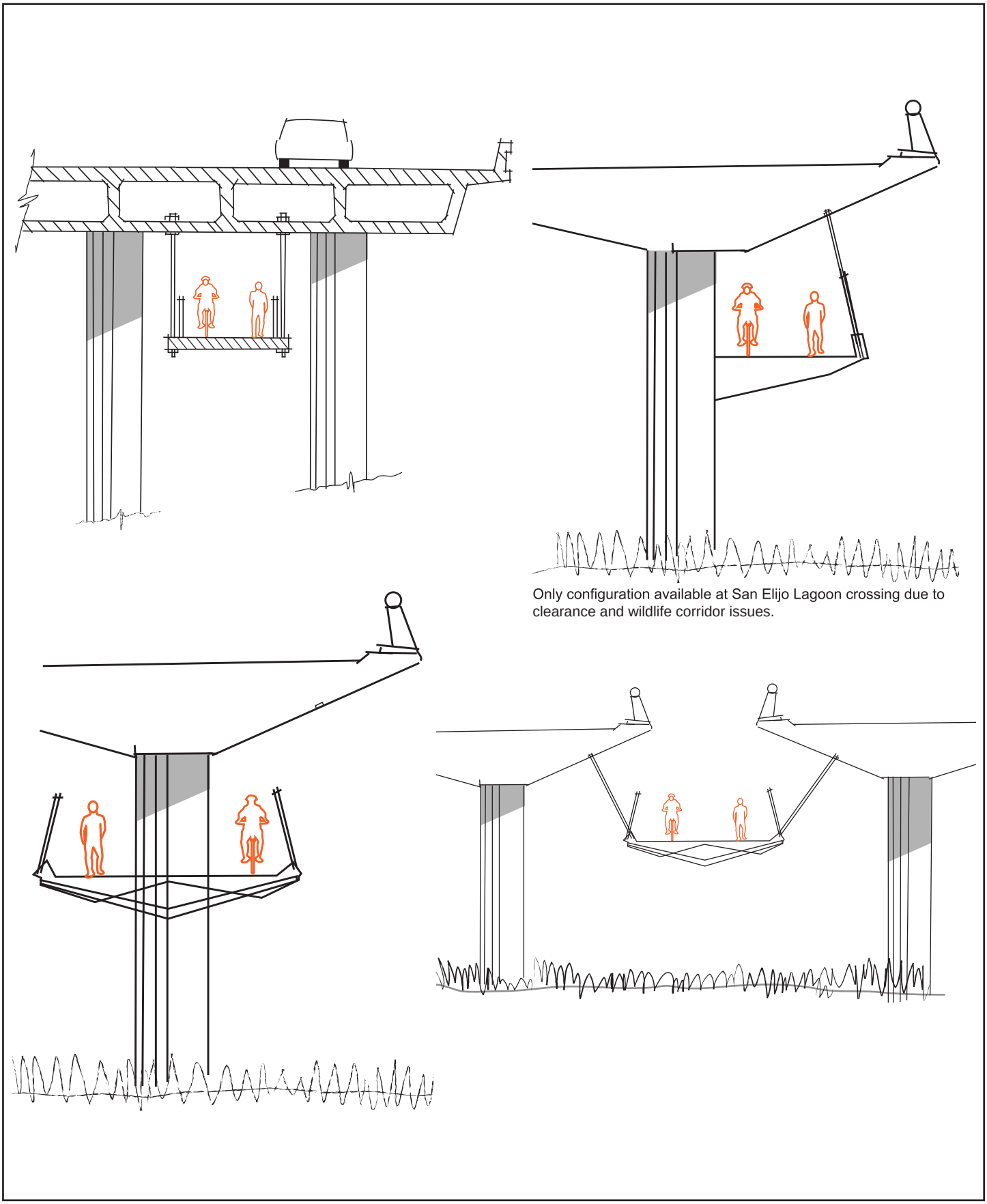


Figure 2-2.3: Suspended Bike/Pedestrian Path Typical Configurations

Figure 2-2.4a: North Coast Bikeway Elements

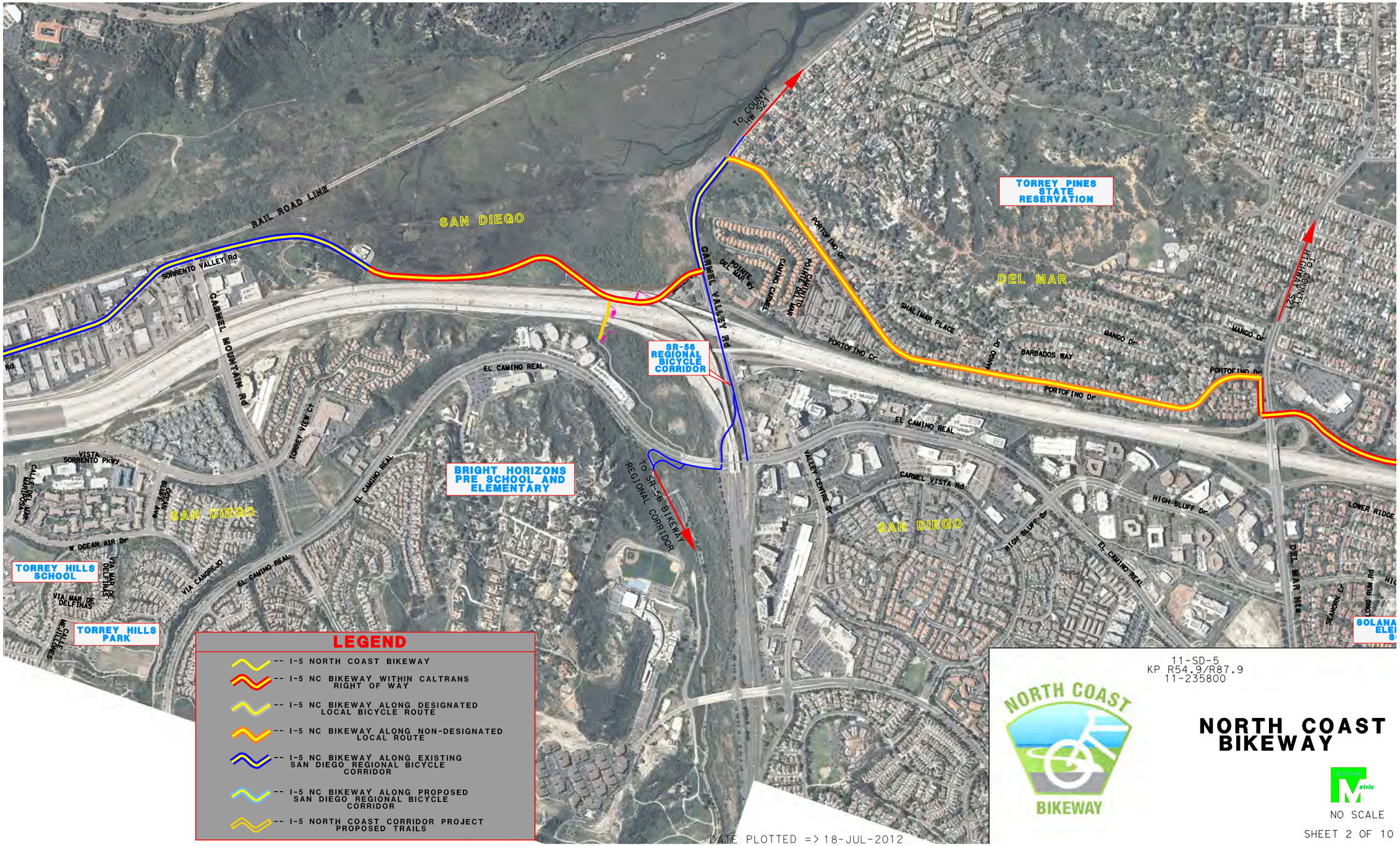


Figure 2-2.4b: North Coast Bikeway Elements

Figure 2-2.4c: North Coast Bikeway Elements

Figure 2-2.4d: North Coast Bikeway Elements

Figure 2-2.4e: North Coast Bikeway Elements

Figure 2-2.4f: North Coast Bikeway Elements

Figure 2-2.4g: North Coast Bikeway Elements

Figure 2-2.4h: North Coast Bikeway Elements

Figure 2-2.4i: North Coast Bikeway Elements

Figure 2-2.4j: North Coast Bikeway Elements

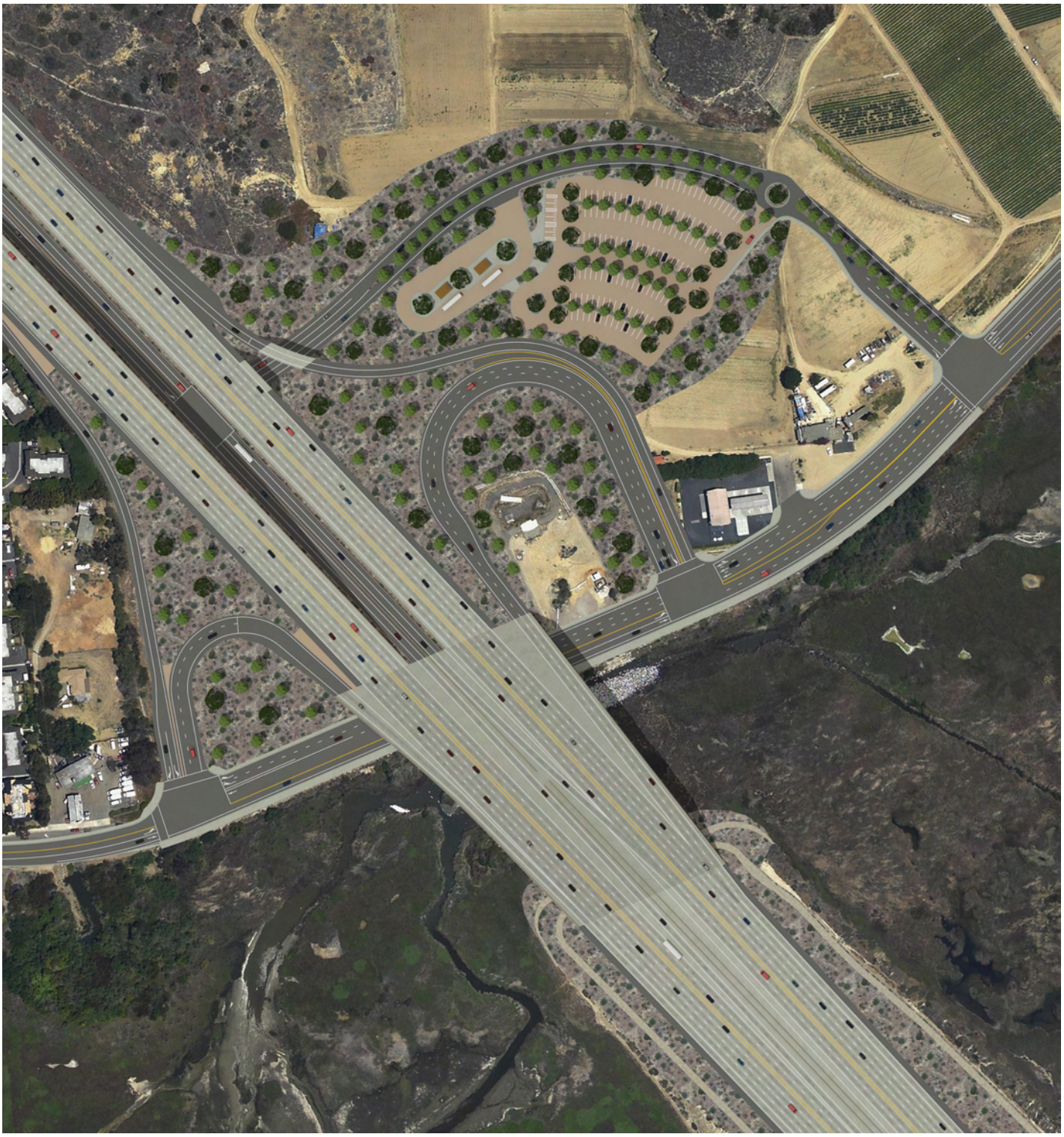


Figure 2-2.5: Manchester DAR Park and Ride Illustration

SENSITIVE HABITAT AREA

Recursos Ambientales Sensibles

DOGS AND BICYCLES PROHIBITED
Se prohibe el paso de perros y bicicletas

YOUR ASSISTANCE IS NEEDED TO PROTECT BIOLOGICAL RESOURCES
Su asistencia es necesaria para proteger los recursos biológicos

TO REPORT A VIOLATION
CALL 000-000-0000

PHONE NUMBER WILL BE LAGOON FOUNDATION OR AGENCY CONTACT

Figure 2-2.6: Example Sensitive Habitat Area Sign

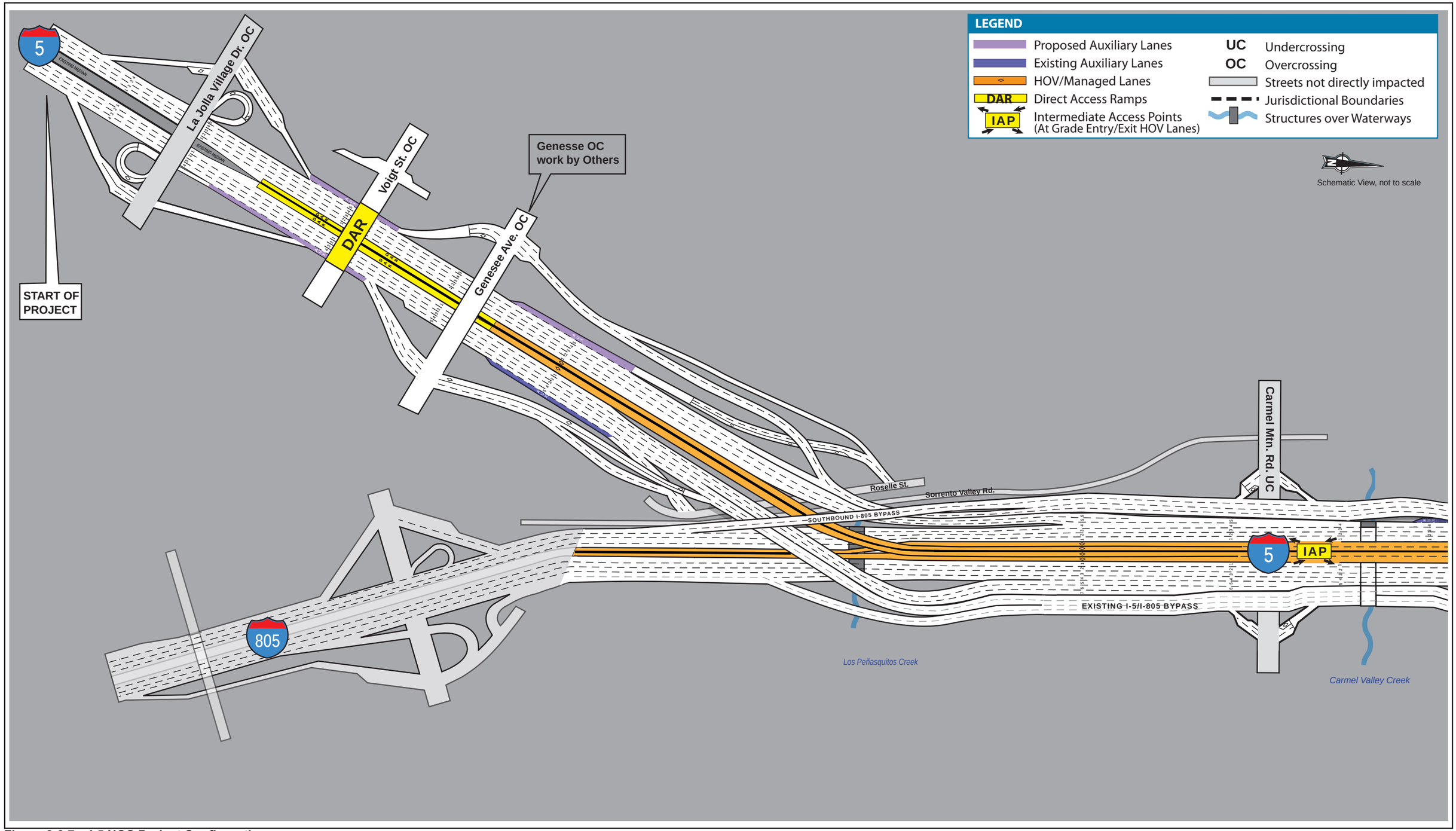


Figure 2-2.7a: I-5 NCC Project Configuration

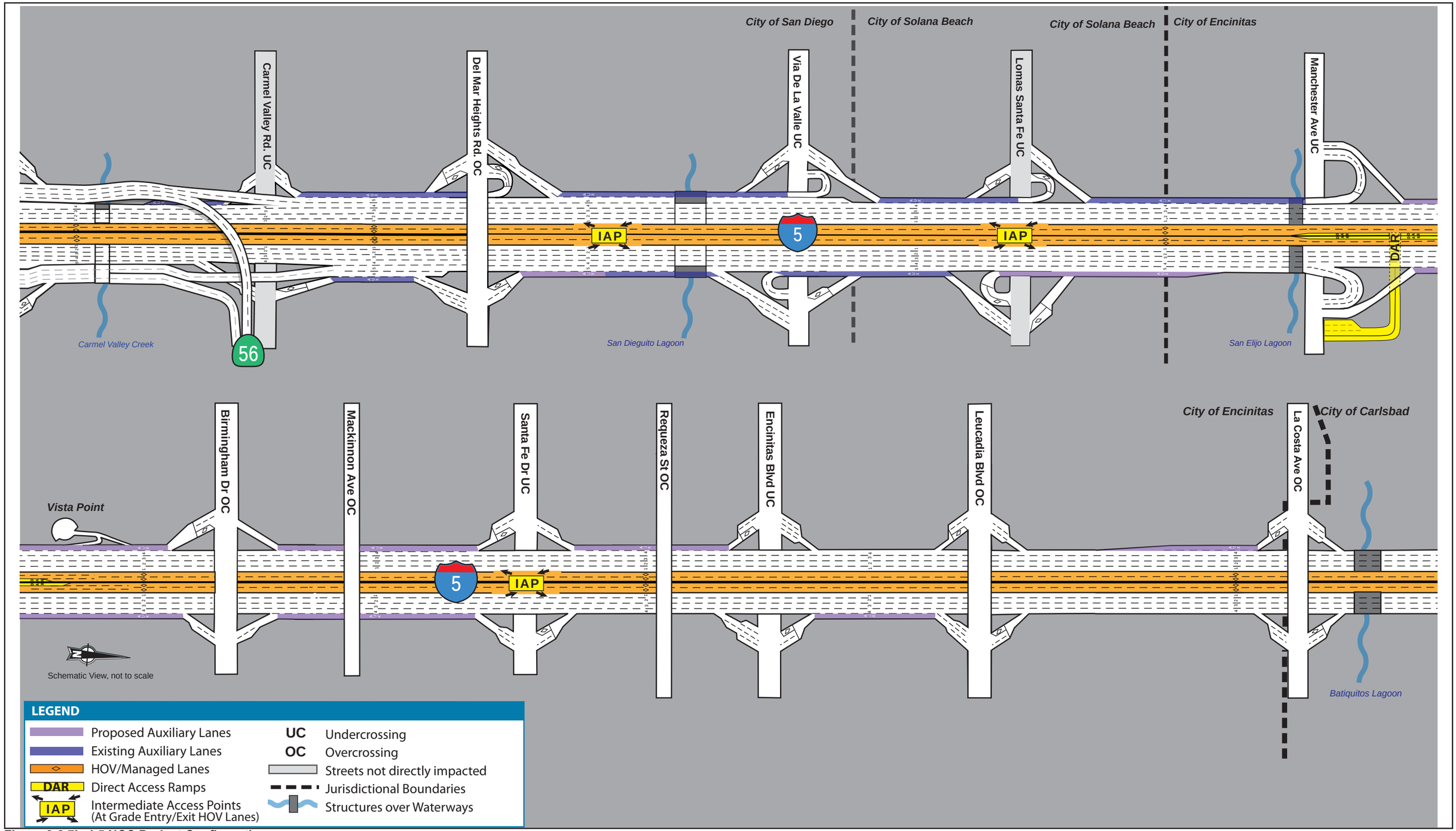


Figure 2-2.7b: I-5 NCC Project Configuration

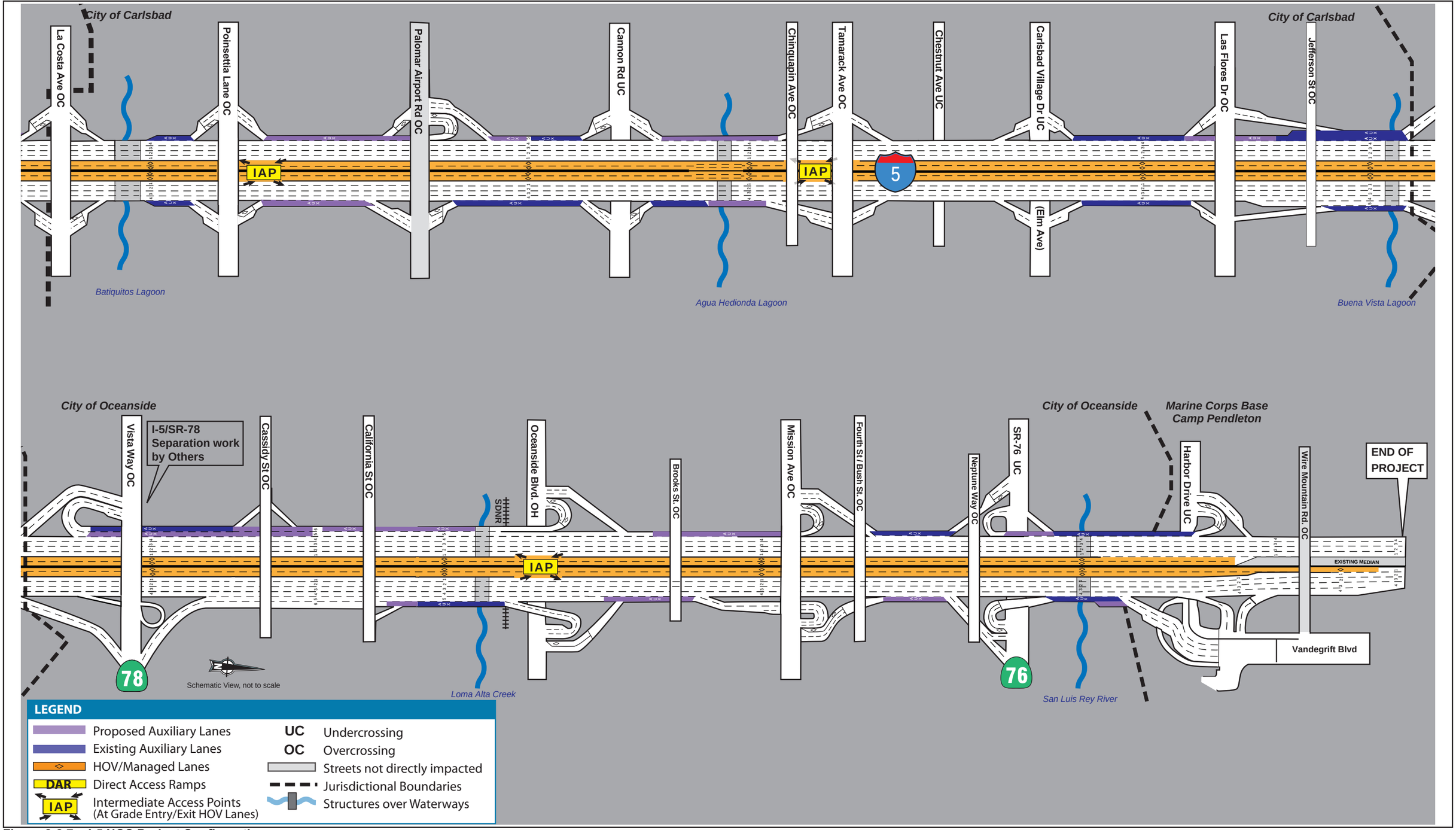
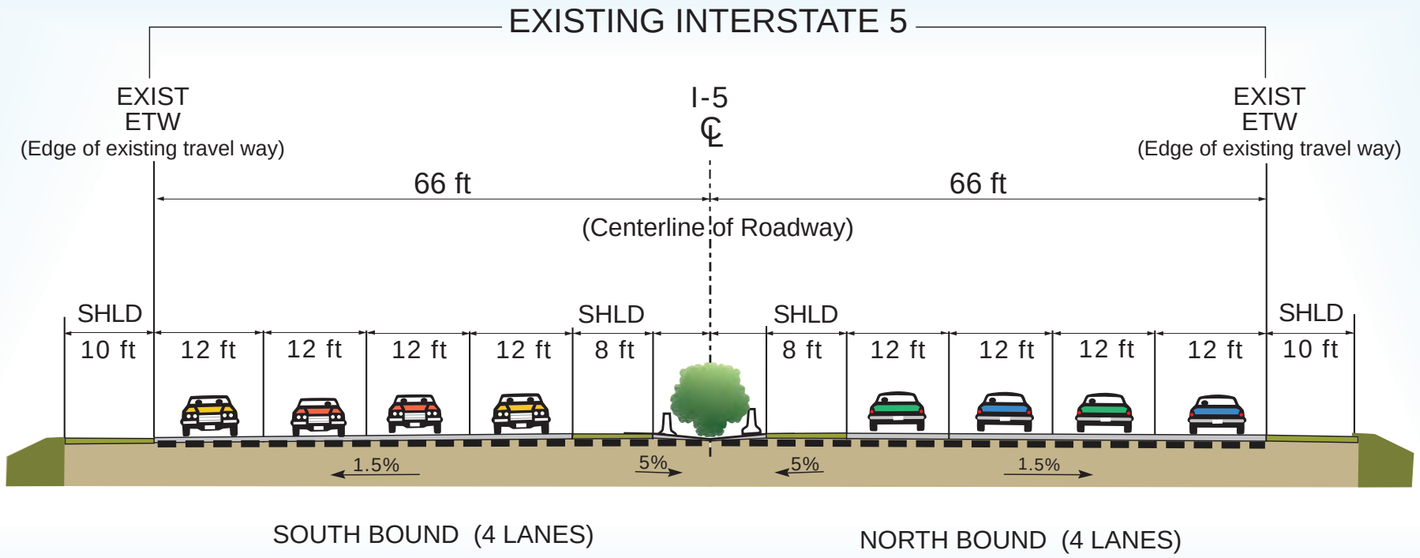
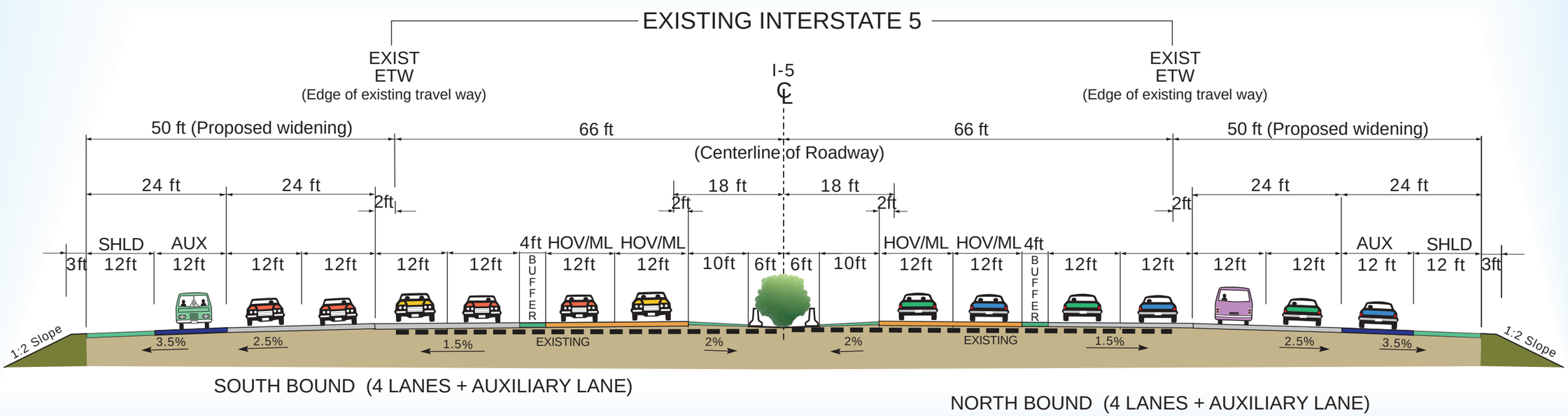


Figure 2-2.7c: I-5 NCC Project Configuration



NO BUILD ALTERNATIVE



8+4 WITH BUFFER ALTERNATIVE

Figure 2-2.8: LPA Cross Section

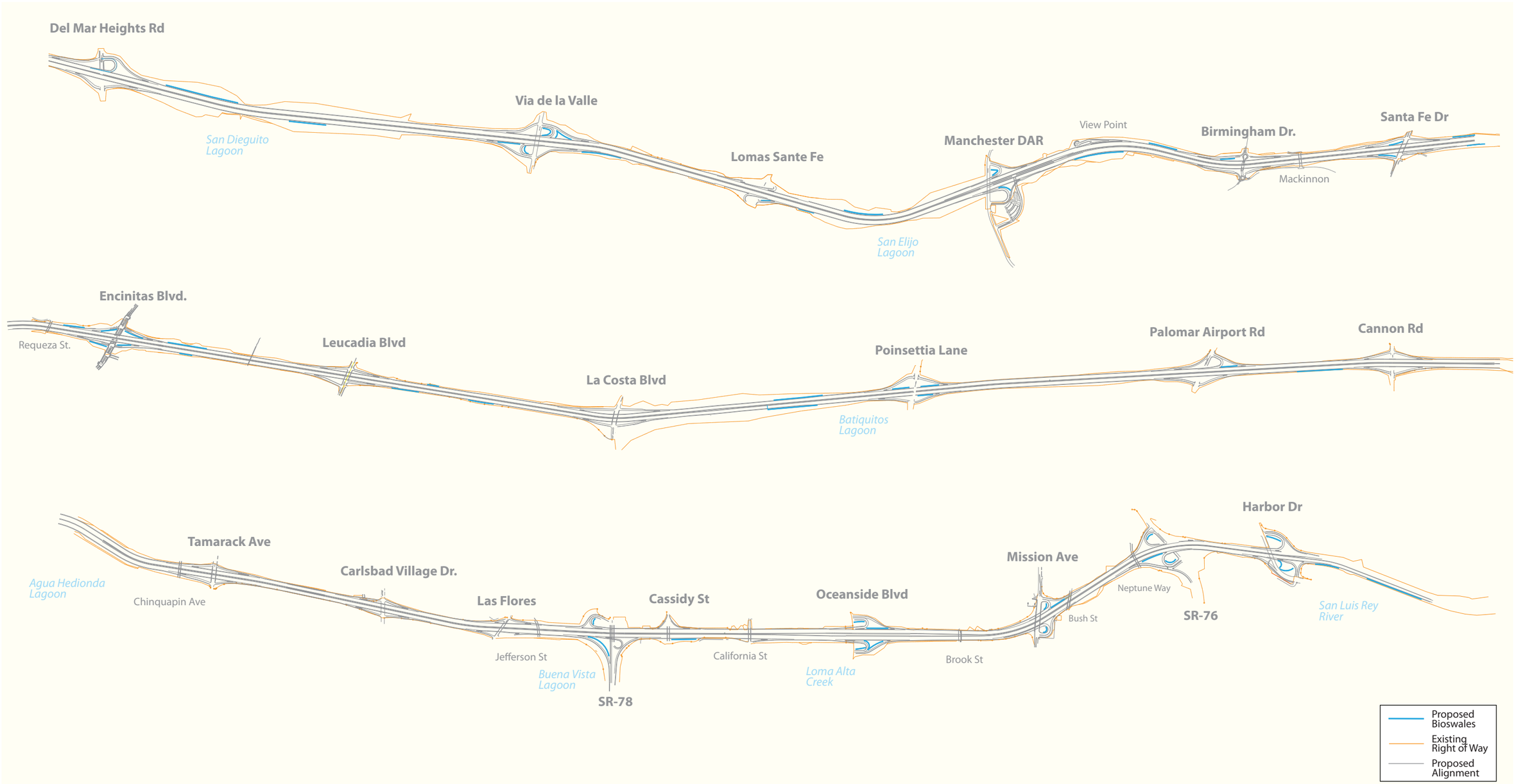


Figure 2-2.9: Approved Treatment BMP Locations

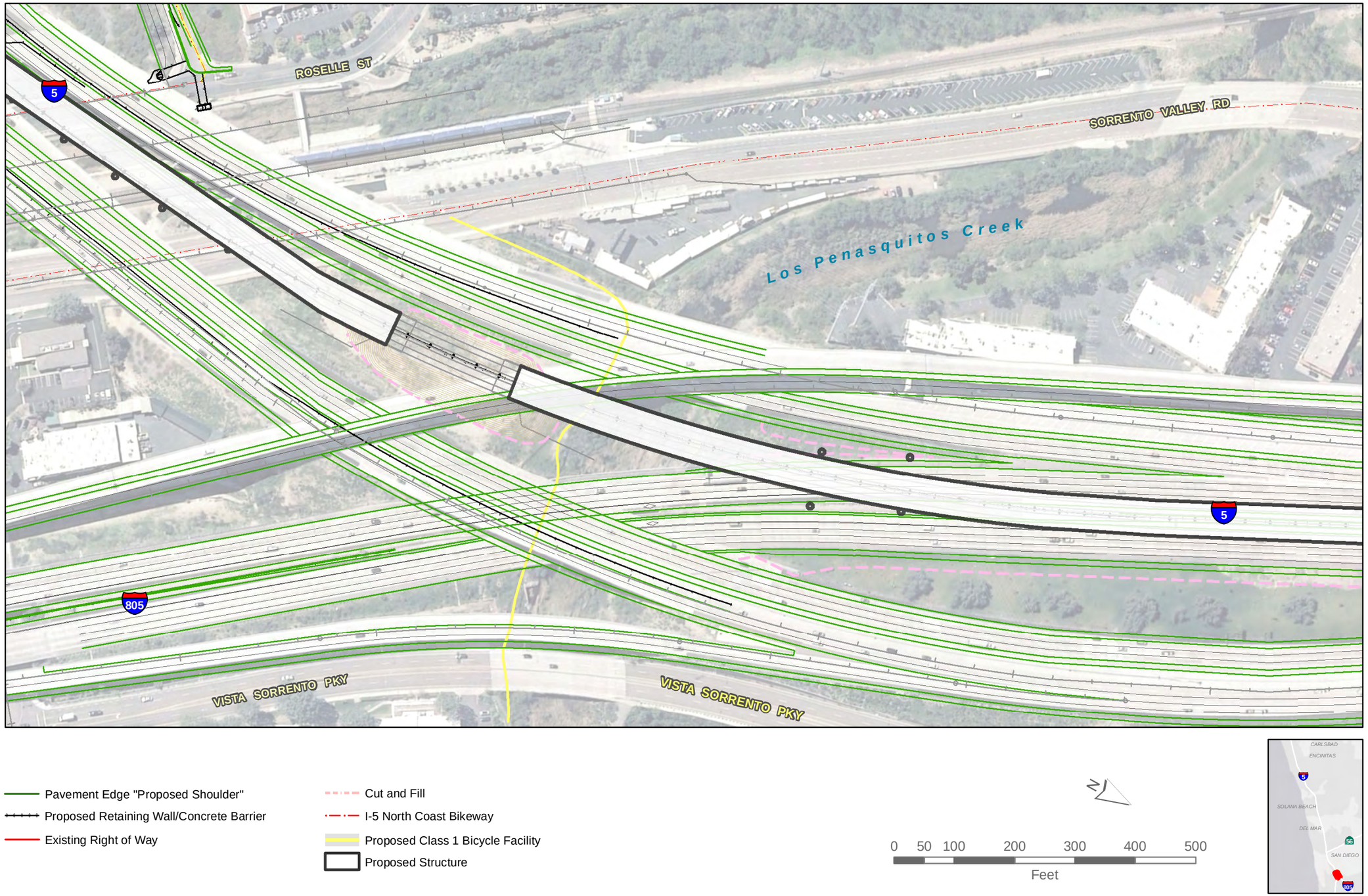
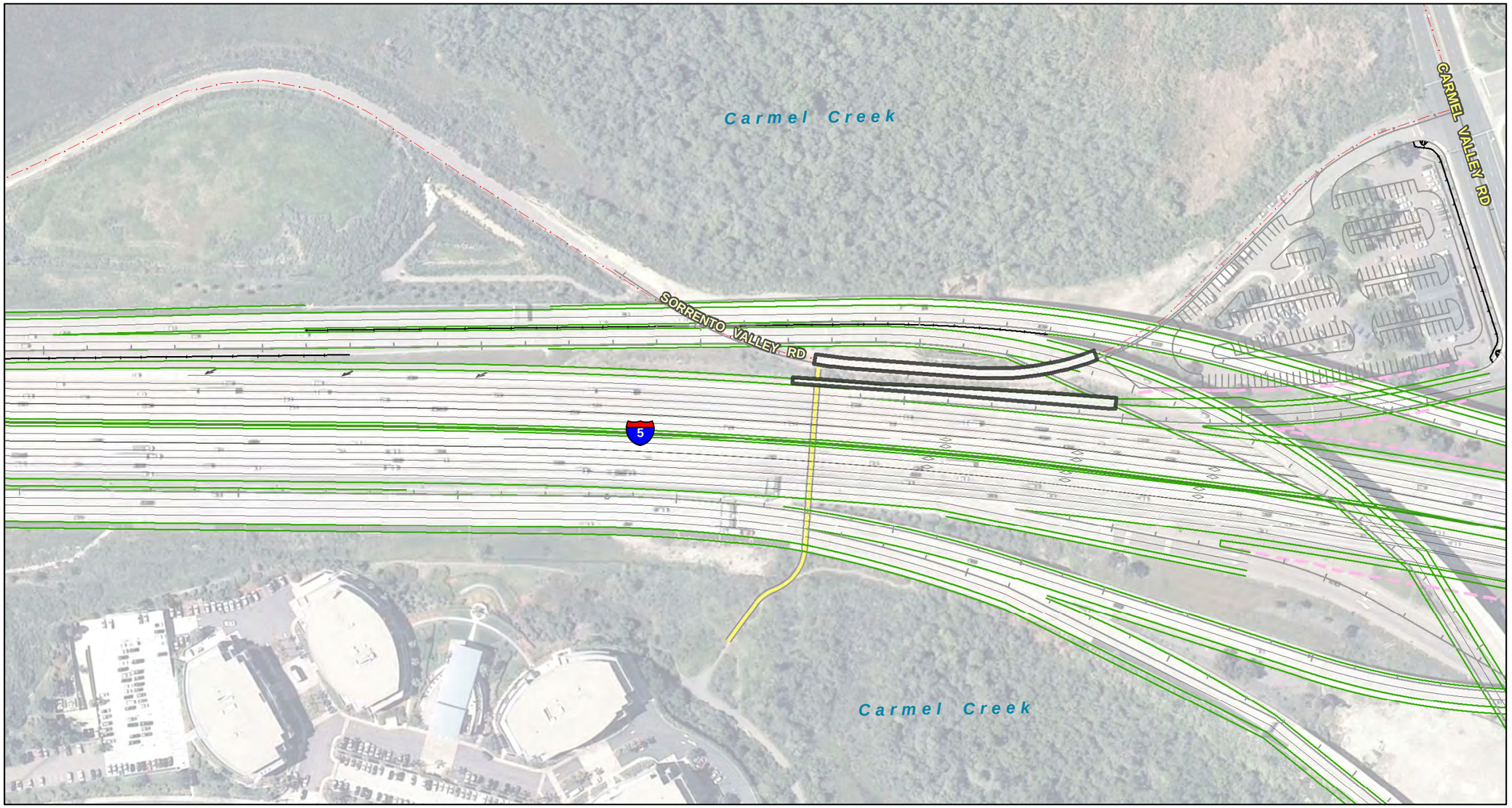


Figure 2-2.10a: 8+4 Buffer Project Features Map: Los Peñasquitos Lagoon



Pavement Edge "Proposed Shoulder"
Proposed Retaining Wall/Concrete Barrier
Existing Right of Way
Cut and Fill
I-5 North Coast Bikeway
Proposed Class 1 Bicycle Facility
Proposed Structure

0 50 100 200 300 400 500
Feet

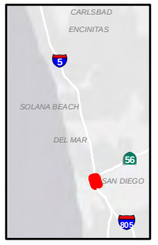


Figure 2-2.10b: 8+4 Buffer Project Features Map: Carmel Valley Creek

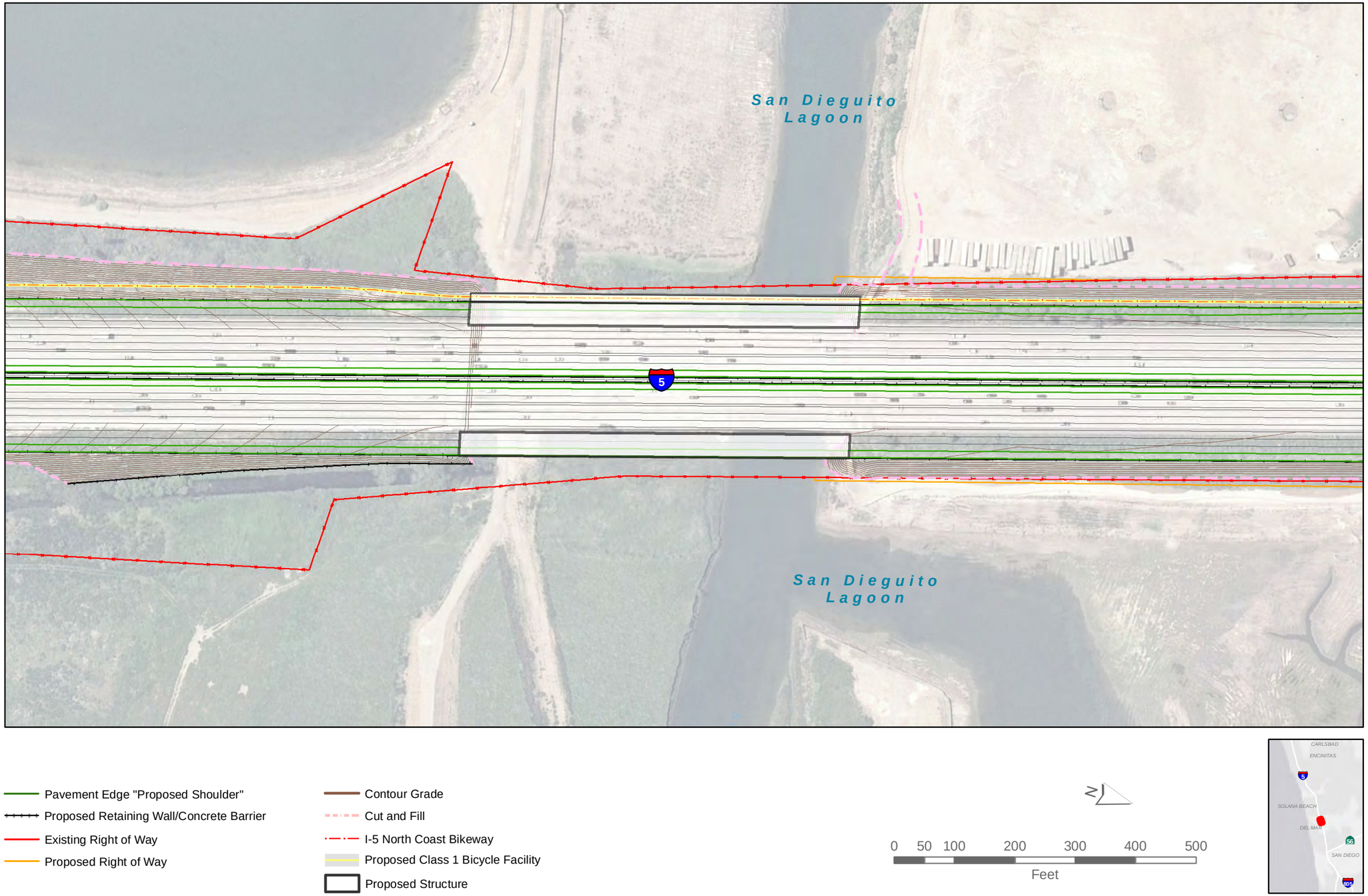
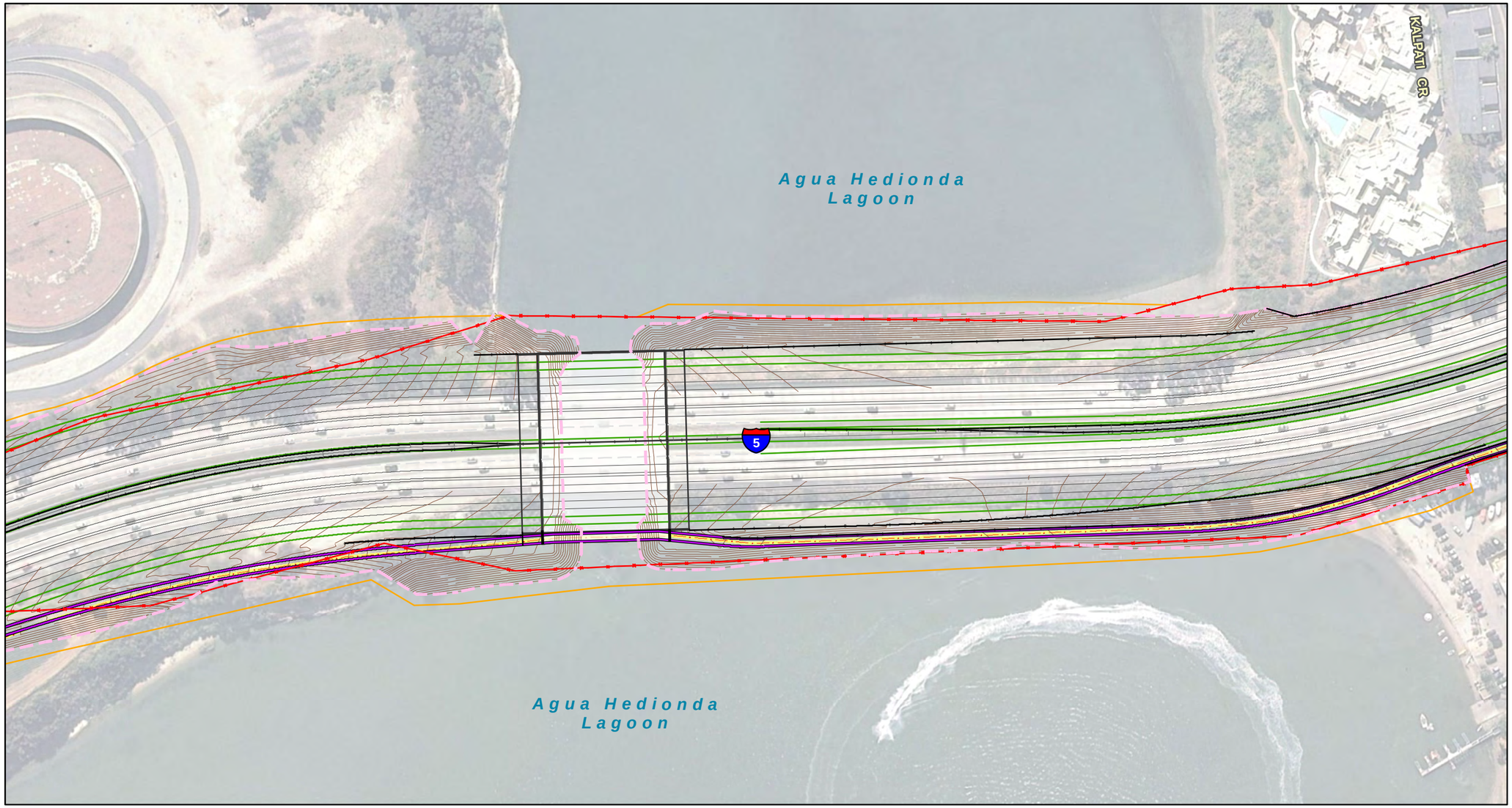


Figure 2-2.10c: 8+4 Buffer Project Features Map: San Dieguito Lagoon



Pavement Edge "Proposed Shoulder"
Proposed Retaining Wall/Concrete Barrier
Existing Right of Way
Proposed Right of Way
Proposed Trail
Contour Grade
Cut and Fill
I-5 North Coast Bikeway
Proposed Class 1 Bicycle Facility
Proposed Structure

N

0 50 100 200 300 400 500
Feet

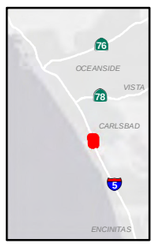


Figure 2-2.10d: 8+4 Buffer Project Features Map: Agua Hedionda Lagoon

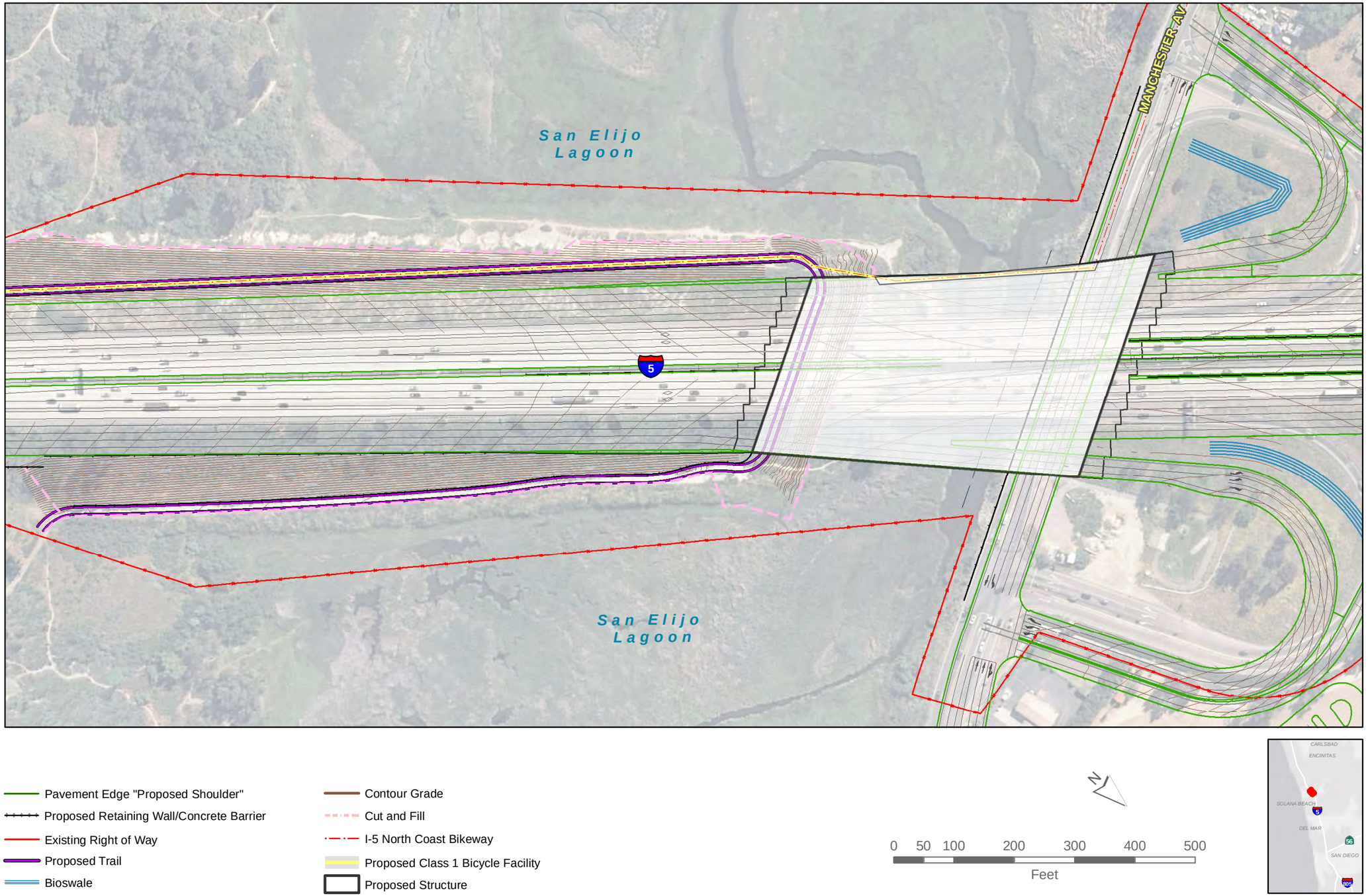


Figure 2-2.10e: 8+4 Buffer Project Features Map: San Elijo Lagoon

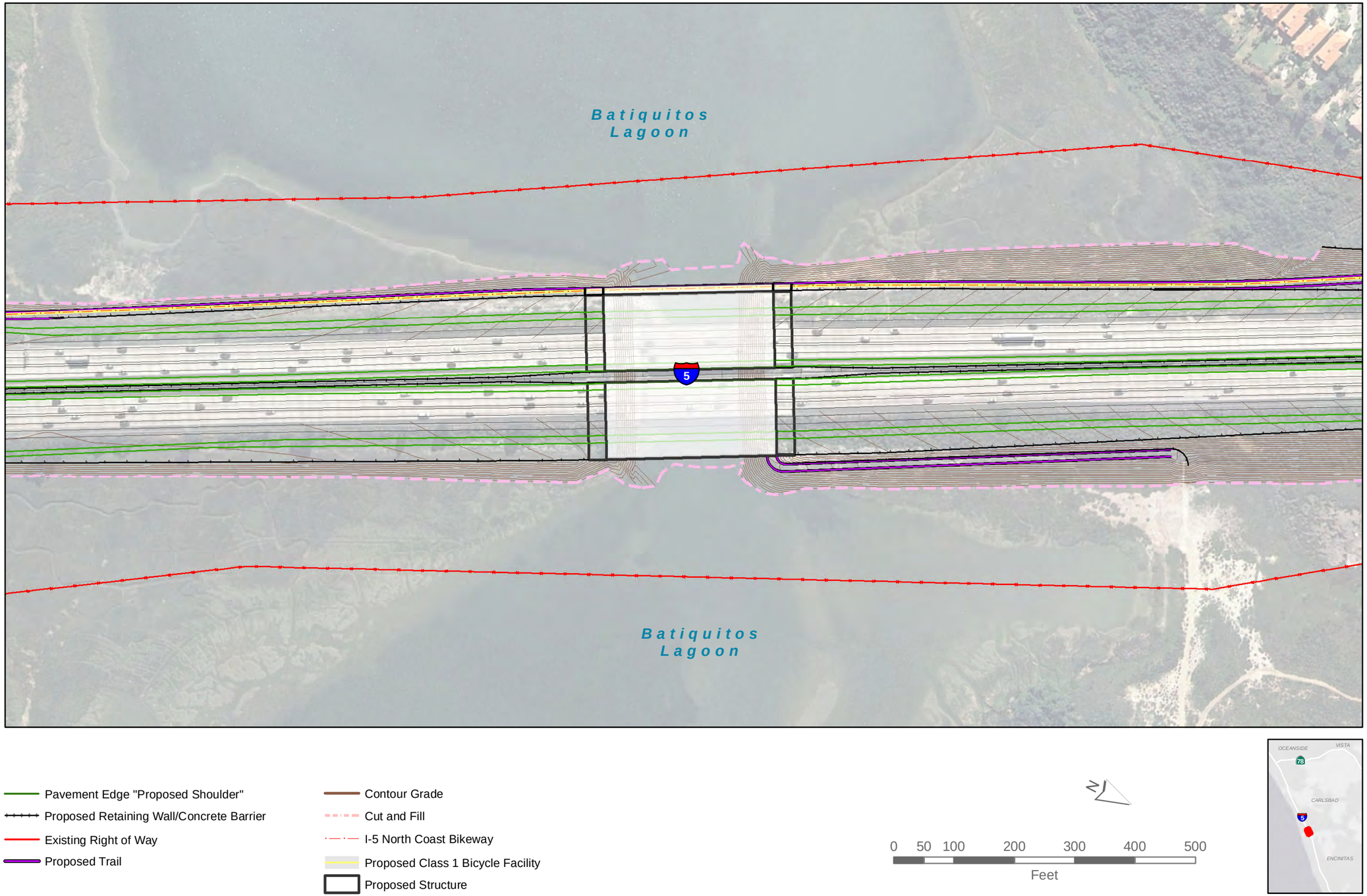
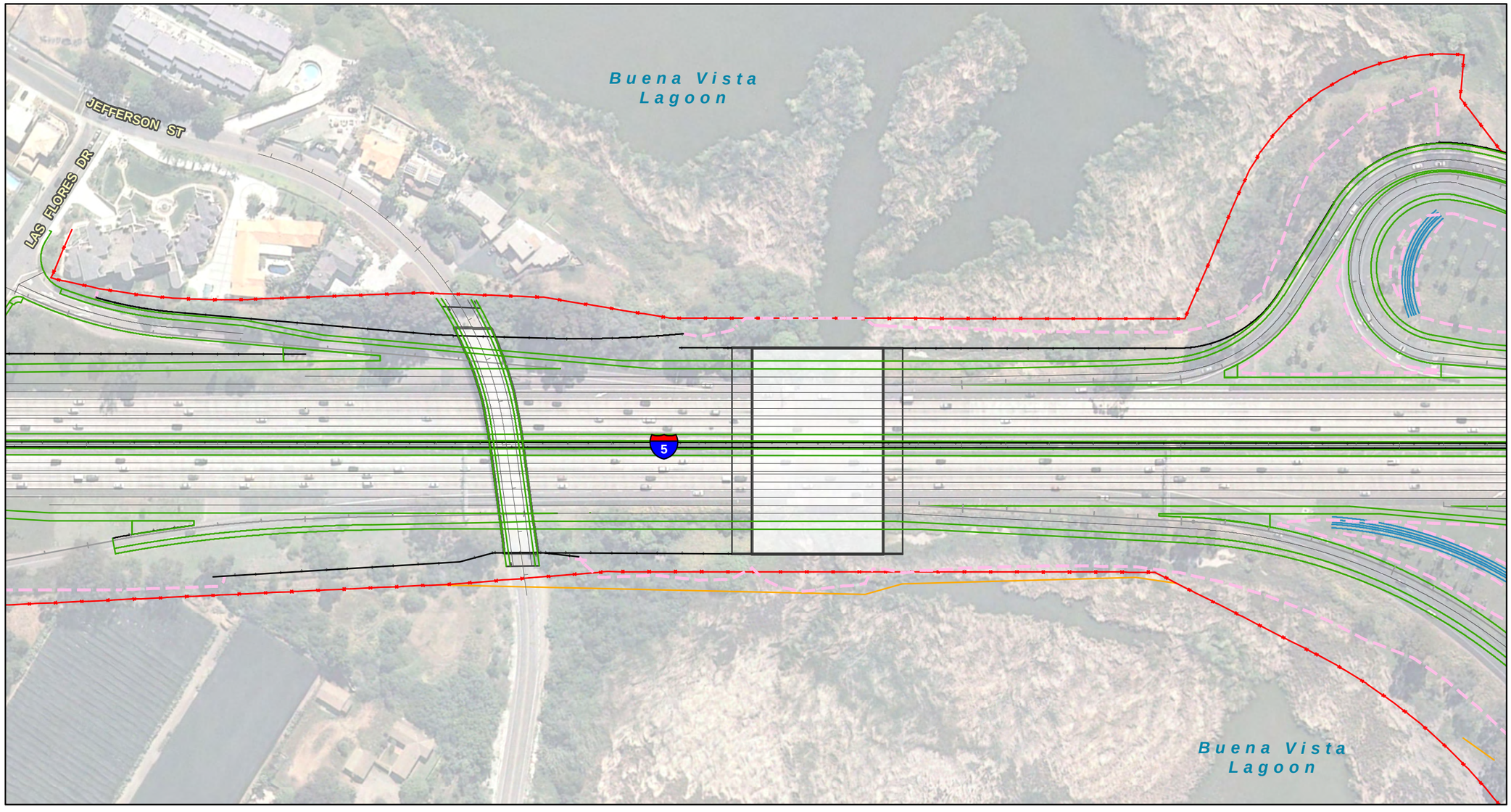


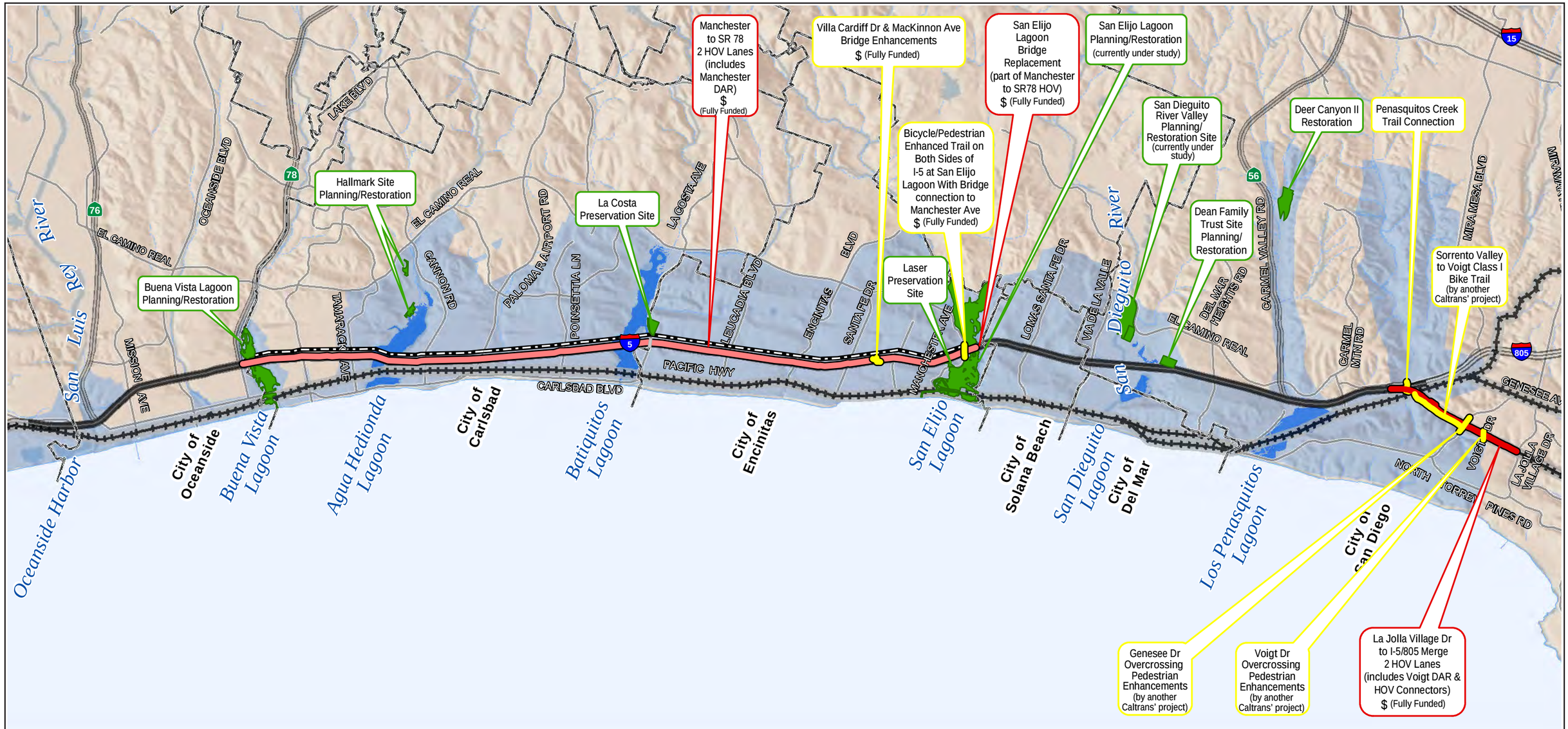
Figure 2-2.10f: 8+4 Buffer Project Features Map: Batiquitos Lagoon



Pavement Edge "Proposed Shoulder"
Proposed Retaining Wall/Concrete Barrier
Existing Right of Way
Bioswale
Contour Grade
Cut and Fill
Proposed Structure

0 50 100 200 300 400 500
Feet

Figure 2-2.10g: 8+4 Buffer Project Features Map: Buena Vista Lagoon



NORTH

DRAFT

NOTE: The Resource Enhancement Program utilizes a pooled approach to creation, restoration, and preservation opportunites for wetland and ESHA resources throughout the corridor.

City Boundary
Interstate
State Route
Major Arterial

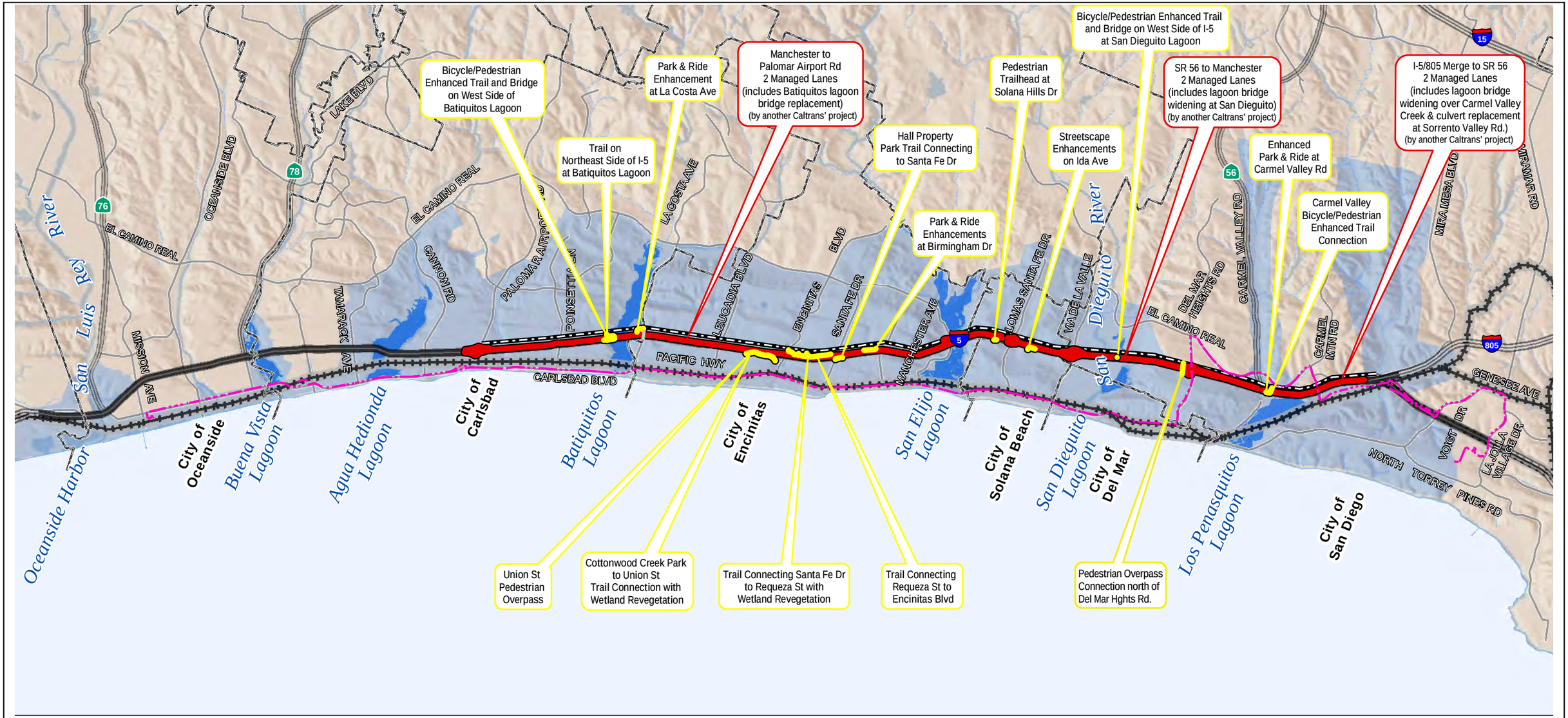
I-5 NCC Project Area
LOSSAN Project Area
I-5 North Coast Bikeway
(Adjacent Segments under Feasibility Study)

Highway Projects
Highway Improvement (initial stage)
Highway Improvement (ultimate)
Proposed Improvement

Community Enhancements
Community Enhancement
Proposed Improvement

Environmental Enhancements
Environmental Enhancem
Proposed Improvement

Figure 2-3.1a: Project Improvements and Enhancements: 2010-2020 Phase



NORTH

DRAFT

NOTE: The Resource Enhancement Program utilizes a pooled approach to creation, restoration, and preservation opportunites for wetland and ESHA resources throughout the corridor.

0 1 2 4 Miles

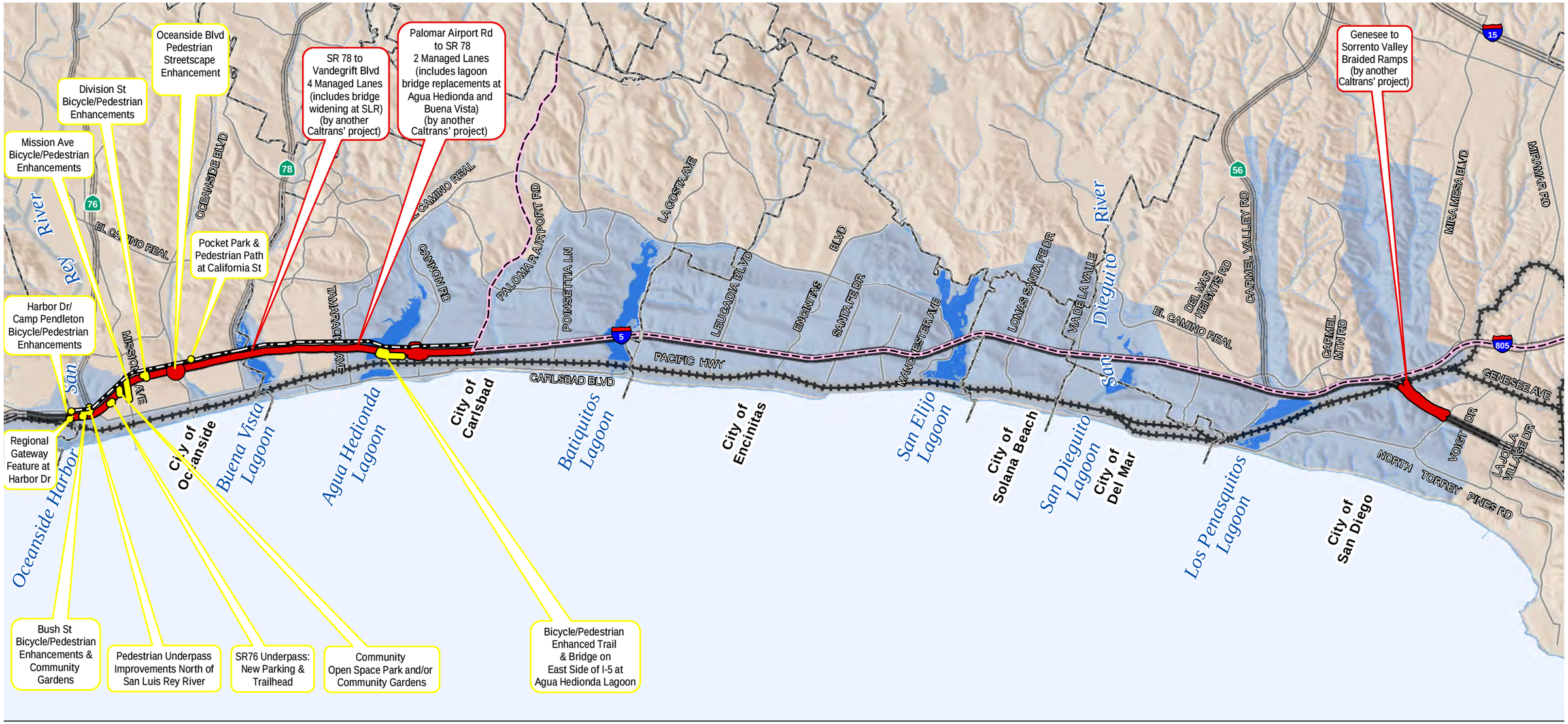
City Boundary
Coastal Zone
Lagoon
Major Arterial

I-5 NCC Project Area
LOSSAN Project Area
Rapid Bus Route
I-5 North Coast Bikeway
(Adjacent Segments under Feasibility Study)

Highway Projects
Highway Improvement
Proposed Improvement

Community Enhancements
Community Enhancement
Proposed Improvement

Figure 2-3.1b: Project Improvements and Enhancements: 2021-2030 Phase



NORTH

DRAFT

NOTE: The Resource Enhancement Program utilizes a pooled approach to creation, restoration, and preservation opportunites for wetland and ESHA resources throughout the corridor.

0 1 2 4 Miles

City Boundary
Coastal Zone
Lagoon
Major Arterial

I-5 NCC Project Area
LOSSAN Project Area
I-5 Reverse Commute BRT
I-5 North Coast Bikeway
(Adjacent Segments under Feasibility Study)

Highway Projects
Highway Improvement
Proposed Improvement

Community Enhancements
Community Enhancement
Proposed Improvement

Figure 2-3.1c: Project Improvements and Enhancements: 2031-2035 Phase

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INTERSTATE 5 CORRIDOR

Chapter 3

Affected Environment, Environmental Consequences, and Avoidance, Minimization and/or Mitigation Measures

CHAPTER 3 – AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

This chapter focuses on updates to *I-5 NCC Project* design for I-5 crossings of the six coastal lagoons in the study area, as described in *Section 3.1* to document the studies completed after the Draft EIR/EIS. Supplemental information is also provided for clarification of sea level rise and water quality (respectively) in *Sections 3.2* and *3.3*. The impacts identified for these issues do not substantially change analysis in the Draft EIR/EIS. This focused supplemental information augments analyses presented in Draft EIR/EIS *Sections: 3.9* (*Hydrology / Drainage [and Floodplains*]), *3.10* (*Water Quality and Storm Water Runoff*), *3.17* (*Natural Communities), 3.18 (Wetlands and Other Waters), 3.20 (Special Animals)*, and *3.21 (Threatened and Endangered Species)*. The information detailed in this chapter will be incorporated into the Final EIR/EIS as modified in response to comments received during public review of this Supplemental Draft EIR/EIS or ongoing engineering refinement.

The following technical studies were prepared in support of this Supplemental Draft EIR/EIS and are incorporated by reference:

- San Elijo Lagoon Bridge Optimization Study, April 2012
- Batiquitos Lagoon Bridge Optimization Study, April 2012
- I-5 Bridge Study at Buena Vista Lagoon, May 2012

Separately bound, they are available for review with this Supplemental Draft EIR/EIS (see www.keepsandiegomoving.com, I-5 Express Lanes Technical Studies).

See Appendix C for a list of the surveys performed.

3.1 SUPPLEMENTAL INFORMATION RELATED TO LAGOONS

The primary purpose of this Supplemental Draft EIR/EIS is to confirm impacts and benefits to the lagoons based on studies completed following circulation of the Draft EIR/EIS. In addition to refining the analysis of lagoon impacts presented in the draft document, the supplemental also clarifies changes that have occurred since circulation of the Draft EIR/EIS; focusing on updates *to I-5 NCC Project* design for I-5 crossings of the coastal lagoons and related waterways in the study area. The six lagoons crossed by the proposed project are individual elements of a regional coastal drainage system. Lagoon water movement (with eastward flow of salty sea water, western flow of fresh water, and ability of the lagoons to accommodate tides and storm events) is individual to each lagoon, but also forms one part of the overall drainage system along this portion of the coast. The “health” of each lagoon is based on the extent to which waters are free flowing or stagnant. This health directly affects the quality of habitat provided for lagoon-dependent wildlife, as well as how well the lagoons function for passive recreational purposes (reflected in health of vegetation, lack of odor, etc.). The sum total of how well these lagoon systems operate also results in regional benefit.

Updated information addresses analysis undertaken to identify optimal bridge lengths and related features, building upon the “Hydrodynamic Approach to Wetland Restoration by optimization of Bridge Waterways” completed by Scripps Institution of Oceanography in October 2010. Existing and proposed bridge dimensions, as well as known environmental concerns are presented; with analysis of potential effects of the modified bridges on tidal circulation, flood flows and associated

scour, sediment transport, sea level rise (SLR) relative to freeboard, wildlife connectivity, channel protection features, and associated impacts on wildlife habitats and federal or State jurisdictional waters/wetlands[1] due to proposed design. Analysis of each lagoon also addresses constraints presented by other primary transportation facilities located west of I-5; including the Pacific Coast Highway 101 (Coast Highway; generally closest to the ocean), and rail road facilities (including the Los Angeles to San Diego [LOSSAN] railroad double tracking project; generally east of Coast Highway).

Proposed project avoidance, minimization, and mitigation/enhancement measures are described. These mitigation and enhancement features (the project Resource Enhancement Program, or REP) comprise a substantial part of the Transportation and Resource Enhancement Program (TREP) presented with the Public Works Plan (PWP), which addresses all impacts and proposed mitigation for the *I-5 NCC Project*, the LOSSAN projects, and local agency projects listed in that document.[2] This program is currently under development in coordination with the resource agencies. Information presented in this chapter details current status of the REP as it focuses on the *I-5 NCC Project*.

Because each lagoon is unique, analyses required to identify potential impacts of the proposed project, as well as appropriate minimization or mitigation of those impacts, also vary by lagoon. The six lagoons from south to north are:

- Los Peñasquitos Lagoon
- San Dieguito Lagoon
- San Elijo Lagoon
- Agua Hedionda Lagoon
- Batiquitos Lagoon
- Buena Vista Lagoon

For Los Peñasquitos, San Dieguito, and Agua Hedionda Lagoons, information regarding lagoon qualities was available based on studies by others and ongoing restoration efforts as described in the San Elijo Restoration Plan and Buena Vista Restoration Plan. This information provides the basis for confirmation of appropriate project design without the need for detailed project optimization studies. For San Elijo, Batiquitos, and Buena Vista Lagoons, supplemental information explains the process for identification of optimal bridge length and design relative to environmental benefits obtained through improvements and accommodating a range of restoration alternatives in the restoration plans for their lagoon.

Two of the six existing lagoon bridges (crossing Carmel Creek at Los Peñasquitos and San Dieguito Lagoons) are relatively new. Necessary transportation improvements proposed under this project would result in minor changes that do not require replacing the existing bridges. The remaining four lagoon bridges would be replaced due to age of the existing bridge and increased width required for the project; including the I-5 crossings at San Elijo, Batiquitos,

[1] Project area waters are regulated by both federal and State agencies. United States Army Corps of Engineers (ACOE) jurisdictional waters of the United States include both wetlands and non-wetland waters of the U.S. State wetlands are regulated by California Department of Fish and Game (CDFG) and the California Coastal Commission (CCC). ACOE wetlands require three criteria to be met: vegetation, soil, and hydrology. CDFG/CCC wetlands are identified based on only one of those criteria.

[2] The PWP/TREP is a separately bound and circulated document used by the CCC for purposes of permitting coastal projects. Compilation of all North Coast Corridor projects into a single mitigation and enhancement effort ensures that the most accurate assessment of total potential impacts is being made and that the best overall options for mitigation of that total effect are being evaluated.

Agua Hedionda, and Buena Vista Lagoons. Studies at Agua Hedionda Lagoon, including review of existing constraints and maintenance, showed no substantial benefit to tidal or fluvial flows resulting from a wider channel; therefore, although the existing bridge represents a constriction, it was determined to be an appropriate length and an optimization technical study was determined to be unnecessary. Bridges at San Elijo, Batiquitos, and Buena Vista Lagoons were identified as potentially posing more substantial constrictions (relative to tidal circulation, flood flow, etc.), with a potential for optimization, and additional technical studies were undertaken to identify how the replacement bridges could be designed to optimize tidal and fluvial flows. In addition, there are plans for large scale restoration efforts at San Elijo and Buena Vista Lagoons (addressed under separate environmental documents). The proposed I-5 crossings at these two lagoons are designed so that they would not restrict the range of restoration alternatives under consideration in the separate environmental documents.

Detailed information for each lagoon and evaluated bridge crossing is provided below. The discussion is organized by groups for which: (1) bridge/channel configuration analysis was based on existing information and hydrodynamic modeling completed during the Phase 2 Study; and (2) focused optimization modeling and analyses were completed. Within each group, lagoons are ordered south to north.

3.1.1 Los Peñasquitos, San Dieguito, and Agua Hedionda Lagoons Optimization Analysis

3.1.1.1 *Los Peñasquitos Lagoon*

Affected Environment

Existing Conditions and Concerns

Los Peñasquitos Lagoon is the southernmost lagoon crossed by the *I-5 NCC Project,* located along the northern edge of the City of San Diego at its border with the City of Del Mar. I-5 crosses waters flowing into the lagoon in three locations: Carmel Creek at the north end of the lagoon, and at Los Peñasquitos and Soledad Creeks southeast of the lagoon (*Figure 3-1.1a*). Due to the distance from the ocean inlet, none of the I-5 crossings is affected by ocean tidal activity in the lagoon.

As depicted on *Figure 3-1.1a*, four major north-south transportation facilities cross Los Peñasquitos Lagoon west of I-5; the Coast Highway (one crossing) and rail lines (three crossings). These facilities result in existing downstream constraints. The Coast Highway bridge (immediately east of the beach at Torrey Pines) was replaced in 2005 to reduce fill and maintain tidal influence to the extent feasible. The new bridge has a design life of 75 years and there are no plans to change it in the foreseeable future. The railroad crossing includes three single-track railroad bridges, which cross both the main channel and a side channel on fill. The California Coastal Commission (CCC) recently approved the replacement of these older wood trestle railroad bridges with in-line concrete bridge structures under federal consistency certification (CC-059-09). Alternative proposals are under consideration for the potential future double tracking of these railroad bridges across the lagoon; including a potential realignment that would remove the rail from the lagoon by tunneling under Del Mar Heights Road and siting it along I-5. Because design and technical studies are scheduled for a future (2041 to 2050) phase, it is unknown at this time which alignment or structures ultimately would be built by the railroad. If feasible, however, removal of some or the entire railroad fill would be likely to enhance both tidal and flood flows between the lagoon and the ocean.

As indicated above, I-5 does not cross the lagoon proper. I-5 does cross Carmel Creek on an existing bridge that is 421 feet long and 179 feet wide. The lagoon is also rimmed by urban uses; including local roadways, parking facilities and residential/commercial development.

In terms of flood flows, existing I-5 crossings at Los Peñasquitos Creek and Soledad Creek can accommodate 100-year flows; the existing I-5 bridge over Carmel Creek and the Sorrento Valley Road culverts through Carmel Creek currently cannot accommodate a 100-year flood event.

With regard to biological issues, Los Peñasquitos Lagoon is a salt marsh system encompassing both freshwater and saltwater flows. It currently suffers from restriction of water flow; i.e., freshwater exiting, and saltwater entering, the lagoon. The constrained flow into and from the ocean has resulted in a higher than normal amount of freshwater being retained in the lagoon. In the past, high salinity conditions have also occurred, when sand deposition from storms cuts off flows between the lagoon and ocean, and evaporation within the lagoon exceeds freshwater runoff into the lagoon. Urban and landscape runoff from upslope surrounding uses also drains into the lagoon, with an associated influx of pollutants.

Based on surveys referenced in the Draft EIR/EIS, sensitive species known from the vicinity (see *Table 3.1.1*) include Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), western snowy plover (*Charadrius alexandrines nivosus;* for which critical habitat is located at the coast line of the lagoon), light-footed clapper rail (*Rallus longirostris levipes*), and coastal California gnatcatcher (*Polioptila californica californica*). There is also potential for the wandering skipper butterfly (*Panoquina errans*) to be present within the lagoon and vicinity. Tidewater goby (*Eucyclogobius newberryi*) are unlikely to occur in Los Peñasquitos Lagoon due to lagoon size, number of lagoon predators, and distance from known populations of this fish. No further evaluation of this fish is provided for this lagoon.

Environmental Consequences

Proposed Improvements

Minimal changes are proposed to the I-5 bridges in the vicinity of Los Peñasquitos Lagoon because the majority of the widening for HOV/Managed Lanes was completed in the 1990s and early 2000s as part of the I-5 / I-805 / SR-56 interchange projects. As a result, the proposed I-5 bridge over Carmel Creek needs to be widened by only 15 feet on the western side of the bridge to accommodate the second southbound HOV/Managed Lane (see *Figure 2-2.10a*; see *Figure 3-1.1b* for length of bridge). Los Peñasquitos Creek and Soledad Creek would be crossed by an HOV/Managed Lanes flyover bridge (3,609 feet long by 60 feet wide) added to I-5 at the I-5 / I-805 merge.

In addition to these I-5 bridges, the old Sorrento Valley Road crossing of Carmel Creek would be replaced. The City of San Diego has closed Sorrento Valley Road to vehicular traffic, and designated it as a bike/pedestrian trail[3]. This existing bike/pedestrian trail would be upgraded and maintained. New bioswales[4] are proposed along this bike path. With regard to storm flow, the existing road has box culverts to convey Carmel Creek in a small portion of the drainage. A

[3] All bike/pedestrian paths would be 12 feet wide or less. While design has not been finalized, co-located bike/pedestrian paths are anticipated to consist of an eight-foot wide paved bike path with an adjacent soft-surface trail for pedestrians.

[4] Bioswales are landscape elements designed to remove silt and pollution from surface runoff water.

new bike/pedestrian crossing would replace these box culverts with a 443-foot long bridge spanning the creek (a length similar to the I-5 bridge across Carmel Creek). The apex of the bike/pedestrian bridge would have approximately 13 feet of clearance, which would be approximately 9 feet higher than existing Sorrento Valley Road (*Figure 3-1.1b*). The preliminary design of the bike bridge assumes 13 rows of three columns each, spaced 30 feet apart on average. The whole area would excavated, including existing stone column supports under the SR-56 ramp west of Sorrento Valley Road. Only the area without stone columns would be considered created wetland. A connection from the Sorrento Valley Road bike path to the new bike/pedestrian trail proposed under I-5 on the southern abutment of the Carmel Creek bridge crossing would ultimately connect to the Carmel Valley and Sea-to-Sea trails. This 10-foot wide connection would include a split rail fence and informational signs to discourage people from leaving the trail.

Wildlife would be free to move under the remaining length of the bridge as well as on the proposed bike/pedestrian trail. The northern abutment under I-5 would be left in its existing condition, with an eight-foot wide bench for wildlife movement. Wildlife currently use a sloped abutment for movement in the vicinity of the I-5 bridges at Carmel Creek. Wildlife would be able to move from the lagoon under the bike/pedestrian bridge and the I-5 bridge and continue up Carmel Creek into the Carmel Valley Resource Enhancement Project (CVREP) area. The northern abutment of the bike bridge would have an eight-foot bench (earthen pathway) that would connect to the bench under I-5.

A bike/pedestrian trail may be added on the southern abutment along Los Peñasquitos Creek to Sorrento Valley Road under all of the existing bridges, including the new HOV/Managed Lanes connector/flyover at Los Peñasquitos Creek (*Figure 3-1.1c*). The southern abutments along this route currently have benches located above the riprap under each of the I-5 bridge crossings. Further study is required, however, to determine whether there is enough area under the I-805 bridges to accommodate this trail. The trail would be designed to avoid impacts to the Los Peñasquitos Creek channel. The northern abutment would be maintained for wildlife movement; no improvements are proposed to the existing slopes and benches between bridges due to constraints presented by the existing I-5 and I-805 bridge abutments.

Biological Resources and Community Enhancements

The minimal widening of the current I-5 bridge (built in 1998) over Carmel Creek (*Figure 3-1.1d*) would result in negligible impacts to wetlands (i.e., ranging from no new impacts to fewer than 100 square feet of new impacts), depending on final design. All support columns for the HOV connector/flyover bridge over Los Peñasquitos and Soledad Creeks (*Figure 3-1.1e*) would be located entirely outside of the creek channels; and no impacts to wetlands, waters of the U.S., or sensitive upland habitats would occur (*Table 3.1.1*). These minimal impacts, plus replacement of the box culverts on Sorrento Valley Road would result in some fill removal and creation of 0.44 acre of waters of the U.S./State wetland, with associated creation of new, partially shaded open water of 0.44 acre (*Figures 3-1.1d and 3-1.1e*).

Although the I-5 bridge over Carmel Creek would not be replaced, improvements to the lagoon/creek system would be feasible, including removal of some of the sediment under the bridge to match sediment elevations in both upstream and downstream areas. The amount of sediment that potentially could be removed would be determined following completion of additional surveys and bridge designs. Any impacts to waters of the U.S./State wetlands would be mitigated using a corridor-wide approach, as described in *Section 3.1.3* of this document).

No federally or State-listed threatened or endangered species have been identified within the I-5 construction footprint at Los Peñasquitos Lagoon. Coastal California gnatcatcher were not observed within the vicinity during protocol surveys, and no western snowy plover nesting areas or foraging habitat are present in the project impact footprint or vicinity. No direct impacts to these species are anticipated. Belding's savannah sparrow and light-footed clapper rail occur in the lagoon west of the I-5 / SR-56 interchange; however, no wetlands would be permanently impacted and minimal construction would occur in the vicinity. All known clapper rail and Belding's savannah sparrow locations are over 1000 feet from the proposed Sorrento Valley Road bike bridge. Clapper rail have also been identified upstream of I-805 on Los Peñasquitos Creek; however, the proposed project would not impact the creek and known locations are approximately 480 feet from the anticipated work (as well as being on the east side of northbound I-5 and I-805 from the work to be done). No effects to light-footed clapper rail are anticipated. In addition, while it is not a federally or State-listed threatened or endangered species, there is some potential for the wandering skipper butterfly to occur at Los Peñasquitos Lagoon.

As noted, there also would be a connection from the trail proposed under I-5 to the trail in the CVREP, which would enhance wildlife movement opportunities in the area. With this trail connection, wildlife would be able to move from the lagoon, under the bike/pedestrian bridge, and continue under the I-5 bridge into the CVREP. The 10-foot wide bench encompassing the proposed bike/pedestrian trail on the southern abutment of the Carmel Creek bridge would not result in any impacts to existing wetlands or other sensitive resources. The northern abutment under I-5 would be left in its existing condition, with an eight-foot wide bench for wildlife movement. No new indirect impacts to habitats or wildlife are anticipated.

There is a potential for noise/vibration impacts to bird species as a result of pile driving during bridge footing construction. Wandering skipper surveys are also required. The reader is referred to *Section 3.1.3* of this document for discussion of measures identified to address these potential noise/vibration and sensitive species impacts. Given the existence of existing transportation facilities, and the minimal nature of changes in operations following project implementation, and the lack of identified sensitive species locations; potential indirect impacts to sensitive species resulting from increased lighting, exposure to invasive species, edge effects, long-term increases in noise, etc. are expected to be negligible.

Hydrology/Hydraulics

As noted, the existing I-5 bridge over Carmel Creek and Sorrento Valley Road culverts associated with Carmel Creek currently cannot accommodate a 100-year flood event (i.e., the 100-year flood would not freely pass under the bridge). "Freeboard" is the area between the height of the flood flow and the bottom of the bridge, or soffit. Following completion of I-5 widening across Carmel Creek and replacement of the culverts under Sorrento Valley Road with a bike/pedestrian bridge, the main lanes of I-5 would continue to have a flood flow deficiency of approximately 0.7 foot of freeboard at the Carmel Creek I-5 bridge crossing. Removal of the culverts under Sorrento Valley Road and construction of the elevated bike/pedestrian bridge would improve existing conditions and accommodate 100-year flood flows, while also removing some of the existing flow constraint responsible for the current freeboard deficiencies at the Carmel Creek I-5 bridge crossing. The new bike/pedestrian bridge would be expected to have a freeboard of 3.2 feet during a 100-year flood event (*Table 3.1.1*).

Currently, tidal flow does not reach the I-5 bridge over Carmel Creek. If future sea level rise allows for tidal flows to extend upstream to the bridge, it would be minimal and Caltrans could implement adaptation strategies to ensure continued access across Carmel Creek during a

100-year flood event. These strategies could include removing additional sediment from under the bridge, replacing the bridge, and/or other feasible design strategies available at that time. A deficiency of 0.7 foot of freeboard would not result in flooding all lanes of the freeway at this crossing even if all of the conservative assumptions in the FEMA model occurred. Rather, this 0.7 foot freeboard deficiency represents a temporary build up of water east of I-5, with freeway access anticipated to be maintained.

Based on the height of the proposed flyover bridge at Soledad and Los Peñasquitos Creeks, freeboard would be anticipated to range from 28.5 to 35.1 feet during a 100-year flood (*Table 3.1.1*). Assuming a reduction in projected freeboard for a 100-year flood event combined with a 'high' (55-inch or approximately 4.5-foot) projection of SLR estimated for Year 2100, would still result in 24 to 30.6 feet of freeboard. While some of the columns supporting the bridge over Soledad Creek would be in the floodplain, they would not be in the creek channel itself. The potential impacts associated with the exacerbating effects of SLR on channel erosion, storm surge and flooding would be further minimized through the existing location and design of the bridge support structures, and their distance from the ocean, which reduces concern regarding impacts due to wave action, tidal inundation and/or flooding.

Appropriate Bridge and Optimized Channel

The existing I-5 bridges are upstream of effects associated with existing tidal circulation, erosion, and scour. One-hundred year surface flows are constricted. The existing bridge length functions during normal conditions, however, and periods for which "back up" could occur under 100-year storm events combined with high SLR, are considered to be of short duration and can be accommodated. Existing design is functional and the bridges are appropriate lengths for Los Peñasquitos Lagoon.

3.1.1.2 *San Dieguito Lagoon*

Affected Environment

Existing Conditions and Concerns

San Dieguito Lagoon is located at the mouth of the San Dieguito River, in the City of Del Mar. Several north-south transportation facilities cross the San Dieguito River Valley and lagoon system, resulting in constriction points on flood flows and sediment transport. From west to east, these facilities include the Coast Highway, railroad bridge, Jimmy Durante Boulevard Bridge, and finally the I-5 bridge (*Figure 3-1.2a*). The Los Angeles to San Diego (LOSSAN) project plans to double-track and replace the railroad bridge across San Dieguito Lagoon in the 2021 to 2030 time period. Plans currently are preliminary, however, and detailed technical information for the proposed crossing is under development. Coast Highway and Jimmy Durante Boulevard are not proposed for any expansion and/or reconstruction at this time. These two downstream facilities would continue to result in constraints on tidal range within the lagoon.

The existing I-5 bridge that crosses San Dieguito Lagoon is approximately 650 feet long and 179 feet wide, with approximately 140 feet of the total span occurring over the flowing river channel bottom (*Table 3.1.2*). The depth of the main channel is -4.0 feet National Geodetic Vertical Datum of 1929 (NGVD; a datum system used to measure elevation [altitude] above and below mean sea level [MSL]). The remainder of the bridge span is located outside of the active channel and is open to flood flows. The wide expanse south of the channel and beneath the bridge (approximately 400 feet) is used by wildlife moving up- and downstream.

The north bank of the San Dieguito River channel is protected by riprap and supports a paved trail located on the northern I-5 bridge abutment; the south bank of the main channel does not have any riprap. The southern abutment of the San Dieguito Bridge is armored with riprap. An existing pedestrian/equestrian trail along the north bank of the river is located within the San Dieguito River Park and is part of the Coast to Crest Trail. This trail is fenced and has signs directing people to stay on the trail.

A large San Dieguito Lagoon restoration project, the Southern California Edison (SCE) San Onofre Nuclear Generating Station (SONGS) project, is underway. SONGS restoration began in 2006, with the goal to restore approximately 115 acres of tidal wetland, as well as to develop native upland habitat and bird nesting areas within the lagoon. In addition, the lagoon inlet was opened and SCE will continue to dredge the inlet to keep it open permanently.[5]

The SONGS restoration project was modeled and planned to accommodate the existing I-5 bridge span and channel dimensions. An important component of the restoration involved keeping flows within the channel at a level sufficient to transport sand to the beach in Del Mar (with the SONGS project required to maintain a condition of no decrease in downstream sand transport). The SONGS restoration project also is expected to increase the tidal "prism" (the difference between tide-related high and low water levels) of the lagoon by up to 13 percent.[6] The associated identification of maximum tidal range is the difference between the lowest and highest observed water level. Specifically, the greater the range, the lower the effects of "tidal muting" within the lagoon system. More complete drainage associated with greater variation in water levels also improves tidal "flushing," or exchange between the ocean and lagoon/riverine areas; resulting in improved water quality as indicated by higher dissolved oxygen and reduced areas of nutrient concentrations.

Urban and landscape runoff from upslope and surrounding uses also drain into the lagoon, with an associated influx of pollutants. Of particular concern are the discharge of sediment and related siltation effects, which can adversely impact water quality (and have related potential effects on eelgrass, which is not currently present).

Based on surveys referenced in the Draft EIR/EIS, sensitive plant and animal species with potential to occur at San Dieguito Lagoon include eelgrass (*Zostera marina*), Belding's savannah sparrow, light-footed clapper rail, western snowy plover (with associated proposed critical habitat), California least terns (*Sterna antillarum browni*), and coastal California gnatcatchers (*Table 3.1.2*). There is also potential for presence of wandering skipper butterflies at the lagoon. Tidewater goby are unlikely to occur in the San Dieguito lagoon due to high flows in the river channel, distance from the mouth of the estuary, and the large number of predators within the lagoon. In addition, monitoring of fish populations associated with the SONGS mitigation has not identified any tidewater goby. Therefore, no further evaluation of this fish is provided for this lagoon.

With regard to the large area available under the existing bridge on the south side, it is noted that existing support walls produce a tunnel-like effect, which may discourage some wildlife from using this area.

[5] The SCE project was granted 35 acres of mitigation credit due to environmental benefits associated with keeping the mouth of the estuary open.

[6] Greater ranges between high and low water levels, indicate lower levels of tidal "muting," or the amount to which levees or other man-made features restrict the exchange of water between the wetland and the ocean.

Environmental Consequences

Proposed Improvements

The *I-5 NCC Project* proposes to maintain the existing auxiliary lanes across the lagoon and widen the existing San Dieguito Lagoon bridge to accommodate an 8+4 Buffer configuration (the LPA[7]) rather than replace the bridge. Bridge width would be expanded from 179 to 258 feet; an increase of 79 feet (see *Figure 2-2.10c*; see *Figure 3-1.2b* for bridge length). A short retaining wall would be placed on the east side of I-5 south of the San Dieguito River to avoid encroachment into a wetland at the base of the I-5 slope.

A new bike/pedestrian path is proposed on the western freeway slopes across San Dieguito Lagoon. This would cross the lagoon in an area where no crossing currently exists, and would provide a possible connection to the Coast to Crest Trail. The bike/pedestrian path would be cut into a large fill slope south of the river. Where actually crossing the lagoon, the bike/pedestrian path would be suspended from the existing I-5 bridge (refer to *Figure 2-2.4*). The bike/pedestrian path would be constructed with a short retaining wall or fill in some areas north of the San Dieguito River.

Biological Resources and Community Enhancements

Impacts resulting from the freeway bridge widening improvements would be limited to open water and salt marsh habitat. Currently, there is no eelgrass habitat near the I-5 bridge crossing (although this habitat could potentially extend upstream as a result of the SONGS restoration project dredging to keep the lagoon inlet open and the associated changes in hydrology). Eelgrass surveys would be completed prior to construction of the bridge (see *Section 3.1.3*).

The widening of the I-5 bridge would result in an additional 2.99 acres of permanent impacts to ACOE jurisdictional waters of the U.S. and 3.59 acres of State wetlands as a result of additional road bed fill and columns required to support the widened freeway span (*Figure 3-1.2c*). The existing bridge shades approximately 0.75 acre of waters of the U.S./open water. The proposed bridge widening would result in shading of an additional 0.42 acre of waters of the U.S. and 0.75 acre State wetland. Impacts to waters of the U.S./State wetlands would be addressed as stated in *Section 3.1.3*.

Saltmarsh habitat that potentially supports the State-listed endangered Belding's savannah sparrow and coastal sage scrub that supports federally listed threatened coastal California gnatcatcher would be impacted by widening of I-5 at San Dieguito Lagoon (*Figure 3-1.2c*). Although Belding's savannah sparrow occurs in the adjacent SONGS salt marsh habitat, none have been observed in the project impact footprint. Similarly, least tern and western snowy plover nesting areas are nearby I-5 but not within the anticipated impact footprint. Light-footed clapper rail were not observed within the project impact footprint or vicinity during protocol surveys. Portions of territories associated with four pairs of coastal California gnatcatcher and one single male may be impacted due to construction of wider fill slopes. The wandering skipper butterfly uses salt grass (*Distichlis spicata*) as a host plant and can also be found in adjacent habitats such as coastal sage scrub. Accordingly, there is a potential for this species (wandering skipper butterfly) to occur at San Dieguito Lagoon and to be directly impacted by the proposed project; with associated measures to address such potential impacts provided in *Section 3.1.3* of this document.

[7] The FHWA has not identified an LPA under NEPA.

Indirect impacts to sensitive species can result from increased lighting, increased exposure to invasive species, edge effects, and increased potential for pollution from runoff, as well as long-term increases in noise. I-5 is currently 10 lanes in width across the lagoon, and as such, nighttime lighting, increased access from invasive species, and habitat bisection that could result in edge effects have already occurred. The remainder of the corridor has experienced increased development that has further encroached on native habitats at the lagoon. The potential build alternatives would result in incremental increases to indirect effects already occurring. Indirect effects such as increased dust, lighting, invasive species, and noise would be minimized through the conservation measures identified in the Draft EIR/EIS and this document (see *Section 3.1.3*). Specifically, this may include measures such as the use of: standard dust control measures during construction (e.g., watering and equipment speed/access restrictions); directional lighting; and/or native species for landscaping/revegetation efforts.

With respect to potential project operational noise, under existing conditions, noise in excess of 70 dBA occurs over various amounts of wetland and upland habitats that either support, or have the potential to support, special status bird species at coastal lagoons in the North Coast Corridor. Although population numbers have undergone natural fluctuations over the years, these species continue to forage, nest, breed, and otherwise consistently occur within suitable habitat during the breeding season in areas subjected to a wide range of noise levels. Specifically at San Dieguito Lagoon, long-term noise studies identified the loudest existing noise level at 66 dBA L_{eq}, with a predicted future noise level at the same location of 68 dBA L_{eq}, indicating an anticipated increase of two dBA. This two dBA increase was predicted at three noise sampling locations, with similar increases of two to three dBA likely across the entire open lagoon area. Within the project vicinity, three species are specifically known; California least tern, Belding's savannah sparrow, and coastal California gnatcatcher. A majority of the documented locations of the Belding's savannah sparrows east of I-5 (6 of the total 10 locations) and coastal California gnatcatcher west of I-5 (8 of the total 11 locations), occur within the existing 66 dBA L_{eq} noise contour. The Belding's savannah sparrow population west of I-5 occurs in between the existing 56 and 62 dBA L_{eq} contours, and is not subject to the relatively higher noise levels on the eastern side. This is due primarily to the distribution of suitable habitat and naturally sound-attenuating geographic features of the landscape. Regardless, the predicted relative noise increase for these individuals west of I-5 is also approximately two dBA.

As noted, a bike/pedestrian path is proposed on the western freeway slopes across San Dieguito Lagoon. The slopes south of the San Dieguito River Bridge are relatively large and do not have wetlands at the base; therefore, the bike/pedestrian path would be cut into a large fill slope in this area. North of the San Dieguito River, the right-of-way is very limited and the earthen channel drainage that flows from Via de la Valle to the river would be routed into a pipe for the majority of the length due to roadbed fill. A small portion of the fill would be a result of the bike/pedestrian path, rather than the freeway. An additional 0.36 acre and 0.5 acre of ACOE (included in the impact totals) jurisdictional waters of the U.S. and waters of the State would be impacted, respectively. The bike/pedestrian path would be located toward the top of the slope. The slopes of the San Dieguito watershed are generally higher than other lagoons, and the bike/pedestrian path would be located as far from sensitive habitats as feasible. The bike/pedestrian path would be fenced and signed to keep users on the trail and no turn outs would be provided for users to stop beside the lagoon. Although a new facility, indirect impacts from bicycle movement and proximity of people to the marsh are anticipated to be minimal due to the upslope location and the lack of opportunities to leave or stop along the trail.

The large area south of the channel that is under the existing bridge has over 400 feet available for wildlife movement, although the existing bridge is supported by bent wall bridge supports

that can produce a "tunnel effect." The widened portion of the bridge also would be placed on bent walls for structural stability. Caltrans is reviewing the possibility of cutting holes into the existing, as well as the widened, support walls to allow light to pass through, thereby creating a more open feel.

Adjacent to the east side of I-5 as it crosses the San Dieguito River Valley is the City of San Diego W6 Site. Owned by the City Wastewater Department, this approximately 14-acre site is reserved for City mitigation needs. Wetland habitat east of and along the base of the I-5 slope would be wholly avoided through use of the short retaining wall noted in Project Improvements. As a result, no impacts to the wetland would occur and the connection to the river would remain intact.

Caltrans is requiring SCE to place culverts within their proposed permanent access road under I-5 that would connect and drain this wetland to the river.

Hydrology/Hydraulics

The proposed I-5 bridge widening would not constrict the SONGS-improved tidal prism as the existing long bridge span was modeled for the restoration and widening the structure would not change its effect on tidal flow. Existing downstream structures at Jimmy Durante Boulevard and Coast Highway, however, would continue to constrain the channel and the tidal flow east to the I-5 bridge and beyond. Modifications to the proposed I-5 bridge would not achieve additional tidal enhancement as a result of these downstream constraints. The proposed I-5 bridge complies with the SONGS condition regarding sedimentation in that it would not result in a decrease in downstream sediment transport.

The 100-year flood event for the proposed I-5 bridge over San Dieguito River was modeled pursuant to FEMA requirements. FEMA requires a worst case scenario analysis, with the 100-year flood combined with the highest spring tides and storm wave run-up occurring within a channel that is not scoured. Based on this analysis, the proposed bridge would have only 0.7 feet of freeboard at its lowest bridge elevation (*Table 3.1.2*). Additional focused hydraulic studies were conducted as part of the Phase 2 lagoon studies, incorporating the SONGS restoration project and a restoration project at location W19, and assuming channel scour (Chang 2011). This more "real world" model predicted six feet of freeboard being maintained during 100-year flood flows for the proposed bridge. Combining that more realistic freeboard assumption of six feet with a conservative estimate of area available to pass a 100-year flood occurring during a projected "high" SLR scenario (4.5 feet by year 2100) would result in adequate freeboard of 1.5 feet being available. The potential for SLR to exacerbate the effects of tidal flows and associated channel erosion, storm surge and flooding on the I-5 bridge support structures would be minimized due to location and design of these support structures. They are not expected to be subject to wave action, tidal inundation and flooding due to the distance from the ocean and available flood-flow freeboard.

Modeling conducted to date for the proposed widened I-5 bridge and upstream mitigation (San Dieguito Lagoon W19 Restoration Project Feasibility Study 2011) did not identify any associated increase in flow velocity under the bridge. Accordingly, armoring the south bank is not anticipated to be necessary. Review of the bridge found that scour of the bridge footings could potentially occur to a maximum depth of -5.2 NGVD during a 100-year flood. This is well above the footings required for the bridge and would not damage the bridge. The bridge is presently built to allow for scour around the columns, and therefore, armoring would only be placed along the abutments by the freeway slopes.

Appropriate Bridge and Optimized Channel

The existing distance between the I-5 bridge and the San Dieguito River/Lagoon opening to the ocean, combined with the existing length of the I-5 bridge structure (and associated accommodation of flood flows, wildlife movement, etc.) support the conclusion that the current I-5 crossing is at appropriate length. Specifically, any increase in bridge length would result in only minimal benefits relative to the associated additional cost. Project improvements would therefore not require any new or expanded shoreline protection and would not adversely affect the implementation and success of the ongoing SCE SONGS restoration project.

3.1.1.3 *Agua Hedionda Lagoon*

Affected Environment

Existing Conditions and Concerns

Agua Hedionda Lagoon is a relatively deep, open water system with three basins (west, central, and east), located in the City of Carlsbad (*Figure 3-1.3a*). The lagoon is crossed by three transportation facilities that control water flow through the lagoon. The inlet to the lagoon flows under the Coast Highway and is stabilized by fixed jetty structures that maintain an open inlet to the lagoon. The next crossing upstream is the railroad crossing, with construction ongoing for double tracking of the railroad in this location (Federal Consistency Certification CC-075-09). The approved LOSSAN double tracking project will result in a second rail bridge that is 213 feet long and 22 feet wide, supported on four columns based on four-foot concrete pilings. I-5 is the easternmost crossing of the lagoon, upstream of the railroad bridge. The existing I-5 bridge at Agua Hedionda Lagoon is 191 feet long, and 157.5 feet wide, with four rows of 32 one-foot diameter columns (*Figure 3-1.3b*). Riprap protection at the I-5 crossing occurs throughout the channel and abutment slopes.

Recreational uses are allowed in two of the three basins (central and east), and the Encina Power Plant and planned Poseidon Desalination Plant are located adjacent to the west basin. The intake of the power plant, located in the west basin, has been determined to have an “iron lung effect” on the lagoon (i.e., it artificially forces water flow from east to west), resulting in effective draining of the eastern basin. The Encina Power Plant also regularly dredges the lagoon every two years to maintain a clear inlet to the ocean. The Poseidon Desalination Plant plans to continue similar maintenance dredging and will use the lagoon water intake for their operations (Coastal Development Permit E-06-013).

The open water areas at Agua Hedionda Lagoon support eelgrass habitat, although there is minimal fringing wetland habitat adjacent to open water areas and no fringing marsh habitat is present near I-5; only intertidal sandy bottom occurs in these locations. The existing steep slopes north of the Agua Hedionda I-5 bridge are eroded and support non-native vegetation.

There are no existing trails at the lagoon, but there is a marina and recreational boating is allowed, including power boats. There is an existing high level of use of this lagoon by boats, jet skis, paddlers, etc. There is little or no upland or wetland habitat, except open water, on the east side of the lagoon.

Based on surveys referenced in the Draft EIR/EIS, sensitive bird species with potential to occur at Agua Hedionda Lagoon include Belding’s savannah sparrow, light-footed clapper rail, and coastal California gnatcatcher (*Table 3.1.3*); however, no point locations in close proximity to I-5

have been recorded for these species at the lagoon due to lack of appropriate habitat near I-5. There is no appropriate habitat for wandering skipper near Agua Hedionda Lagoon; therefore, this species is assumed absent from the area. Section 3.21 of the Draft EIR/EIS noted that: (1) tidewater goby had been observed there in the past, and (2) Agua Hedionda lagoon contained the greatest potential for the fish in the study area. Based on additional review of the current depth and open nature of the lagoon and large number of predators in the lagoon, however, this species is now considered unlikely to occur.

Environmental Consequences

Proposed Improvements

The proposed bridge would retain the 191-foot length, but would be approximately 269 feet wide with auxiliary lanes in both directions, an increase of 111.5 feet over the existing structure (*Figure 3-1.3b*). The new bridge would be similar in design to the existing I-5 bridge designs at San Elijo and Batiquitos Lagoons (*Figures 3-1.4b* and *3-1.5b*, respectively, below). Specifically, it would have two rows of 16 four-foot diameter columns (cast-in-place drilled hole footings). Fewer columns would also result in less obstruction in the channel, and therefore, lower potential to slow flow through the bridge. The proposed bridge would have a channel bottom width of 76 feet, equal to the existing bridge cross section, with 2:1 channel slopes (*Table 3.1.3*).

A 16-foot-wide bench for wildlife crossing would be placed on both the northern and southern abutments; and a north/south bike/pedestrian path across the lagoon is proposed on the eastern side of I-5 (see *Figure 2-2.10d*; see *Figure 3-1.3b* for bridge length). A short retaining wall (six feet or lower) would be constructed on the roadbed fill for the proposed bike/pedestrian path, thereby avoiding an increase to project footprint requirements. The bike/pedestrian path would be fenced and signed to direct users to remain on the path and would not provide turn-outs that could encourage stopping beside the lagoon. No pets would be allowed on the bike/pedestrian. Educational signs regarding the sensitivity of lagoon resources could also be added.

Biological Resources and Community Enhancements

Permanent project-related impacts to Agua Hedionda Lagoon from replacement and widening of the bridge would be associated with additional roadbed fill for widening the freeway, removal of existing columns and replacement with new columns, and placement of riprap on the abutments. Impacted habitats would consist primarily of open water and mudflat, with some eelgrass beds also affected. Specifically, the project would permanently impact approximately 3.56 acres of ACOE jurisdictional waters of the U.S. and 3.77 acres of State jurisdiction wetland (*Figure 3-1.3c*). Calculations for temporary impacts for access and staging during construction would be determined as design proceeds. An additional 0.37 acre of shaded waters of the U.S. (i.e., beyond those shaded by the existing bridge) would occur with the widened replacement bridge.

There are no known federally or State-listed threatened or endangered species within the I-5 construction footprint or proximity at Agua Hedionda Lagoon; therefore, associated direct impacts are not anticipated. Eelgrass impacts are anticipated and surveys would be conducted prior to, during and after I-5 construction, as described below in *Section 3.1.3*.

Indirect impacts to habitats and sensitive species can result from increased lighting, increased exposure to invasive species, edge effects, and increased potential for pollution from runoff (including sediment/siltation), and long-term increases in noise. Similar to the other lagoons, project noise modeling indicates a projected I-5-related noise increase of approximately

two dBA over a majority of the lagoon, with some portions of the lagoon subject to an increase of up to three dBA. No known sightings of any of the special status bird species addressed in this study have occurred at Agua Hedionda Lagoon, however, and indirect impacts to these species are not expected. In addition, I-5 is currently eight lanes in width across the lagoon, and combined with surrounding urban development, results in an existing condition that includes night lighting, invasive species, bisection of habitats, and generation/discharge of urban pollutants. As such, a build alternative would result in only incremental increases to indirect effects already occurring to the minimal native habitat near the lagoon. Indirect effects such as increased dust, lighting, invasive species, and noise would be minimized through the conservation measures identified in the Draft EIR/EIS and *Section 3.1.3* of this document. There is also a potential for construction-related noise impacts to both bird and fish species from pile driving during bridge footing construction at the abutments (the foundation upon which the bridge rests). The reader is referred to *Section 3.1.3*, below.

With regard to the proposed north/south bike/pedestrian path on the east side of Agua Hedionda Lagoon, some coastal sage scrub is located downslope from the proposed bike/pedestrian path on the southeastern slope. No direct impacts to this area are anticipated. A short retaining wall would allow for bike/pedestrian path construction without additional impacts to the waters of the U.S./State wetland. While the proposed bike/pedestrian path could increase public use in this area, no associated indirect impacts are anticipated based on existing high levels of human use of the area by boaters, jet skiers, paddlers, and the like, as well as the general absence of sensitive habitats and species.

Hydrology/Hydraulics

Tidal circulation in the east basin of Agua Hedionda (including the maximum area of tidal inundation) was examined during studies comparing a number of bridge options (see *Table 3.1.3*). The bridge studies also included an assessment of alternative I-5 channel and bridge designs utilizing flow fence technology (armoring features that funnel water for more hydraulic efficiency). Due to agency comments and concerns about the feasibility and local application of the technology, however, flow fence concepts are no longer under consideration.

<u>Additional Design Considerations for Lagoon Crossing Alternatives</u>

Hydraulic studies of tidal and fluvial flows through the I-5 bridge were completed for the proposed design and several bridge alternative options (Phase 2 studies; UCSD et al. 2010). *Table 3.1.3* contains alternative options specifics and costs differentials. Each of the designs would include a number of project elements described above; including completion of the ongoing LOSSAN improvements, wildlife benches, and new connections for the Carlsbad Rail Trail system.

The bridge options were proposed to optimize water exchange on either side of I-5 and increase tidal inundation in the wetlands east of I-5. Each alternative was developed to reduce tidal muting east of I-5 in order to enhance wetland habitat and water quality. Three alternative options were proposed for Agua Hedionda: the double length bridge span alternative, the Chang Channel bridge alternative, and the fill removal alternative (*Table 3.1.3*).

The double length bridge span proposes a doubled channel bottom width of 152 feet, crossed by a bridge 267 feet long and 267 feet wide. This bridge would cost $6.6 million more than the proposed I-5 bridge. The Chang Channel bridge proposes a wider bottom channel (128 feet in

width) with steeper sides at a 1:1 grade supported by concrete. This bridge would cost $5.8 million more than the proposed I-5 bridge.

As previously described for the San Dieguito Lagoon, the maximum tidal range is the difference between the lowest and highest observed water levels, with a higher range representing reduced tidal muting effects (and vice versa). Accordingly, a higher tidal range and corresponding lower muting would also indicate more complete drainage of the East Basin during low tide. These conditions would improve tidal flushing (i.e., the exchange between the ocean and lagoon areas), resulting in improved water quality as indicated by higher dissolved oxygen and reduced areas of nutrient concentrations. Tidal and fluvial modeling of the proposed bridge structure at I-5 and alternate bridge configurations showed minimal change to tidal muting and related effects, as summarized on *Table 3.1.3*. Specifically, if the power plant were to discontinue operations, and the desalination plant were either not implemented or discontinued operations in the future, the I-5 crossing would not provide the primary constriction point in the lagoon.

Based on the noted analyses of tidal circulation, the proposed I-5 bridge design (191 feet in length and 269 feet in width, with a proposed channel bottom width of 76 feet) would result in an additional 1.1 acres of tidal inundation over the existing condition. The double length bridge span would result in 2.3 acres additional intertidal area and loss of a corresponding amount of subtidal habitat, both in the eastern basin. The noted 2.3 acres would represent an increase of 1.2 acres over the proposed project, corresponding with 1.2 acres of additional inundated area. The Chang Channel bridge would result in 1.3 acres of additional inundated area (0.2 acre more than the proposed project) with a corresponding decrease of intertidal habitat in the eastern basin.

Although there would be some decrease in the maximum flood currents due to wider and deeper channel with this project design, future currents would still exceed the minimum velocities required to mobilize beach sand (0.6 feet/second). Although flood currents through the bridge structures would be sufficient to mobilize sand, slower moving eddies in the basins would not be fast enough to transport fine sand and sediment, and localized shoaling (sand deposits) would result.

Based on the previously described “iron lung effect” from the power plant, a longer I-5 bridge would not appreciably increase water quality, decrease tidal muting, or result in increased wetland habitat. In addition, alternative bridge designs were shown to have a negligible effect on fluvial sedimentation and sediment transport within the system and shoreline sand supply.

Based on the FEMA 100-year flood calculations, the bridge would have at least 6.4 feet of freeboard at the Agua Hedionda Lagoon crossing assuming a high spring tide and storm wave run-up. According to the hydraulic and scour studies by Chang for the Phase 2 studies (UCSD et al. 2010), the proposed bridge would not change flood elevations, and 100-year flood events would continue to be contained within the existing floodplain boundary. That is, the tidal cycle would not change the height of the 100-year flood at I-5 due to the higher water surface elevations during the flood, as well as the distance of I-5 from the ocean. The previously described projected “high” SLR of 4.5 feet by 2100 would correspondingly increase the 100-year flood elevation at I-5; however, at least 1.9 feet of freeboard would remain at the new I-5 bridge under this scenario.

Appropriate Bridge and Optimized Channel

The lack of substantial difference in benefits provided by the I-5 lagoon crossing alternatives discussed above in this section, together with the substantial increases in costs associated with those alternatives, supports identification of the proposed project as the appropriate bridge.

Specifically, due to the fixed inlet and railroad bridge cross sections, an increase in the I-5 cross section would provide little ecological benefit to the lagoon for the associated cost. The results of the Phase 2 studies (UCSD et al. 2010) summarized above and on *Table 3.1.3* indicate that a longer bridge or deeper channel would not appreciably change tidal muting, erosion and scour, floodplain effects, or water quality in the lagoon. Although a crossing alternative with a longer bridge, and a channel that is twice as wide as the existing crossing of 152 feet, would result in fewer impacts to waters of the U.S./State (approximately 0.7 acre less) from roadbed fill, the potential benefits do not correlate with the additional bridge costs of $6.6 million (see *Table 3.1.3*).

3.1.2 San Elijo, Batiquitos, and Buena Vista Lagoons

3.1.2.1 *San Elijo Lagoon*

Affected Environment

Existing Conditions

San Elijo Lagoon is a coastal wetland located at the northern extent of the City of Solana Beach that contains significant biological and ecological resources. Three basins in the lagoon are divided by existing transportation facility crossings. Furthest west is the ocean inlet that flows under Coast Highway and through a narrow sinuous channel into the western basin. The channel then flows under the railroad crossing into the central basin. The main channel flows primarily along the northern edge of the Central Basin and then under I-5 into the eastern basin (*Figure 3-1.4a*). San Elijo Lagoon contains primarily coastal salt marsh and mud flat west of I-5, and coastal brackish marsh and freshwater marsh east of I-5.

The existing bridge at San Elijo (*Figure 3-1.4b*) is 340 feet long and 157.5 feet wide (consisting of separated north- and southbound lanes). The existing channel bottom width is 130 feet wide, with a channel depth of -6.0 feet NGVD and 1:1 slopes supported by riprap. There is an existing hiking trail at San Elijo Lagoon that is not fenced on the lagoon side of the trail (with the trail also used for maintenance access to a sewer pump station). Under I-5, the trail is an unpermitted eroded track with a wooden “bridge” that is not maintained. This existing trail experiences high use rates, with people often using a track at the edge of the marsh west of I-5 as a secondary trail.

Concurrent with the *I-5 NCC Project*, the San Elijo Lagoon Restoration Project (SELRP) is in the planning stage, with the objective of restoring the lagoon’s functions and habitat values to the extent feasible, given the constraints presented by surrounding existing/current development. The overarching goal of the SELRP is to protect, restore, and maintain, via adaptive management, the San Elijo Lagoon ecosystem. Four options are under consideration for the SELRP (described below under Environmental Consequences, Hydrology/Hydraulics).

Based on surveys referenced in the Draft EIR/EIS and updated information from the CDFG, light-footed clapper rail have been detected in the cattails east of I-5, as well as in one location

west of the I-5 bridge (*Figure 3-1.4c*). Belding's savannah sparrows have been identified in the pickleweed (*Salicornia* spp.) west of and adjacent to I-5. Coastal California gnatcatchers have been observed on the fill slopes on both sides of I-5, and critical habitat for this species is located at the lagoon. Critical habitat for snowy plover is located in the eastern basin, approximately 400 feet east of I-5. Wandering skipper butterfly have also been identified on the western I-5 slopes.

Environmental Consequences

Proposed Improvements

The I-5 bridge over San Elijo Lagoon is proposed to be 603.1 feet long (*Table 3.1.4*). Construction of the new bridge would require a width of 288 to 353.6 feet to accommodate the construction area (*Figure 3-1.4b*). The bridge width would vary due to the widening required for the on- and off-ramps to Manchester Avenue. A 261-foot channel bottom width is proposed, pursuant to the optimization analysis described below under Hydrology/ Hydraulics.

Wildlife and pedestrian movement was considered for both northern and southern abutment areas. Because the I-5 bridge extends over Manchester Avenue on the north, the existing intervening traffic and physical constraints eliminate the possibility for the northern abutment to accommodate a wildlife corridor. A 12-foot-wide bench to facilitate wildlife movement would be provided on the I-5 southern abutment, below a proposed 12-foot-wide fenced pedestrian path. The wildlife bench would be physically separated from the pedestrian path and located at a lower elevation (closer to the channel water line; see *Figure 2-2.10e*). See *Figure 3-1.4b* for bridge length. In addition to the pedestrian path on the southern abutment and along the eastern fill slopes (similar to existing conditions), a proposed bike/pedestrian path connection would be provided on the western side of I-5 from Lomas Santa Fe to Manchester Avenue. The connection would be on a secondary bridge suspended from the I-5 structure (*Figure 2-2.4*).

Biological Resources and Community Enhancements

Proposed I-5 bridge construction across San Elijo Lagoon with a 261-foot channel bottom width would result in creation of 1.1 acres of new wetland. The project would require placement of 0.60 acre of additional roadbed fill within ACOE jurisdictional waters of the U.S. and 1.01 acres of additional fill within State wetlands (*Figure 3-1.4c*). The net result would be creation of 0.50 acre of ACOE jurisdictional waters of the U.S. and 0.09 acre of State wetlands. In addition, the project would result in additional shading impacts to 1.79 acres of waters of the U.S. and State wetlands due to the wider and longer span of the bridge over the existing and newly created wetland (*Table 3.1.4*). Construction of the longer optimized bridge would also allow for a wider range of restoration alternatives for SELRP (although specific benefits of the longer bridge on lagoon habitats would be dependent on the restoration alternative selected).

If the existing 130-foot channel width were retained, bridge construction would result in net permanent impacts to 0.63 and 0.99 acre of waters of the U.S. and State wetlands, respectively (*Table 3.1.4*).

I-5 improvements would result in impacts to portions of four coastal California gnatcatcher territories, as well as habitat used by wandering skipper butterfly (*Figure 3-1.4c*). The permanent area of effect would not impact Belding's savannah sparrow or light-footed clapper rail habitat. Temporary impact areas and construction noise, however, may have an adverse effect on these two species. Construction noise impacts to wildlife (including both fish and bird

species) in San Elijo Lagoon also may occur due to the need for pile driving during bridge falsework construction. Impacts to species and habitats would be mitigated as discussed in *Section 3.1.3* of this document.

Connections to the suspended section of the bike/pedestrian path would occur within area already disturbed for bridge improvements. A 6-foot high retaining wall would support a 12-foot wide bike/pedestrian path within the same slope footprint, without an increase in direct impacts. All paths would be fenced and signed to keep pedestrians on the improved areas and out of the sensitive lagoon habitats and wildlife corridors. The new bike/pedestrian path connections would be designed to prevent bicycle access (using bollards or a U-shaped design) to the pedestrian trails that directly access the ecological reserve.

As noted elsewhere in this section, indirect impacts to sensitive species can result from increased lighting, increased exposure to invasive species, edge effects, and increased potential for pollution from runoff, as well as long-term increases in noise. The presence of the existing 10-lane freeway, and development near the lagoon, have resulted in an existing condition that includes nighttime lighting, the presence of invasive species, and bisection of habitats being part of the existing condition. Incremental increases to these existing indirect effects would occur if a build alternative is approved. Specifically with regard to noise, long-term operational noise analysis was presented in the Draft EIR/EIS and supporting Natural Environment Study (Caltrans 2009). Ambient noise levels measured in varying locations at San Elijo Lagoon were between 60 and 67 dBA. Future noise level increases during the noisiest hour at most receptor points are projected to be one to three dBA, with an increase in traffic-related noise over the entire lagoon of approximately two dBA. Noise at Receptor 5 in San Elijo Lagoon would decrease by one dBA due to the widening of I-5 closer to intervening topography, and would result in roadway noise being somewhat attenuated or deflected by an abutting steep slope. This increase in overall noise may have an adverse effect on some wildlife species. As described elsewhere in this chapter, however, it should be noted that although population numbers have undergone natural fluctuations over the years, species have continued to consistently forage, nest, and breed, within suitable habitat in areas subjected to a wide range of noise levels (including noise in excess of 70 dBA). Indirect effects such as increased dust, lighting, invasive species, pollutant discharge, and noise would be minimized through the conservation measures identified in the Draft EIR/EIS and *Section 3.1.3* of this document.

Although the proposed pedestrian crossing from Manchester Avenue would be likely to increase use of the San Elijo Lagoon trails, as noted above, the new bike/pedestrian and pedestrian paths would be fenced and signed to minimize off-path activity. No pets would be allowed on bike/pedestrian paths. Due to the bike/pedestrian paths being fenced, as well as maintained in accordance with a formal maintenance agreement with the City of Solana Beach, increased indirect impacts to the lagoon are not expected. In the vicinity of the lagoon, the bike/pedestrian path would be placed closer to I-5 to minimize indirect effects to sensitive saltmarsh species. This section of the bike/pedestrian path would be a through route across the lagoon without access to existing pedestrian-only trails in the lagoon and no turn outs would be provided for users to stop beside the lagoon. Indirect impacts resulting from the proposed pedestrian paths and bike/pedestrian path are therefore also likely to be low.

Hydrology/Hydraulics

Additional Design Considerations for Lagoon Crossing Alternatives

As noted above, the SELRP is evaluating scenarios to restore the San Elijo Lagoon functions and habitat values to the extent feasible. Four options are under consideration for the SELRP, each of which was evaluated in an optimization technical study completed for the lagoon (San Elijo Lagoon Bridge Optimization Study 2012) and are discussed below:

- **No Project** Alternative proposes no grading within the lagoon except for maintenance dredging of the inlet channel.

- **Alternative 1A** would result in minimal physical changes to the lagoon, with the exception of enlarging the main feeder channel throughout and redirecting its course just west of I-5. This design option, which could be implemented with a bridge 370 feet in length, would cost $26.8 million, which is considered the baseline bridge cost.

- **Alternative 1B** would result in a more substantial change to the existing lagoon to create a greater diversity of habitats while maintaining the existing lagoon inlet. A new subtidal basin off the main channel would be created in the central basin. The channel in the eastern basin would be significantly enlarged to promote more tidal exchange east of I-5. This design option, which could be implemented with a bridge 603.1 feet in length, would cost $16.1 million more to implement than baseline bridge costs.

- **Alternative 2A** would result in changes to the existing lagoon to create a greater diversity of habitats than presently exists. Seawater would enter the lagoon via a new tidal inlet located south of the existing inlet and a new subtidal basin would be created just landward of the new inlet in the western and central basins. The channel in the eastern basin would be significantly enlarged to promote more tidal exchange east of I-5 (identical to Alternative 1B). This design option, which could be implemented with a bridge 603.1 feet in length, also would cost $16.1 million more to implement than baseline bridge costs.

Optimization Analysis

The Draft EIR/EIS for the *I-5 NCC Project* stated that regardless of the I-5 build alternative selected, if the project is approved, ultimate bridge dimensions would include the channel dimensions for the lagoon restoration option selected for the SELRP. At the time the Draft EIR/EIS was released for public review, however, the bridge length over the channel was not confirmed, and impacts were therefore based on widening the freeway while maintaining the existing bridge length. The currently proposed I-5 bridge in this area has undergone further design, including design to accommodate the 261-foot optimized channel width identified for restoration Alternatives 1B and 2A.

Should the No Project or Alternative 1A be implemented from the SELRP, it is important to note that the existing channel dimension beneath the I-5 bridge would be the optimized channel. This conclusion in the optimization technical study is based on the fact that the existing lagoon inlet and the associated channel between Coast Highway and the railroad bridge represent the primary constrictions for tidal and flood flows, and these features would not be modified for the No Project or Alternative 1A. Accordingly, increasing the I-5 bridge channel dimension would

not effectively improve tidal or flood flow conditions for these alternatives. The existing I-5 bridge channel also helps to reduce flooding on Manchester Avenue in the central basin, by attenuating peak flows in the eastern basin (which results in higher flood levels in the eastern basin, but little or no flooding in the central basin). Therefore, if the I-5 existing bridge channel were widened under the No Project or Alternative 1A scenarios, substantial flooding along Manchester Avenue would occur in both the eastern and central basins.

Tidal and fluvial hydraulic modeling also analyzed a range of channel widths under each bridge structure crossing the lagoon to identify which would provide the optimum feasible tidal and fluvial flows. These analyses are presented in the San Elijo Lagoon Bridge Optimization Study (2012). The selection of optimum channel widths was based on a sensitivity analysis conducted for each bridge crossing under typical dry weather tidal fluctuations and extreme storm conditions (100-year storm and 100-year plus SLR combined water levels). Tidal range was used as the primary indicator for benefits to the wetland ecosystem, and extreme flood elevations were modeled to evaluate the potential for flooding of Manchester Avenue. Using these indicators, optimal bridge lengths were identified; i.e., lengths at which tidal range and flood conveyance were most favorable, and further increase in bridge length would bring only minimal benefit. *Table 3.1.5* presents the optimum channel widths for each bridge under each SELRP alternative.

Table 3.1.5
SUMMARY OF SAN ELIJO LAGOON OPTIMIZED CHANNEL DIMENSIONS FOR EACH SELRP ALTERNATIVE (in feet)

Alternative	Hwy 101 Bridge		Railroad Bridge		I-5 Bridge	
	Bottom Width	Channel Invert (NGVD)	Bottom Width	Channel Invert (NGVD)	Bottom Width	Channel Invert (NGVD)
No Project	105	-4	161	-5.5	130	-6
1A	115	-4	161	-5.5	130	-6
1B	130	-4	161	-5.5	261	-6
2A	200	-6.5	590	-15.0	261	-6.5

Upon completion of the optimization technical study, the I-5 bridge was designed to accommodate the optimal 261-foot channel bottom associated with SELRP lagoon restoration Alternatives 1B and 2A, as well as other features under consideration such as bike/pedestrian paths and wildlife crossings as discussed in the preceding section (*Figure 3-1.4b*).

The tidal and fluvial benefits of the proposed structures would be dependent on the SELRP restoration alternative selected. For the No Project and Alternatives 1A and 1B, the tidal and fluvial flows would be primarily dependent on the existing inlet and associated sinuous channel in the western basin that regulates the flows into and out of the lagoon (i.e., the previously described channel between the Coast Highway and railroad bridges). The maximum tidal ranges at I-5 with the optimized I-5 channel dimensions specified in the table above would be between 5.06 and 5.43 feet for No Project and Alternative 1A. The maximum tidal ranges at I-5 with the 261 foot channel under I-5 would be 4.66 and 8.06 feet for Alternatives 1B and 2A, respectively (*Table 3.1.4*). The tidal range would be lower for Alternative 1B because the larger

volume of water accommodated following dredging would not be able to fully drain from the lagoon before the next high tide. Residence time is the average time a particle resides in a hydraulic system; it provides a useful measure of the rate at which waters in the hydraulic system are renewed. Accordingly, residence time provides a means for assessing the water quality of the hydraulic system. Specifically, a shorter residence time means that sediment passes through the lagoon more quickly; indicating better circulation, more water exchange, less sediment deposition, and therefore better water quality within the lagoon. The No Project lagoon design would not provide enough volume of tidal waters east of I-5, so no residence time was determined. Alternative 1A would result in a 12.7 day residence time in the eastern basin. Alternatives 1B and 2A show a much quicker turn over, with 7.5 and 4.5 days residence time, respectively (*Table 3.1.4*).

As noted, fluvial flows during storm events are also an important consideration for optimization analyses. Several portions of Manchester Avenue which border the northern side of the lagoon are currently within the 100-year floodplain. With the No Project Alternative or Alternatives 1A and 1B, flows would be constrained through the existing inlet, and the related downstream channel between the Coast Highway and railroad bridges would continue to be constrained. The lengthened I-5 bridge with an optimized channel bottom width of 261 feet for Alternative 1B would result in the majority of Manchester Avenue being removed from the floodplain (with the exception of small areas in the eastern and central basins, refer to *Section 3.1.4*). As indicated in the study, however, further expansion of the I-5 channel width to 392 feet under the Alternative 1B scenario would not result in a demonstrable difference in the flooded area. Alternative 2A is the only scenario that would remove all of Manchester Avenue from the 100-year floodplain, by combining the optimized 261-foot wide channel bottom width with a slightly deeper channel invert than Alternative 1B, and creation of a new lagoon inlet and associated railroad bridge.

Sediment transport within the lagoon is related to the flow velocity of water therein. During dry periods, flow velocity and sediment movement are dependent on tidal flows, while during storms, sedimentation is related to flood velocities. As anticipated, the results demonstrating effective sediment transport vary depending on the alternative. Tidal flow velocities would be lower at I-5 with the No Project Alternative, due to minimal tidal volume. Tidal flow velocities for Alternatives 1A and 1B at I-5 would only be slightly higher than for the No Project Alternative, although the greater volume of water movement and optimized channel at the inlet and railroad crossing under these scenarios would allow the channels to scour and reduce deposition, thereby maintaining the channel cross sections for a longer period. Flow velocities and the ability to carry sediment would be highest at I-5 for Alternative 2A, due to the increased volume and the new inlet and railroad bridges.

During peak storm flows, modeling indicated that sediment would be carried through the main channels to the mouth of the lagoon for all alternatives. Flow velocities would decrease more quickly away from the channels in Alternatives 1A and the No Project, however, due to a smaller volume of water and narrower channels.

A 55-inch SLR in year 2100 also was modeled with the 100-year flood storm condition to determine flow velocities and amount of freeboard available to pass flows at each of the bridges. For all alternatives, the 100-year flood height would increase by approximately two feet. The velocities were shown to actually decrease because the channels would be deeper, thereby providing for a greater cross section to accommodate the flow. The Coast Highway bridge would have the least amount of available freeboard, with only approximately 0.4 to 0.8 feet with the noted SLR. The railroad bridge in its current location would have over 6 feet of

freeboard, while the new railroad bridge location under SELRP Alternative 2A would have approximately 7.9 feet of freeboard. The I-5 bridge would have between 19.5 to 21.1 feet of freeboard depending on the SELRP restoration alternative selected, and therefore would accommodate SLR.

Appropriate Bridge and Optimized Channel

The optimized I-5 bridge would extend 603.1 feet over San Elijo Lagoon and would encompass a channel bottom width of 265 feet. The proposed bridge length is slightly longer than recommended as a result of the Bridge Length Optimization Study and is included here as an enhancement component. Along with implementation of the other features of SELRP Alternatives 1B or 2A, this optimized I-5 bridge would result in increased tidal range and fluvial flow characteristics, with associated benefits for lagoon habitats, residence time, water quality, and flood control, at a cost of $42.9 million.

3.1.2.2 *Batiquitos Lagoon*

Affected Environment

Existing Conditions and Environmental Concerns

Batiquitos Lagoon is comprised of approximately 600 acres within a watershed that includes San Marcos and Encinitas Creeks and is located at the very southern extent of the City of Carlsbad. Three transportation corridors cross the basins of Batiquitos Lagoon (*Figure 3-1.5a*). The Coast Highway (with separated north- and southbound lanes) crosses over new inlet jetties and provides the western edge of the western basin. The railroad crossing separates the west and central basin. I-5 is the easternmost crossing of the lagoon. The basin located between the railroad and I-5 is known as the central basin, with the largest (east) basin east of I-5. These crossings and the development around the lagoon are constraints to the lagoon's hydraulic flows and potential expansion.

The existing I-5 facility is divided into north and southbound bridges, each of which is approximately 68 feet wide (with a gap in between) and approximately 219 feet long (*Figure 3-1.5b*). Current channel design features include a bottom width of 66 feet at the bottom with 4:1 slopes to edges of the abutment (approximately 106 feet between abutments), a shoaled depth of -5.3 feet NGVD[8], and a 2:1 slope at the abutments covered with riprap (*Table 3.1.6*).

A large-scale restoration project was completed by the Los Angeles Port District in Batiquitos Lagoon in 1997. A new inlet was constructed concurrent with a new Coast Highway bridge, and stabilized with jetties. The lagoon was dredged and several nesting islands for least terns were constructed. The restoration project placed riprap at a depth of -7.0 feet NGVD throughout the entire I-5 channel. Additional dredging occurs periodically to maintain tidal flow.

Currently, the floodwaters backup in the eastern basin behind the I-5 bridge, with a smaller backup noted in the central basin, and the largest backup in the western basin between the inlet and the railroad bridge. Tidal velocity during the dry season varies depending on the condition of the lagoon at the time, and whether it is dredged or shoaled. Regular maintenance of the lagoon mouth is needed to dredge sediment that accumulates primarily in the western and

[8] The existing channel is lined with riprap at -7.0 feet, but has filled with sediment to a current depth of -5.3 feet for the channel bottom.

central basins. Tidal velocity at I-5 currently is 4.3 feet per second at flood tide and 3.9 feet per second at the ebb tide.

Habitats within or in the vicinity of Batiquitos Lagoon primarily include open water that supports eelgrass; with mud flats, coastal salt marsh, brackish emergent marsh, riparian, and coastal sage scrub habitats at its perimeter. The large, open-water lagoon provides important habitat for fish, waterfowl, and shorebirds; including special-status wildlife species. The slopes of the lagoon are also important wildlife corridors for both large and small mammals.

Five listed species are known to occur at Batiquitos Lagoon in the vicinity of I-5 (*Figure 3-1.5c*). Based on surveys referenced in the Draft EIR/EIS and updated in 2011 and 2012, three pairs of threatened coastal California gnatcatchers were identified on the south-facing northern slopes of Batiquitos Lagoon. One pair was identified on the fill slope on the northwestern side of I-5. Federal and State-listed light-footed clapper rail have been identified in the vicinity of I-5 to the northwest, north and southeast. State-listed Belding's savannah sparrows have been observed on the eastern side of I-5. In addition, there is a large nesting area easterly of I-5 that is used by both the endangered California least tern and the western snowy plover.

Tidewater goby are unlikely to occur in Batiquitos Lagoon due to high flows in the river channel, distance from the mouth of the estuary, and the large number of predators within the lagoon. Monitoring of fish populations following the 1997 completion of the lagoon restoration project has not identified any tidewater goby; nonetheless, the U.S. Fish and Wildlife Service (USFWS) has recommended surveys be completed at the lagoon. Tidewater goby surveys would be completed within appropriate habitat within the biological survey area (within a 500 feet radius of I-5) in 2012. Eelgrass also has been identified close to I-5.

There is an existing unpermitted trail along the northeastern side of Batiquitos Lagoon, across the wetland from the Gabbiano Lane cul-de-sac, with an unpermitted bridge over an inundated area east of I-5 and north of the lagoon open water. Use of this unpermitted trail along the edge of the marsh has resulted in trampling of existing vegetation. Although the use of this trail is categorized as "regular" as opposed to "high" volume, use has resulted in erosion and impacts to the wetland/native upland vegetation.

Environmental Consequences

Proposed Improvements

The I-5 bridge over Batiquitos Lagoon is proposed to be 282 feet long, broken into north- and southbound bridges each 122 feet wide, with a 19.2-foot gap between them (*Table 3.1.6*). The channel bottom would be 183.5 feet wide, with a depth of -7 NGVD. The new channel would be a trapezoid with a level bottom between the abutments. The dimensions of the bottom would result in the same overall cross section as the optimized bridge with the same modeled dimensions at -1.0 foot elevation (NGVD). The existing riprap within the channel bottom would be removed.

The new I-5 bridge configuration would be similar to the existing bridge (i.e., two bridge structures with a gap separating the north- and southbound lanes; see *Figure 2-2.10f;* see *Figure 3-1.5b* for bridge length). New abutments would be built with 16-foot benches (for wildlife movement on the southern abutment, and for use as a pedestrian path and a wildlife corridor on the northern abutment). This bench on the southern abutment would be located at an elevation a few feet above the high tide line to allow for wildlife to travel along the edge of the channel.

This northern abutment pedestrian path/wildlife corridor could be fenced with a split rail fence for both wildlife and pedestrian use or divided with a fence to separate a 10-foot wide pedestrian path from 6 feet used by wildlife. Due to limitations in clearance, the northern abutment bench cannot be split into two levels to provide for wildlife movement wholly separated from pedestrians. The slopes of the channel would be armored with riprap due to the higher tidal velocities and fluvial flows anticipated through the channel. The pedestrian path would continue from under the bridge on the northern abutment to the eastern and western slopes of the freeway surrounding the lagoon.

The trail location proposed in the Draft EIR/EIS (to the south across the channel and connecting to the La Costa park and ride) has been eliminated due to potential impacts to sensitive species in the lagoon and associated least tern nesting area. The La Costa Park and Ride would be upgraded within the existing footprint of the Park and Ride (restriping/paving) with improvements to the California Department of Fish and Game's (CDFG's) driveway for dredge access. A new bike/pedestrian path is proposed that would cross the lagoon on the western side of the I-5 bridge. A short retaining wall would allow for construction without additional impacts to the waters of the U.S./State wetland. The bike/pedestrian paths would be fenced and signed to keep pedestrians and bicycles on the improved area and out of the surrounding sensitive habitat. Bicycles would not be allowed along the pedestrian paths to the east.

Biological Resources and Community Enhancements

Widening of I-5 and replacement of the bridge would result in permanent project-related impacts at Batiquitos Lagoon to native habitats (including 3.13 to 4.32 acres of ACOE jurisdictional habitat and 3.58 to 4.8 acres of State wetland[9], shading of an additional 0.44 to 0.56 acre of open water) as well as to sensitive species (*Figure 3-1.5c*). As stated above, eelgrass is located in proximity to I-5, and could be impacted. One pair of federal and State-listed light-footed clapper rail has been identified within the permanent impact footprint northeast of I-5. One additional pair has been identified in the temporary impact area. Portions of four territories of California gnatcatcher using existing cut slopes of I-5 also would be impacted. Portions of the habitat of at least one pair and one individual of Belding's savannah sparrow would be permanently impacted by the project. Nesting areas used by California least tern and western snowy plover; are approximately 250 feet east of the project impact area. There would be no direct permanent impacts to these species; however, there would be potential noise impacts during construction. Impacts to species and habitats would be mitigated as discussed in *Section 3.1.3* of this document.

Indirect impacts to sensitive species could result from increased lighting, increased exposure to invasive species, edge effects, and increased potential for pollution from runoff, as well as long-term increases in noise. The documented special status species locations for Batiquitos Lagoon are all relatively close to the I-5 corridor and are located within or adjacent to the existing 66 dBA L_{eq} noise contour. The future traffic noise is projected to be two dBA higher, in general, across the entire lagoon. As a result, the majority of the least tern nesting area east of I-5 would experience an increase of two dBA over existing conditions, which range from 58 to 64 dBA. Least terns nesting on the western end of the nesting area may be more likely to be adversely affected than those located further east. Regardless, as described for San Dieguito Lagoon, it should be noted

[9] The variation in potential impact relates to whether construction phasing of the final two HOV/Managed Lanes could be advanced from occurring in the currently anticipated 2031 to 2035 timeframe to the 2010 to 2020 timeframe. Discussion of this possibility is provided under Environmental Consequences, Phasing of the Optimized Bridge, below.

that although population numbers have undergone natural fluctuations over the years, species have continued to consistently forage, nest, and breed, within suitable habitat in areas subjected to a wide range of noise levels (including noise in excess of 70 dBA). Overall, I-5 is currently eight lanes in width across the lagoon; combined with surrounding urban development, the lagoon is currently affected by nighttime lighting, invasive animal and plant species, and bisected habitats that could result in edge effects. The *I-5 NCC Project* would result in incremental increases to these indirect effects already affecting the habitat.

The proposed bike/pedestrian path and pedestrian path could also contribute to indirect impacts at Batiquitos Lagoon. As noted above, the northern abutment bench cannot be split into two levels to provide for wildlife movement wholly separated from the pedestrian path, and both human and animal populations would use the same footprint. The majority of wildlife movement is expected to occur at night, however, when pedestrians would not be expected to be present. Also as noted, the existing unpermitted trail and bridge have resulted in trampling of existing vegetation, as well as indirect edge effects along the trail, which is unrestricted by fences and signs. The proposed pedestrian path would cross the high marsh on a boardwalk where the existing trail cuts across to the freeway slope from the cul-de-sac. On slope, the pedestrian path would be fenced and signed to keep pedestrians on the trail and no pets would be allowed. Although use of this path would be likely to be more frequent than existing trail use, the path would be further upslope away from the marsh and fenced to keep pedestrians from moving off the improved area. This should minimize indirect impacts and eliminate the trampling of vegetation and associated erosion that are occurring on the unpermitted trail. The bike/pedestrian path would extend across the lagoon on the west side of I-5 and would be located near the top of the freeway slope in order to minimize indirect impacts to the adjacent wetlands. The bike/pedestrian path also would be fenced and signed to keep bikes on the bike/pedestrian path and off pedestrian-only paths and trails. No turn outs would be provided for users to stop beside the lagoon.

Indirect effects such as increased dust, lighting, invasive species, and noise would be minimized through the conservation measures identified in the Draft EIR/EIS and this document.

Hydrology/Hydraulics

Additional Design Considerations for Lagoon Crossing Alternatives

Two studies have been completed to look at different design options for construction of the I-5 bridge (*Table 3.1.6*). The Phase 2 Hydrodynamic Study was completed by Jenkins, Chang, and WRA (UCSD et al. 2010). This study identified four bridge options, two of which were considered acceptable by the resource agencies. The double wide channel would increase the channel under the I-5 bridge from 106 feet to 212 feet[10] while retaining existing shoaled depth (-5.3 feet) and side slopes (2:1, supported by riprap). This bridge option would cost $7.13 million more than a $13.4 million baseline I-5 bridge 246 feet in length. The Chang Channel option would deepen the channel to -7.0 feet, and make the side slopes steeper at a 1:1 slope (also supported by riprap), which would result in a channel bottom that is 180 feet wide and -7.0 feet deep. The Chang Channel would allow a deeper and wider channel by using steeper slopes. Both options would increase tidal range in the eastern basin and reduce flow

[10] Phase 2 studies modeled the channel as a trapezoid with a flat bottom width of 106 feet and a depth of -5.3 feet. The subsequent optimization study model was based on the as-built channel with a 66-foot-wide bottom sloping up at 4:1 (131 feet at -1.0 foot) to meet the 2:1 slope.

velocities under the I-5 bridge (*Table 3.1.6*). This bridge option would cost $1.26 million more than a baseline I-5 bridge 246 feet in length.

Optimization Analysis

The resource agencies requested additional study of the lagoon to determine potential system-wide improvements that could be realized by looking at a wider cross section of I-5 bridge channel dimensions and also at optimizing the railroad bridge and channel design features. The resulting optimization technical study (the Batiquitos Lagoon Bridge Optimization Study 2012) indicated a wider/deeper channel would be needed similar to the Chang Channel, but with side slopes of 2:1. Final optimized channel dimensions were determined to include a 134-foot wide channel bottom at -7.0 feet deep, with 2:1 slopes armored with riprap (refer to *Table 3.1.6* and the optimization technical study). The proposed channel incorporates the 134-foot wide channel and the 4:1 sloping channel into a 183.5-foot channel of similar to slightly larger cross section. Additional widening of the channel beyond those specifications would result in only 0.25 inch of tidal range for another 40 feet of channel width. The fluvial flows would also be optimized at the I-5 bridge, although the limitations of the coastal inlet would cause 100-year floodwater to back up upstream of the inlet. Although the 100-year flood fluvial flows remain slightly elevated upstream of each bridge, no infrastructure would be impacted and additional channel widening provides minimal change. The studies showed that the railroad bridge would also benefit from a wider and deeper channel. The railroad channel would be optimized with an increase in the channel bottom width from 162 to 202 feet, and an increase in the channel depth from -6.35 feet to -7.0 feet.

Since both the railroad and I-5 bridges are proposed for replacement as part of the LOSSAN double tracking effort and *I-5 NCC Project,* the optimization technical study provided modeling for optimizing tidal and fluvial flows through both of these bridges. Because the Pacific Coast Highway 101 bridge and inlet were recently installed and designed for inlet stability utilizing a previously modeled flow regime, changes to the inlet were not modeled as part of the project optimization technical study.

The combination of the wider railroad and I-5 bridges would result in maximum tidal ranges of 7.35 feet in the eastern basin and 7.4 feet in the central basin (*Table 3.1.6*). The ocean has a maximum tidal range of 8.37 feet in this area; however, the gauge at the eastern end of the ocean inlet (west of the railroad and I-5 bridges) mutes the tide to 7.51 feet under existing conditions. Therefore, minimal muting (0.16 to 0.11 feet) is attributable to the railroad and I-5 bridges. The increase of tidal range would result in additional intertidal habitat in the eastern basin. The increased channel dimensions would also decrease flow velocities under the bridges, resulting in reduced scour under the I-5 and railroad bridges.

Fluvial flows associated with the 100-year flood were modeled for the existing channel dimensions, and the optimized channel dimensions. As noted, floodwaters currently backup in all three Batiquitos Lagoon basins. By increasing the channel dimensions of both the I-5 and the railroad bridges there would be a lower water level in the eastern basin, but a higher level in the central basin. All proposed bridge dimensions would pass the 100-year flood with at least 6.6 feet of freeboard.

For the optimized I-5 bridge in the dredged condition (i.e., sediment removal at the central basin; as well as the I-5, railroad and inlet channels), tidal velocity would decrease from 4.3 to 2.4 feet per second at flood tide, and from 3.9 to 2.3 feet per second at ebb tide. By comparison, these velocities would only change to 2.2 feet per second at flood tide and 2.0 feet per second

at ebb tide under the shoaled optimized condition; which was modeled with the pre-dredged bathymetry in 2008. The reduced velocities for the optimized condition would allow for reduced scour under the bridge while still transporting sand and sediments to the inlet. Inlet velocities would remain similar to existing conditions due to the fixed nature of the recently modified inlet.

Sediment transport under extreme flood velocities also would be decreased with the optimized channels under the bridges resulting in less scour and erosion along the channels. The velocity in the optimized channel would reduce the time for the flood flows to travel through the east basin from 0.7 hour to 0.6 hour, thereby reducing the time for sediment to settle. Accordingly, the sediment transport capacity under the optimized bridge would be slightly improved compared to existing conditions.

The overall residence time (the average time a particle takes to pass through a hydraulic system) in Batiquitos Lagoon is less than one week, indicating that circulation in the lagoon is good. With the optimized channel improvements, the residence time in the eastern basin would be reduced from 5.8 days to 5.4 days.

A projected SLR of 4.5 feet in the year 2100 would result in the 100-year flood surface water levels increasing by approximately two feet at both the railroad and I-5 bridges. The water surface elevation would increase by approximately 0.1 foot with the optimized versus the existing channel. Both the railroad and I-5 bridges would be expected to pass the 100-year flood flows with SLR. Assuming the replacement railroad bridge has a similar soffit height to the existing bridge, it would have a freeboard of at least 7.0 feet. The optimized I-5 bridge would have a slightly lower soffit than the existing I-5 bridge, but would have a projected freeboard of approximately 4.8 feet during the 100-year flood with SLR. The only bridge that would not pass the projected 100-year flood with SLR is the East Coast Highway bridge, which is slightly lower than the West Coast Highway bridge, and would have a projected freeboard deficit of 0.1 foot.

Appropriate Bridge and Optimized Channel

The proposed bridge (at a cost of $3.85 million over baseline costs) would provide optimal function without over engineering (i.e., project modeling as part of Phase 2 studies showed that additional length would provide only minimal benefit relative to the associated cost. The proposed bridge length is recommended as a result of the Batiquitos Lagoon Bridge Length Optimization Study and is included here as an enhancement component. The proposed bridge cross section would have a flat-trapezoid when built; therefore, the channel dimensions would be different from those modeled. The proposed channel dimensions would be 183.5 feet wide at the bottom with 2:1 slopes on the abutments. The channel width at -1 foot NGVD remains 200 feet, which is the same cross section modeled at this elevation. The resulting cross section of the designed bridge is similar to slightly larger than modeled. The trapezoid design would be a more hydrologically efficient design (Moffat & Nichol 2012: personal communication). Based on the above discussion, the optimized I-5 bridge would result in increased tidal range in the eastern basin by 0.7 feet and 0.5 feet in the central basin. The increased tidal range would result in increased salt marsh and other intertidal habitats, with less subtidal habitats. The increased area would enhance flushing and reduce residence time, thereby increasing water quality within the lagoon. Additional widening of the channel (requiring a longer bridge) beyond proposed specifications would result in only 0.25 inch of tidal range improvement for another 40 feet of channel width.

Phasing of the Optimized Bridge

Implementation of the new bridge structures over Batiquitos Lagoon would be staged to maintain operational capacity throughout construction. Current project funding and phasing would result in the extension of one HOV lane in each direction in the median from Manchester to SR-78 prior to 2020, followed by Batiquitos Lagoon bridge replacement between 2021 and 2030. This phasing plan would require that then existing lanes (five lanes in each direction) remain open during construction, resulting in the need to construct two (north- and southbound) bridges that would each be 122 feet wide, or 24 feet wider than necessary to accommodate the proposed project (*Figure 3-1.5b*). The proposed bridge with the optimized channel would permanently impact 4.32 acres of ACOE jurisdictional habitat and 4.80 acres of State wetland with roadbed fill (calculated as impacts from new roadbed fill minus the created habitat from the widened channel; *Table 3.1.6* and *Figure 3-1.5c*). The wider/longer bridge would also result in 0.56 acre of additional shaded open water.

An option under consideration to reduce wetland impacts would include advancing the replacement of the Batiquitos bridge in the phasing plan, so that bridge replacement would occur during the HOV extension. If advanced in time, only four existing lanes would have to be open in each direction during construction. This would reduce each bridge footprint (north- and southbound) to 98 feet wide, with a 19.2 foot gap located between the bridge structures. This configuration would permanently impact 3.13 acres of ACOE jurisdictional habitat and 3.58 acres of State wetland. The reduced size I-5 separated bridges would also result in 0.44 acre of additional shaded open water. This would minimize the wetland impacts by 1.19 and 1.22 acres, respectively, for ACOE and State jurisdictions compared to the currently proposed phasing plan, and result in less shading of open water. Project funding would have to be obtained and approved in the first phase (2010[11] to 2020) instead of the second phase (2021 to 2030) to move forward with this option.

Impacts to waters of the U.S. and State wetlands would be mitigated as described in *Section 3.1.3* of this document.

3.1.2.3 *Buena Vista Lagoon*

Affected Environment

Existing Conditions and Environmental Concerns

Buena Vista Lagoon is the northernmost lagoon in the corridor, bordered by the City of Carlsbad on the south and the City of Oceanside on the north. The lagoon is segmented into four basins by four hydraulic connections that include channels under the LOSSAN rail and I-5 bridges, culverts under Coast Highway, and a weir between the lagoon and the ocean. The four basins are named according to their associated downstream hydraulic connections; Weir Basin, Railroad Basin, Coast Highway Basin, and I-5 Basin (*Figure 3-1.6a*).

Buena Vista Lagoon has developed into a primarily freshwater system. This is due to the weir at the mouth of the lagoon, which allows only minimal inflow of seawater into the westernmost basin. A feasibility study and some restoration concepts were completed several years ago as part of a regional planning effort that focused on restoration of Buena Vista Lagoon. Those

[11] Elements by phase are consistent with the 2050 RTP, advanced mitigation that started in 2010, and are depicted on *Figures 2-3.1a* through *2-3.1c*.

studies identified several options for Buena Vista Lagoon restoration plan, including a saltwater alternative restoring tidal flow to the entire lagoon, a modified saltwater alternative, and two freshwater alternatives (refer to the discussion in the I-5 Bridge Study at Buena Vista Lagoon 2012).[12]

The three north-south transportation facilities between the basins constrain water flow within the lagoon. The existing railroad bridge has dimensions that are 17 feet wide at the channel bottom and 280 feet wide at the surface with a maximum depth of -2.5 feet NGVD. Side slopes under the railroad bridge vary from 2:1 on the north abutment to 7:1 on the south abutment. The bottom of the existing railroad bridge is at an elevation of 11.1 feet NGVD. The Coast Highway culverts support the bottom of the road at an elevation of 8.2 feet NGVD. The existing culvert channel varies from 25 to 29 feet wide and -6 to -3 feet NGVD deep. The existing I-5 bridge over Buena Vista Lagoon is approximately 102 feet long and 184 feet wide (*Figure 3-1.6b*). The crossing has a channel bottom that is 24 feet across with a depth of -2 feet NGVD, and 99 feet at the maximum water surface elevation.

Based on surveys referenced in the Draft EIR/EIS and updated data from CDFG in 2011, wildlife in Buena Vista Lagoon consists primarily of small mammals and birds, with potentially sensitive species presence including light-footed clapper rail and Belding's savannah sparrow (*Table 3.1.7*). The light-footed clapper rail is known to nest in cattails within the lagoon (*Figure 3-1.6c*). Belding's savannah sparrows also nest within the lagoon, but are not found adjacent to I-5 due to the limited amount of appropriate habitat. Striped mullet (*Mughil cephalus*) were the only native fish species identified in the lagoon during sampling in 2003 (Everest 2004). This fish is neither threatened nor endangered, and is not a special status species. Although the tidewater goby has been previously recorded at Buena Vista Lagoon, the presence of the tidal weir lowers expectation of their current presence. Previous sampling for the tidewater goby has not detected the species; however, additional sampling would be completed within 500 feet of I-5 during summer 2012 as part of this project.

Environmental Consequences

Proposed Improvements

The current enhanced I-5 bridge over Buena Vista Lagoon is proposed to be 197 feet long and 336 feet wide. Channel bottom width is estimated to be 105 feet wide and -6.0 feet NGVD (*Table 3.1.7*). Sixteen-foot benches for wildlife crossings would be built at both north and south I-5 abutments to accommodate use by small- and medium-sized mammals. The currently proposed cross section is reflected on *Figure 2-2.10g. (*See *Figure 3-1.6b* for bridge length). The cost of this enhanced bridge is $14.6 million; the cost of the I-5 bridge proposed in the Draft EIR/EIS was $7.6 million.

Biological Resources and Community Enhancements

The original proposed crossing would have placed 1.12 acres of additional roadbed fill into ACOE waters of the U.S. and 1.39 acres of fill into State wetland. Approximately 0.15 acre of additional shaded waters of the U.S./State wetland would occur (*Table 3.1.7*). Widening of I-5 and replacement of the bridge would result in permanent project-related impacts at Buena Vista

[12] The western basin and mouth of the lagoon are privately owned, which has made restoration planning for future improvements to the lagoon difficult.

Lagoon including 0.73 to 0.81 acre of ACOE jurisdictional habitat and 1.0 to 1.14 acres of State wetland[13], as well as shading of an additional 0.39 to 0.48 acre of open water.

Based on surveys to date, a portion of the territory of one pair of clapper rail may be temporarily impacted during construction on the west side of the west- to southbound on-ramp from SR-78 to I-5. As noted above, sampling for tidewater goby would be completed within 500 feet of I-5 during summer 2012 as part of this project. Direct impacts to each of these species would be mitigated as described in *Section 3.1.3* of this document. The lack of Belding savannah sparrow habitat within the I-5 construction footprint eliminates the potential for direct impact to this species.

Indirect impacts to sensitive species can result from increased lighting, increased exposure to invasive species, edge effects, and increased potential for pollution from runoff, as well as long-term increases in noise. I-5 is currently eight lanes in width across the lagoon, and combined with surrounding development, results in an existing condition that includes nighttime lighting, access from invasive species, and bisecting of habitats that could result in edge effects. As such, a build alternative would result in only incremental increases to indirect effects already affecting the habitat. The ambient noise levels measured within the lagoon ranged from 63-64 dBA. With respect to indirect noise impacts in particular, the anticipated future increase in traffic volumes on I-5 combined with the proposed wider footprint of the facility, would result in an increase of approximately two dBA across the lagoon. As described elsewhere in this chapter, however, it should be noted that although population numbers have undergone natural fluctuations over the years, species have continued to consistently forage, nest, and breed, within suitable habitat in areas subjected to a wide range of noise levels (including noise in excess of 70 dBA). Regardless, most of the sensitive species are located a relatively long distance from the freeway, with a correspondingly lessened sensitivity to a two dBA increase in noise. Documented special status bird species with known locations that could be affected include four locations of the light-footed clapper rail (two within the current 62 dBA L_{eq} noise contour, and two within the 56 dBA L_{eq} noise contour), and eight locations of Belding's savannah sparrow (all within, or in close proximity to, the 58 dBA L_{eq} noise contour). Although not expected to nest within the lagoon study area, other sensitive species whose habitat occurs within the lagoon habitat potentially affected by the increased traffic noise include the western snowy plover and California least tern. These species have been documented in the vicinity of the lagoon and may forage over the open water of the lagoon; with an associated potential to be affected by increased noise. Indirect effects such as increased dust, lighting, invasive species, and noise would be minimized through the conservation measures identified in the Draft EIR/EIS and *Section 3.1.3,* of this document.

Hydrology/Hydraulics

<u>Additional Design Considerations for Lagoon Crossing Alternatives</u>

The Draft EIR/EIS originally proposed to replace the I-5 bridge with bridge dimensions to be specified in, and required by, the Buena Vista Lagoon restoration plan that was underway. A number of Buena Vista Lagoon restoration plan alternatives were developed under the direction of several federal and State agencies including the California State Coastal Conservancy (SCC), USFWS, and (CDFG). Due to issues with the private ownership of the

[13] The variation in potential impact relates to whether construction phasing of the final two HOV/Managed Lanes could be advanced from occurring in the currently anticipated 2031 to 2035 timeframe to the 2010 to 2020 timeframe. Discussion of this possibility is provided under Environmental Consequences, Phasing of the Optimized Bridge, below.

mouth of the lagoon, however, Buena Vista Lagoon restoration plan activities were suspended. The resource agencies have asked that Caltrans model four potential Buena Vista Lagoon restoration plan alternatives to determine an optimal bridge length for I-5 that would not limit potential future Buena Vista Lagoon restoration plan activities. This modeling was completed as part of the I-5 Bridge Study at Buena Vista Lagoon 2012.

These four alternatives were selected because the proposed grading and outlet/inlet configurations represent a reasonable range of potential restoration conditions for Buena Vista Lagoon plan. Analysis of these alternatives provided ranges of dimensions for potential hydraulic connections, which would in turn affect the design of the bridge structure. The four alternatives represent options for retention of the lagoon as a primarily freshwater resource as well as returning it to a saltwater regime, and include:

- Saltwater Alternative 2-1
- Saltwater Alternative SW2-A
- Freshwater Alternative 1
- Freshwater Alternative FW-A

Saltwater Alternative 2-1 represents the Buena Vista Lagoon restoration plan configuration of a salt water hydrologic regime originally developed for the Buena Vista Lagoon restoration project in 2008. This alternative would achieve Buena Vista Lagoon restoration plan objectives primarily through elimination of the existing exotic vegetation, dredging to remove excess sediment, and establishment of continuous tidal exchange. The existing weir would be replaced with a tidal inlet to provide continuous tidal exchange between the lagoon and ocean. The tidal inlet would require stabilization with two jetties that would extend to the Mean Lower Low Water (MLLW) contour. The bottom elevation of the Railroad and Weir Basins would be dredged to between -12 and -15 feet NGVD to provide a sediment trap for sand entering the lagoon from the ocean. Prominent features of this alternative were described in the 2008 Hydraulic Study Report (Everest 2008).

Saltwater Alternative SW2-A is the most recent salt water Buena Vista Lagoon restoration plan alternative developed for the lagoon. In this alternative, a channel would trend along the center of the I-5 and Coast Highway Basins at -3.3 feet NGVD, with the two banks of the channel being graded to a slope not to exceed 1:8 (vertical: horizontal). Downstream of the railroad bridge, the channel would widen and form a basin with a uniform depth of -3.3 feet NGVD. The tidal inlet channel would be constructed with an initial bottom elevation of -2.0 feet NGVD, but no jetties would be constructed to stabilize the inlet channel. Prominent features of this alternative were described in the 2011 technical memo (Everest 2011a).

Freshwater Alternative 1 represents retention of the fresh-water hydrologic regime analyzed as part of the Buena Vista Lagoon Restoration Project Feasibility Study in 2004. This alternative would achieve Buena Vista Lagoon restoration plan objectives primarily through elimination of the existing exotic vegetation and dredging to remove excess sediment. The existing ocean outlet weir would be replaced with an 80-foot wide weir, consistent with a weir widening project proposed by the City of Oceanside. The invert elevation of the weir would be kept at the existing weir invert elevation, which is 5.6 feet NGVD. The bottom elevation of the Railroad and Weir Basins would be dredged to between -12 and -15 feet NGVD. Prominent features of this alternative were described in the 2008 fluvial hydraulics report (Everest 2008). It should be noted that for the SLR analysis completed during lagoon optimization studies, it was assumed that the invert elevation of the weir would be raised by the projected value of SLR (4.5 feet) to

keep ocean water from entering the lagoon. This assumption was necessary to preserve the fresh water condition of the lagoon under this freshwater alternative.

Freshwater Alternative FW-A is the most recent freshwater alternative developed for the lagoon. The central portions of each basin would be dredged to maintain a water depth of about six feet (bottom elevation of about 0 feet NGVD) to minimize the future encroachment of reeds (cattails) throughout the lagoon. Similar to Freshwater Alternative 1, assumptions include replacement of the existing ocean outlet weir with an 80-foot-wide weir in accordance with the City of Oceanside proposal, as well as retention of the invert elevation of the existing weir at 5.6 feet NGVD. Prominent features of this alternative were described in the 2011 technical memo (Everest 2011a). SLR assumptions relative to the invert elevation of the weir were the same as those described above for Freshwater Alternative 1.

Optimization Analysis

The fluvial hydraulic analysis studied the impact of a 100-year return period storm along Buena Vista Creek. To evaluate impacts due to storms of lesser magnitudes, five other flood events (2-year, 5-year, 10-year, 25-year, and 50-year) were included in the analysis of one of the salt water alternatives. The flood impact of storms coupled with high tides was assessed by applying the peak of the storm hydrograph, timed to match a tide elevation of mean higher high water (MHHW). In addition to evaluating impacts due to storms under current water levels, the storm impact coupled with high tides in Year 2100 was analyzed with a higher water level to evaluate the impact of anticipated SLR.

In the initial model run for each alternative, the hydraulic connections beneath the bridges were modeled using as-built dimensions. In subsequent simulations, the dimensions of the hydraulic connections were modified until the simulation results indicated that the storm flow through these hydraulic connections would be unimpeded. This process was conducted for fluvial flow coupled with both the current tide level and Year 2100 tide level with SLR (refer to the optimization technical study).

Multiple scenarios were modeled for each alternative that either increased the channel width, depth, or a combination of wider and deeper channel dimensions to determine the optimal configuration of all three bridge crossings over the lagoon. The fluvial flows were modeled as the controlling factors of the channel dimensions. The optimized channel configurations were defined as the dimensions where the surface water levels were very similar between basins, showing little or no flow constrictions.

The results of the optimization technical study found that the railroad bridge was sufficiently wide, and that the channel only required dredging from -2.5 feet NGVD to -6 feet NGVD (*Table 3.1.8*). The Coast Highway crossing, however, would require a wider and deeper channel, as well as potential elevation of the road itself to accommodate the flow under the road, particularly if the maximum predicted SLR occurs.

Table 3.1.8
LAGOON RESTORATION DESIGN GUIDELINES FOR BRIDGE DIMENSIONS

Bridge	Parameters	As-Built	Salt Water Alts	Fresh Water Alts	Design Guideline
Railroad	Invert Elevation (ft, NGVD)	-2.5	*-4*	*-4*	*-6***
	Bottom Width @ Invert (ft)	17	17	17	17
	Channel Width @ MWE (ft)	280	280	280	280
	Soffit Elevation (ft, NGVD)	11.1	*	*	*
	Max Water Elevation (ft, NGVD)	--	*10.1*	*14.1*	*15*
Coast Hwy	Invert Elevation (ft, NGVD)	-6/-3	*-6*	*-6*	*-6*
	Bottom/Top Width (ft)	25/29	*110*	*110*	*110*
	Soffit Elevation (ft, NGVD)	8.2	*	*	*
	Max Water Elevation(ft, NGVD)	--	*10.3*	*14.3*	*15*
I-5	Invert Elevation (ft, NGVD)	-2	*-6*	*-6*	*-6*
	Bottom Width @ Invert (ft)	24	*105*	*105*	*105*
	Width (ft) @ Existing Soffit	99	*180*	*180*	*180*
	Channel width @ MWE (ft)		*147*	*157*	*160*
	Existing Soffit Elevation (ft, NGVD)	23.1			
	Max Water Elevation (ft, NGVD)	--	*10.4*	*14.4*	*15*

Italics = different from as-built**.**
* Proposed soffit elevation should be max water elevation + value (such as freeboard) based on design criteria
**Two feet added to the desired invert elevation for fluvial flows to accommodate the near full tide range.

The optimized I-5 bridge improvements over Buena Vista Lagoon would deepen the channel from -2 feet to -6 feet NGVD, and increase the bottom width of the channel from the existing 24 feet to 105 feet (*Tables 3.1.7 and 3.1.8*). The top width of the channel would be 160 feet at the maximum water surface elevation of 15 feet (*Figure 3-1.6b*).

The optimized channel cross sections would be adequate to accommodate flows assuming a 4.5-foot SLR in Year 2100 with the following exceptions: (1) the soffit (bottom of bridge) elevation of Coast Highway would be too low to pass the flow; and (2) the soffit elevation of the railroad would be too low for freshwater alternative FW-A under current conditions, and too low for all Buena Vista Lagoon plan restoration alternatives with future SLR. The railroad soffit elevation would have to be raised from 11.1 feet to 13.6 feet plus freeboard to accommodate the 100-year flood and SLR for all alternatives (*Table 3.1.7*).

Residence times were modeled for the saltwater alternatives with the optimized crossings. Alternative SW-A performed better than Alternative A-1 in the I-5 Basin with a maximum residence of 6 days versus 26 days.

Appropriate Bridge and Optimized Channel

Based on the above discussion, a bridge length of 197 feet at a cost of $14.6 million has been identified as optimal; i.e., the length at which tidal range and flood conveyance would be most favorable, and further increase in bridge length would bring only minimal benefit. This is approximately double the $7.6 million cost of simply replacing the existing length bridge with a greater width. The proposed bridge length is recommended as a result of the Bridge Length

Optimization Study and is included here as an enhancement component. Specifically, bridge optimization would increase flow through the lagoon and improve water quality. These optimized channel configurations would support a range of Buena Vista Lagoon restoration plan alternatives. The I-5 and railroad bridge improvements anticipated as part of the current project and LOSSAN double-tracking would support the Buena Vista Lagoon restoration plan alternatives. Localized downstream flooding in the Coast Highway Basin could occur, however, if the Coast Highway crossing is not changed during I-5 crossing optimization.[14]

Phasing of the Optimized Bridge

Implementation of the new bridge structures over Buena Vista Lagoon would be staged to maintain operational capacity throughout construction. Current project phasing and funding would result in the extension of one HOV lane in each direction from Manchester to SR-78 prior to 2020, followed by Buena Vista Lagoon bridge replacement between 2021 and 2030. This phasing plan would require that then existing lanes (six lanes in each direction) remain open during construction. This would result in the construction of a bridge that is 336 feet wide, or 43 feet wider than necessary to accommodate the proposed optimized LPA (*Figure 3-1.6b*). This proposed bridge with the optimized channel would permanently impact. 0.81 acre of ACOE jurisdictional habitat and 1.14 acres of State wetland (calculated as impacts from new roadbed fill minus the created habitat from the widened channel; *Table 3.1.7* and *Figure 3-1.6c*). The wider bridge would also result in 0.48 acre of additional shaded open water.

An option under consideration to reduce wetland impacts would include advancing the replacement of the Buena Vista bridge in the phasing plan, so that bridge replacement would occur during the HOV extension. If advanced in time, only five existing lanes would have to be open in each direction during construction. This would reduce the bridge width to 293 feet. This configuration would permanently impact 0.73 acre of ACOE jurisdictional habitat and 1. 0 acres of State wetland (calculated as impacts from new roadbed fill minus the created habitat from the widened channel) and would result in 0.39 acre of additional shaded open water. This option would therefore minimize the direct wetland impacts by 0.08 and 0.14 acre, respectively, for federal and State jurisdictions compared to the currently proposed phasing plan, and would result in less shaded water at 0.08 acre. Project funding would have to be obtained and approved in the first phase instead of the later phase to move forward with this option.

Impacts to waters of the U.S. and State wetlands would be mitigated on a corridor-wide basis as described in *Section 3.1.3*, immediately following.

3.1.3 Avoidance, Minimization, and/or Mitigation Measures

3.1.3.1 *Avoidance and Minimization Measures*

Avoidance and Minimization through Project Design

Impacts of the proposed widening of the I-5 lagoon crossings, with respect to ACOE and State jurisdictional habitats and upland habitats, would be unavoidable because I-5 is an existing north-south transportation corridor that transects the east-west lagoon drainages. All of the project build alternatives incorporate design features to minimize such impacts. Additional conservation measures proposed to avoid or minimize impacts are discussed in the next section.

[14] The resource agencies may identify replacement of the Coast Highway crossing as part of the resource enhancement plan for mitigating the *I-5 NCC Project*. The benefit of the bridge lengthening will not be fully evident until a restoration project is identified and implemented in Buena Vista Lagoon.

To minimize impacts to all sensitive habitats, the slopes of the freeway were designed at a steeper 2:1 grade versus the standard 4:1 grade.

To further minimize impacts, retaining walls were also included in the project design on cut slopes, but could not be used on fill slopes. Through analysis of lagoon sediment data from geotechnical borings, it was determined that lagoon soil liquefaction would prevent the use of retaining walls to minimize the roadbed fill in the lagoon. Soil liquefaction requires that any structures taller than approximately 6 feet have support piles that are driven to bedrock, which is located at a depth of over 100 feet. All pilings for the bridge supports would be driven to this depth, but this would not be practical for retaining walls. Riprap is used to protect the existing abutments and would also be used to protect the abutments of the proposed bridges. Due to the depth of bridge pilings, riprap is not required to armor the channel bottom.

Potential impacts from auxiliary lanes would be minimized where possible, especially in the vicinity of the lagoons. Auxiliary lanes were only included in the project design where required to relieve traffic congestion and weaving issues between on- and off-ramps. For instance, potential impacts associated with a proposed auxiliary lane between La Costa Avenue and Poinsettia Avenue across Batiquitos Lagoon were avoided, based on elimination of this potential auxiliary lane when traffic analysis determined that it would not be required.

To avoid impacts to wetlands from fill associated with creation of 12-foot-wide bike/pedestrian paths, short retaining walls (six feet or lower in height) would be used.

Another impact minimization option being examined, particularly at Batiquitos Lagoon and Buena Vista Lagoon, would involve obtaining funds to replace these bridges in the first phase of construction (prior to construction of a proposed HOV lane in the median), instead of later in the construction process. This would reduce the overall bridge widths required for staging the bridge replacements, thus reducing wetland impacts by more than an acre at each lagoon. Because auxiliary lanes in each direction are proposed at Agua Hedionda Lagoon, resulting in the need for a wider finished bridge, accelerated timing of bridge replacement would not minimize wetland impacts at this location.

Conservation Measures

In addition to the impact minimization design features discussed above, the following conservation measures are proposed to avoid or minimize project-related impacts to habitats and species.

- All habitats outside the permanent and temporary construction limits would be designated as Environmentally Sensitive Areas (ESAs) on project maps. ESAs would be temporarily fenced during construction with orange plastic snow fence. No access would be allowed within the ESAs.

- Where sensitive species locations have been identified in the EIR/EIS, pre-construction surveys would confirm sensitive species location prior to construction.

- All removal of native vegetation or non-native shrubs and trees located within the impact areas would be completed outside of the bird breeding season (February 15 to August 31), if possible, to avoid impacts to nesting birds. Otherwise, a qualified biologist would thoroughly survey all vegetation prior to removal to ensure there are no nesting birds on site. If nesting birds are identified on site, vegetation removal would be delayed until the chicks have fledged or the nest has failed.

- Exclusion devices would be installed on bridge drain holes and ledges during the non-breeding season (September 1 through February 15) to stop swallows, swifts, and any other birds from nesting on or within bridges to be demolished.

- All pile driving near the lagoons would be completed outside the bird breeding season (February 15 to September 15) to minimize construction noise impacts to bird species around the lagoons. Pile driving is anticipated during bridge falsework construction.

- A channel large enough for fish movement would be kept open throughout construction within the San Luis Rey River and all of the lagoons.

- All debris from the replacement of old bridges or construction of new bridges would be contained, so that it does not fall into rivers and lagoons.

- During in-water bridge construction activities at all lagoons, bubble curtains or other methods to minimize acoustical impacts to aquatic species would be implemented. These measures would be developed in conjunction with the resource agencies when the project design and construction methodology is further developed.

- Eelgrass surveys would be completed at all lagoons with the exception of Buena Vista prior to bridge construction. In lagoons were eelgrass is identified in proximity to I-5 widening, eelgrass surveys would continue during and after construction, and mitigation would be implemented in accordance with the REP. Eelgrass mitigation specifics will be provided in the Final EIR/EIS.

- Special care would be taken when transporting, using, and disposing of soils with invasive weed seeds. All heavy equipment would be washed and cleaned of debris prior to entering a lagoon area, to minimize spread of invasive weeds.

- A qualified biologist would be made available for both the pre-construction and construction phases to review grading plans, address protection of sensitive biological resources, and monitor ongoing work. The biologist should be familiar with the habitats, plants, and wildlife of the project area, and maintain communications with the resident engineer, to ensure that issues relating to biological resources are appropriately and lawfully managed.

- Detention basins/bioswales would be placed in the loop ramps, and bioswales would be placed on slopes, as appropriate to treat runoff from the freeway.

- Appropriate best management practices (BMPs) would be used to control erosion and sedimentation. No sediment or debris would be allowed to enter the creeks, rivers, or lagoons.

- Cut slopes would be revegetated with native upland habitats with composition similar to those within the Study Area. Fill slopes and areas adjacent to wetlands and drainages would be revegetated with appropriate native upland and wetland, similar to those currently found on site where feasible. The revegetated areas would have temporary irrigation and would be planted with native container plants and seeds selected by the biologist. At least three years of plant establishment/maintenance on these slopes would be provided to control invasive weeds. Bioswales and detention basins would be

planted with appropriate native species as determined by the biologist and storm water personnel. Slopes adjacent to developed urban areas would be vegetated with native and drought tolerant non-invasive species selected by the biologist and landscape architect. Interchanges located in urban areas would be landscaped with native or ornamental non-invasive species, consistent with current landscaping.

- Duff from areas with coastal sage scrub, maritime succulent scrub, and maritime chaparral would be salvaged to the extent practicable to aid in revegetating slopes with native habitats.

- All temporary impact areas would be revegetated and restored to pre-existing conditions, including being returned to original grade, as feasible.

- Fueling of construction equipment would only occur at a designated area at a distance greater than 100 feet from drainages/lagoons and associated plant communities, to preclude adverse water quality impacts. Fuel cans and fueling of tools would not be allowed inside the drainages.

- Lighting used at night for construction would be shielded away from environmentally sensitive areas.

- Dust generated by proposed operations would be controlled with BMPs.

- All trails would be fenced and signed to keep pedestrians on the trails and out of adjacent habitats.

- If wandering skipper butterflies are found during surveys that would be conducted at Los Peñasquitos and San Dieguito Lagoons prior to submittal of permit applications to the resource agencies, impacts would be mitigated through habitat already identified for preservation as detailed in the REP described below.

- Impacts to jurisdictional waters (waters of the U.S./State) and native upland habitats would be mitigated on a corridor-wide basis through the proposed North Coast Corridor TREP, currently being developed. This program is discussed in the compensatory mitigation section below, and would be fully described in the Final EIR/EIS for the *I-5 NCC Project*.

3.1.3.2 *Compensatory Mitigation*

Resource Enhancement Program (REP)

The North Coast Corridor includes approximately 30 miles of coastline that is recognized for a number of unique and important marine and environmentally sensitive resource areas. The Public Works Plan/Transportation and Resource Enhancement Program (PWP/TREP) being developed under the Coastal Act identifies and coordinates the included construction projects and mitigation under one umbrella; supporting permitting by the California Coastal Commission and federal consistency with the Coastal Act. Both the *I-5 North Coast Corridor Project* and LOSSAN double-tracking projects as well as some other enhancements (trails, train stations, etc.) would be mitigated through the Resource Enhancement Package (REP). Although the REP covers all corridor impacts as part of the PWP/TREP, this Supplemental Draft EIR/EIS addresses mitigation relevant and specific to impacts identified for the *I-5 NCC Project*. The

coastal watersheds, lagoons, and upland areas in the corridor provide a range of diverse habitats and ecosystems that support a variety of plant and wildlife species. Due to the location of the proposed North Coast Corridor improvements for the *I-5 NCC Project*, the sensitive habitats traversed by the planned corridor improvements, and the sensitive species living along the corridors, all impacts to coastal resources cannot be avoided. The North Coast Corridor mitigation program for the *I-5 NCC Project* described herein has been developed to identify compensatory mitigation measures to address these unavoidable impacts, and to implement resource enhancement opportunities that exceed the benefits of standard compensatory mitigation programs. It comprises part of the PWP/TREP that is being developed for identified transportation project impacts within the jurisdiction of the Coastal Commission.

The large resource enhancement package for all PWP/TREP projects identifies regionally significant mitigation including creation of new habitat, restoration of San Elijo Lagoon and Buena Vista Lagoon, establishment of endowments for lagoon mouth maintenance, and preservation of important parcels of open space. Despite large impacts to habitats and species during construction, the overall health of the corridor habitats and species would be enhanced. The *I-5 NCC Project* includes benches for wildlife crossings at all lagoons. Bridges at San Elijo, Batiquitos, and Buena Vista lagoons would be lengthened to accommodate the channel dimensions identified in the optimization studies. Lengthening of the bridges would remove roadbed fill, create more wetland, and enhance tidal and fluvial flows and water quality in these lagoons. The longer bridges at San Elijo and Buena Vista lagoons would also facilitate restoration plans for these lagoons. Without the construction of these longer bridges, the restoration plans would be constrained.

The proposed REP employs a combination of measures to mitigate for coastal resource impacts resulting from implementation of the North Coast Corridor transportation improvements and community enhancement projects. The combined mitigation program approach recognizes the constrained, primarily built-out condition of the North Coast Corridor, which leaves few opportunities for land acquisition typically necessary to implement traditional, ratio-based habitat mitigation efforts. Even fewer opportunities exist in the North Coast Corridor for large-scale land acquisitions that could allow traditional ratio-based mitigation efforts to be focused in distinct areas with the goal of establishing large tracts of contiguous and diverse habitat areas within the corridor. However, the area is home to six major lagoon systems which represent some of southern California's most important natural resource areas. These lagoon systems and upper watersheds provide large, contiguous habitat areas that support sensitive habitats for a variety of plant and wildlife species, and that provide water quality, flood control, groundwater recharge, and recreation benefits. The North Coast Corridor's lagoon systems and their habitats are biologically unique and cannot be replicated elsewhere. As such, opportunities to protect these lagoon systems from potential future degradation and to enhance and expand habitat within these systems require comprehensive solutions with mitigation efforts focused less on ratio-based mitigation and more on ecosystem-wide enhancements. Given the unique ecological value of the corridor lagoons, opportunities to improve the ecological function of the systems exceed the benefits of pursuing only ratio-based mitigation efforts on the relatively small, fragmented, and isolated land areas remaining in the North Coast Corridor for such mitigation efforts.

The REP includes:

- Habitat mitigation parcels purchased for the North Coast Corridor program in consideration of the sites' contribution to protecting and enhancing the lagoon system and watershed function and values
- Preservation parcels, which contribute to regionally significant resources

- Lagoon crossing improvements related to bridge length, and channel width and depth, which inherently enhance lagoon system function and values
- Options for allocating funding from SANDAG's Environmental Mitigation Program for regionally significant restoration or enhancement opportunities and/or endowments for long-term resource maintenance needs

The REP approach to advancing habitat restoration and preservation mitigation projects ahead of *I-5 NCC Project* impacts, and designing transportation facility infrastructure improvements which inherently enhance lagoon system function and values, where feasible, would result in greater benefits to coastal resources on a corridor-wide level than if only ratio-based, project- and site-specific mitigation were employed.

Resource Enhancement Program Overview

The REP would provide for mitigation planning and implementation through the PWP/TREP process and permitting process of other resource agencies to effectively mitigate *I-5 NCC Project* impacts in a manner that addresses regionally significant resource enhancement and preservation needs. REP measures include strategically acquiring restoration opportunities, preserving existing environmentally sensitive habitat areas (ESHAs), and enhancing lagoon system function and values through bridge and channel improvements discussed above and facilitating restoration plans, all within the North Coast Corridor coastal zone area. The REP also would establish an endowment to increase the capacity for long-term stewardship of mitigation resources for the foreseeable future. As detailed in the following sections, the REP provides the planning and implementation framework to ensure the most valuable, high quality mitigation opportunities in the North Coast Corridor are identified, secured, and prioritized for implementation in a manner that cost-effectively utilizes available mitigation funding to maximize benefits to the corridor's natural resources.

Establishment of new and improved transitional habitat and buffer areas, restoration of freshwater wetlands, preservation and/or restoration of habitat areas via the purchase of land adjacent to corridor lagoons, and comprehensive lagoon restoration through transportation facility infrastructure improvements and funding of major restoration efforts would address water quality improvements and habitat needs of special-status plant and wildlife species, and would achieve the overall goal of enhancing biodiversity and habitat value throughout the corridor.

Resource Enhancement Program Funding

The *TransNet* Extension Ordinance approved by the San Diego voters in November 2004 established an Environmental Mitigation Program (EMP) for the advancement of mitigation for resource impacts associated with regional and local transportation projects. The REP is structured to support the region's efforts to develop a comprehensive regional mitigation strategy utilizing the *TransNet* EMP, to be implemented as an integrated element of the PWP/TREP Implementation Plan. The REP prioritizes expenditure of EMP funds on a corridor-wide level, with an emphasis on advanced habitat creation, restoration, enhancement, and preservation; improvement of the ecological health of sensitive habitats through funding of system-wide restoration; and establishment of endowments designed to enhance lagoon system function and values.

Resource Enhancement Program Project Mitigation and Phasing

Advanced resource enhancement activities are assigned specific mitigation credits based on the type of habitat creation, restoration, enhancement, and/or preservation resulting from individual REP projects, and/or for endowment of maintenance activities that sustain lagoon functions and values. Once established, mitigation credits would be available to mitigate any PWP/TREP transportation and/or community enhancement project impacts included in an active phase of the PWP/TREP Phasing Plan (i.e., 2010-2020, 2021-2030, 2031-2040, or 2041-2050). Where habitat mitigation credit exceeds the cumulative project impacts of any particular project phase, habitat mitigation credit would be made available to mitigate impacts associated with project implementation of the following phases.

Advanced resource enhancement activities also would include projects that facilitate and achieve ecological lift of corridor lagoon systems—specifically large-scale restoration plans for San Elijo Lagoon and Buena Vista Lagoon as well as hydraulic lift associated with bridge lengthening/optimization projects for San Elijo Lagoon, Batiquitos Lagoon, and Buena Vista Lagoon. The San Elijo and Buena Vista Lagoon Restoration Plans may establish a specific amount of wetland mitigation credits; however, REP projects that facilitate and achieve ecological/hydraulic lift of corridor lagoon systems through large-scale restoration plans and/or bridge lengthening/optimization are generally not subject to a specific credit calculation but nevertheless would result in significant enhancement of corridor resources through the REP implementation process and are considered appropriate for mitigating PWP/TREP project impacts.

Mitigation Site Assessments

Mitigation Site Assessments are required for all projects for which advanced resource enhancement would be implemented to establish mitigation credits based on the type of habitat creation, restoration, enhancement, and/or preservation proposed. These REP projects demonstrate a strong nexus for meeting the ecological needs in the North Coast Corridor while respecting the phasing requirements for transportation project development identified in the PWP/TREP, and therefore would be fully funded and implemented upon approval. Mitigation Site Assessments for the current package of REP projects are included in Appendix A of the PWP/TREP and have been submitted for separate review by the USFWS and other resource agencies.

Mitigation Site Assessments serve to formalize how the habitat creation, restoration, enhancement, and/or preservation activities proposed for each of the sites would conform to the REP goals and criteria. Mitigation Site Assessments also provide preliminary information to confirm mitigation credits to be established for each project and to assist in the preparation of final implementation plans that would be subject to further review through subsequent Notice of Impending Development (NOID), coastal development permit, or federal consistency submittals, and other permits required, as applicable.

I-5 North Coast Project Phasing and Impacts

In order to achieve the REP goal that mitigation would occur at the same time or before impacts and comply with CA SB 468, the *I-5 NCC Project* was been broken down into different phases for construction based on funding and interim projects that would result in congestion relief (*Table 3.1.9*). *Table 3.1.9* includes the I-5 NCC Project impacts included in the REP. The first phase of construction between 2010 and 2020 is broken into three different subprojects. Phase 1A would begin in 2014 and would include the ultimate widening of I-5 from just north of the

Lomas Santa Fe interchange to the Union Street overcrossing in Encinitas. This phase would include replacement and lengthening of the new bridge over San Elijo Lagoon. The creation of wetland from lengthening of the lagoon bridge would result in a net creation of 0.21 acre of state jurisdictional wetland; however, there are some impacts to Cottonwood and Moonlight Creeks between Santa Fe and Union Street as a result of the widening of the freeway placement of bioswales and impacts from trails resulting in a net impact of 0.53 acre of wetland in Phase 1A. The disturbed drainage of Cottonwood Creek, southeast of I-5 and Encinitas Boulevard, would have impacts from the new trails and the bioswales northwest of Encinitas Boulevard will result in a few sliver impacts to wetlands. There would also be impacts to 19.82 acres of sensitive upland habitat. The majority of the upland impacted would be along San Elijo Lagoon and between Manchester and Birmingham. Other projects in the first phase include extending one HOV lane in the median in each direction from the Union Overcrossing to SR-78 and completion of the ultimate widening of I-5 between La Jolla Village Drive and the 5/805 flyover. The braided ramps between Roselle and Genesee are not part of Phase 1C. The median widening would have minimal impacts to the outside of I-5 and would not impact the lagoon wetlands.

Table 3.1.9
PERMANENT CONSTRUCTION IMPACTS BY PHASE AND ESTIMATED CONSTRUCTION TIME PERIOD

Phase	Construction	Estimated construction time period	Impacts (Permanent cut/fill in acres)
1A	Ultimate widening from just north of Lomas Santa Fe to Union Street (includes Manchester DAR, bike paths, trails and new bridge at San Elijo)	2014-2017	Sens. upland = 19.82, Wetland* = 0.53
1B	1 NB/SB HOV in median, from Union to SR-78 interchange	2014-2017	Sens. upland = 1.06, Wetland* = 0.79
1C	Ultimate widening from La Jolla Village Drive to I-5 / I-805 Merge (includes Voight DAR and flyover over Peñasquitos Creek; not braided ramps at Genesee)	2015-2020	Sens. upland = 0.57, Wetland*= 0.13
2A	Ultimate widening from I-5 / I-805 merge to SR-56 (includes new Sorrento Valley Road bike/maintenance vehicle bridge, trails under I-5 at Carmel Creek, widening of I-5 at Carmel Creek, and trail under merge	2020-2022	Sens. upland = 0.99, Wetland create = 0.41
2B	Ultimate widening from SR-56 to Lomas Santa Fe (includes San Dieguito widening and bike paths/trails)	2020-2025	Sens. upland = 20.60, Wetland* = 3.59
2C	Ultimate widening from Union to Palomar Airport Road (includes Batiquitos bridge if not advanced listed as separate line item below)	2025-2030	Sens. upland = 3.28, Wetland* = 1.33

Table 3.1.9 (cont.)
PERMANENT CONSTRUCTION IMPACTS BY PHASE AND ESTIMATED CONSTRUCTION TIME PERIOD

Phase	Construction	Estimated construction time period	Impacts (Permanent cut/fill in acres)
2D	Batiquitos Bridge Replacement	2025-2030	Sens. upland = 9.91, Wetland* = 4.78
3A	Ultimate widening from Just north of Palomar Airport to SR-76 (includes Agua Hedionda and Buena Vista Bridges listed separately below.)	2030-2035	Sens. upland = 0.09, Wetland* = 0.85
3B	Agua Hedionda Bridge	2030-2035	Sens. upland = 0.68, Wetland* = 3.77
3C	Buena Vista Bridge	2030-2035	Sens. upland = 0.0, Wetland* = 1.14
3D	Roselle to Genesee Braided Ramps	2030-2035	Sens. upland = 5.57, Wetland* = 1.11
	TOTAL		Sens. Upland = 62.57 Wetland* = 17.6

*Wetland identifies wetland habitats that are State jurisdiction, not only ACOE jurisdiction

Phase 2 is broken into four projects. The replacement of the Batiquitos Bridge is identified separately, as it may be funded in the first phase to reduce staging impacts for bridge construction. Ultimate widening from the I-5 / I-805 merge to SR-56, from SR-56 to Lomas Santa Fe Drive, and from Union Street to Palomar Airport Road. Phase 3 would have the remainder of the widening projects to complete the corridor. Sensitive upland and net wetland impacts are identified for each subphase and the proposed timing of each subphase is identified.

No-Net Loss Mitigation Sites and Timing

Habitat creation, or substantial restoration where determined appropriate, would occur within the coastal zone to achieve no net loss for all wetland and sensitive upland habitat impacts at a minimum of one acre of creation/significant restoration for one acre of impact (*Table 3.1.10*). Seven potential mitigation sites have already been identified for mitigation within the North Coast Corridor (*Figures 3-1.7 and 3-1.8*). Six of these sites have either already been purchased, are being purchased, or the rights to complete the proposed mitigation on site have been purchased. The mitigation sites occur in five of the six lagoon watersheds crossed by I-5. Proposed timing of the mitigation is identified in *Table 3.1.*10 as included in the REP for *I-5 NCC Project* impacts. Wetland creation/establishment would be completed at the San Dieguito W19 Restoration Site and at the Hallmark Mitigation Site at Agua Hedionda. As identified on *Table 3.1.9,* Caltrans proposes to complete the majority of the mitigation in advance of project

impacts to minimize temporal loss and enhance upland habitat through the corridor, where feasible, and as approved by the resource agencies.

Table 3.1.10 summarizes the acreages of anticipated I-5 NCC-Project-only permanent impacts to wetlands and uplands and the corresponding acreages and locations proposed for no net loss mitigation, by watershed, with additional detail related to mitigation type (creation, restoration, preservation) and timing, shown on *Table 3.1.11* as included in the REP for *I-5 NCC Project* impacts.

Table 3.1.10
NO NET LOSS MITIGATION LOCATIONS FOR I-5 PERMANENT IMPACTS WETLANDS AND UPLANDS, BY WATERSHED

	Wetland Habitats		Upland Habitats	
	No Net Loss Creation		No Net Loss Creation/Restoration	
Watershed	**ACOE/State Wetland Impacts (acres)**	**Mitigation Site (acres)**	**Upland Sensitive Habitat Impacts (acres)**	**Mitigation site (acres)**
Peñasquitos	0.56/0.84	San Dieguito (0.84)	7.13	Deer Canyon (7.13)
San Dieguito	2.99/3.59	San Dieguito (3.59)	20.6	San Dieguito/ Dean (9.6/11.0)
San Elijo	0.50/0.09 net created	N/A	19.73	San Elijo Uplands (19.73)
Cottonwood	0.34/0.83	San Dieguito (0.83)	0.27	San Elijo Uplands (0.27)
Batiquitos	4.32/4.8	San Dieguito (4.8)	14.05	San Dieguito/ Dean (4.25/9.8)
Encinas	1.57/1.74	San Dieguito (1.74)	0.04	Hallmark (1.74)
Agua Hedionda	3.56/4.63	Hallmark (4.63)	0.7	Hallmark (0.7)
Buena Vista	0.81/1.14	San Dieguito (1.14)	0.00	N/A
Loma Alta	0.07/0.07	San Dieguito (0.07)	0.02	Hallmark (0.02)
San Luis Rey	0.07/0.07	San Dieguito (0.07)	0.05	Hallmark (0.05)
TOTAL	**13.79/17.62**	**17.62**	**61.58**	**61.58**

N/A: Not Applicable

Table 3.1.11
RESOURCE ENHANCEMENT PACKAGE NO NET LOSS MITIGATION ACREAGE AND TIMING

Mitigation/Enhancement Opportunities by Watershed		**Coastal Wetland Created**	**Coastal Wetland Restored**	**Coastal Wetland Preserved**	**Upland Created**	**Upland Restored**	**Upland Preserved**	**Begin Construction**	**Projected to Meet Criteria**
Creation/Restoration (No Net Loss) & Preservation		**Wetland (acres)**			**Upland (acres)**				
Los Peñasquitos	Deer Canyon II				14.6			Fall 2013	Winter 2019
	Dean Family Trust				20.8		1.5	Fall 2013	Winter 2019
San Dieguito	San Dieguito W19	48.4			9.6	19.8		Fall 2015	Winter 2022
San Elijo	Laser			0.02			4.4	Already Preserved*	
	Upland Creation around Lagoon				30			Fall 2014	Winter 2020
Batiquitos	La Costa						18.4	Already Preserved*	
Agua Hedionda	Hallmark	4.2	0.97	0.44	2.2	6.31	1.8	Fall 2014	Winter 2021
	Sub Total	**52.6**	**0.97**	**0.46**	**77.2**	**26.11**	**26.1**		

Table 3.1.11 (cont.)
RESOURCE ENHANCEMENT PACKAGE NO NET LOSS MITIGATION ACREAGE AND TIMING

Lagoon Restoration				
San Elijo	Restoration	Funding will be set aside for selected alternative as determined by the Final REP	Fall 2015	
	New PCH outlet at lagoon		If selected, Fall 2015, concurrent with restoration	
Buena Vista	Restoration	Funding will be set aside for selected alternative as determined by the Final REP	Timing depends on Planning and process	
Lagoon Management/ Endowment				
Regional Lagoon Maintenance Program		Batiquitos - $9.50/ cy [est.]; Peñasquitos - $3.90/ cy [actual]	2015 Endowment established	

* Sites already purchased and protected from development. Deed restriction and endowment would be established when site is accepted as mitigation.

Wetlands

The REP would provide mitigation for corridor-wide impacts, including impacts from construction of I-5 facilities, LOSSAN double tracking, and associated community enhancements. To achieve no net loss of wetlands for all corridor impacts, wetland creation is proposed to occur at the San Dieguito Lagoon W19 Site and at the Hallmark Sites located at Agua Hedionda Lagoon (*Figures 3-1.7 and 3-1.8*). A straight ratio approach is not proposed for wetland impacts associated with this project and other corridor projects due to the types of impacts, the opportunities for wetland creation, and opportunities to combine no net loss mitigation with other projects in the coastal corridor. The resulting package would ensure replacement of impacted habitat on an acre-for-acre basis, with corridor-wide enhancements of biodiversity and habitat value.

<u>San Dieguito Lagoon Restoration</u>

A feasibility study was completed for creation of at least 50 acres of coastal wetland at the W19 plot in the San Dieguito River Planning Area (*Figure 3-1.9*). Of the 50 acres, at least 48.4 would be available for REP projects. Approximately 1.6 acres are set aside for use by the land owners for prior mitigation requirements. Hydrodynamic and fluvial modeling were completed on several options that would create the minimum 50 acres of coastal wetland, up to 14 acres of brackish marsh, and would not adversely impact the existing SCE SONGS Restoration Project, or downstream sediment transport. As noted, approximately 48.6 acres of created coastal wetland would be used at a 1:1 ratio for no net loss of wetlands for the *I-5 NCC Project* as well as the LOSSAN double tracking project. The newly created brackish marsh would likely be used to mitigate for local streets and roads, including the City of San Diego's El Camino Real bridge replacement project. In addition to wetland creation, approximately 9.6 acres of sensitive upland would be created on the slopes of the wetland and 19.8 acres of upland would be restored on site. This restoration project is currently in the design and environmental review stage and additional options are being developed in conjunction with the resource agencies. The San Dieguito W19 Lagoon Restoration Site would have its own environmental documents and permits based on the restoration plan that is being developed. Based on the current schedule, this site is projected to begin construction in fall of 2015.

<u>Hallmark Mitigation Sites</u>

The Hallmark Mitigation Sites were purchased by Caltrans in late 2008 with preliminary agreement from the resource agencies that they would be reviewed and considered for habitat mitigation for the *I-5 NCC Project* (*Figure 3-1.10*). Creation/establishment of approximately 4.2 acres of coastal wetlands is proposed to occur on the Hallmark West sites. Approximately 1.3 acres of the property and 2.9 acres of an adjacent CDFG property would be graded to remove fill and establish new wetland habitat. The grading on CDFG property is needed to create tidal channels from the lagoon to the mitigation area. An additional 0.97 acre of brackish and riparian wetland would be restored on the Hallmark East site and 0.44 acre of wetland would be preserved on site. This wetland creation/establishment and restoration acreage would also be used as part of the no net loss wetland mitigation for the *I-5 NCC Project*. A plan for the mitigation activities on site is under development. Construction on both the west and east parcel of wetland and upland mitigation is projected to begin in fall of 2014.

Uplands

Compensatory mitigation for *I-5 NCC Project* impacts to baccharis scrub, coastal sage scrub, maritime succulent scrub, and maritime chaparral would be mitigated through creation or significant restoration activities to achieve no net loss. Several parcels discussed below have already been purchased and identified as appropriate upland mitigation areas. Native upland vegetation would be created/restored at the Dean Mitigation Site, at the Deer Canyon II (upper parcel), and on the slopes of the San Dieguito Lagoon W19 restoration. The Hallmark Mitigation Sites have areas where some coastal sage scrub can be created and other areas with existing disturbed/sparse coastal sage scrub that would be restored on site. In addition, several parcels have been purchased to preserve important linkage areas and habitats that were originally slated for development. Wetland and upland creation are currently underway on a portion of the Deer Canyon Mitigation Site in the Los Peñasquitos Lagoon watershed. An additional 14.6 acres of upland in a second parcel is in negotiation that would be used for creating additional coastal sage scrub habitat. The resource agencies provided preliminary agreement that purchase of the Laser property at San Elijo Lagoon, and the La Costa (Ayub) property at La Costa Boulevard would be reviewed and considered for habitat mitigation. Other parcels have also been identified; however, purchase has not yet been completed, or negotiations with the seller are ongoing. Caltrans and SANDAG continue to seek appropriate parcels for restoration and/or preservation of native upland habitats for mitigation. The parcels within Caltrans ownership are briefly described below.

<u>Deer Canyon II</u>

SANDAG and Caltrans propose to mitigate impacts to sensitive upland habitats associated with the project PWP/TREP by enhancing poor quality uplands habitat on the Deer Canyon II Mitigation Site, located in Deer Canyon adjacent to Deer Canyon Creek (*Figure 3-1.7*). The Deer Canyon Mitigation Site is within the coastal zone. The Deer Canyon II Mitigation Site consists of approximately 22.1 acres and is located adjacent to lands subject to a separate mitigation that is underway for the I-5 / Genesee Avenue Interchange Reconstruction Project, I-805 North Managed Lanes Project, I-805 / Carroll Canyon Road Extension and Direct Access Ramp, and double-tracking projects on the LOSSAN corridor (*Figure 3-1.11*).

The goal of the upland enhancement in Deer Canyon is to enhance non-native grassland habitat and manage the parcel as open space in perpetuity. The proposed enhancement and in-perpetuity management of the native uplands vegetation communities would:

- Provide wildlife habitat for the coastal California gnatcatcher and other native wildlife species habitat by removing non-native grassland and converting it to high quality coastal sage scrub and native grassland habitat
- Improve coastal sage scrub habitat and ecosystem continuity through connectivity between coastal wetlands and native uplands
- Stabilize slopes in Deer Canyon by converting non-native grassland habitat to more appropriate coastal sage scrub and native grassland habitat
- Provide a buffer between the riparian habitat and the surrounding land uses
- Preserve the enhanced areas in Deer Canyon as permanent open space

Portions of the upper parcel are already slated for restoration from non-native grassland and disturbed habitat to coastal sage scrub. The existing mitigation for the lower parcel and portions

of the upper parcel would likely be amended to include the additional 14.6 acres of restoration. Construction on this parcel is anticipated to begin in fall of 2013.

Dean Mitigation Site

The 23.1-acre property is immediately north of the City of San Diego's Crest Open Space and west of fallow agricultural fields that are being restored to coastal sage scrub by the SONGS San Dieguito Wetland Restoration Project (*Figure 3-1.12*). The Dean parcel is located within the City of San Diego Multi-Habitat Planning Area (MHPA). This parcel is dominated by disturbed habitat and disturbed baccharis scrub with a small area of coastal sage scrub/southern maritime chaparral in the southeastern corner of the parcel and some bare ground on the perimeter road. The coastal sage scrub/southern maritime chaparral habitat is dominated by lemonadeberry (*Rhus integrifolia*), chamise (*Adenostoma fasciculatum var. fasciculatum*), and black sage (*Salvia mellifera*), with wart-stemmed ceanothus (*Ceanothus verrucosus*), sea dahlia (*Coreopsis maritima*), Mohave yucca (*Yucca schidigera*), and scrub oak (*Quercus berberidifolia*). There are approximately 1.45 acres of this habitat above the road at the southeastern end of the parcel. It has very little disturbance except along the edges and is contiguous with the same habitat upslope in the Crest Open Space. Coastal California gnatcatcher also occurs on and adjacent to the site. This area would be preserved.

The main portion of the parcel is fallow agricultural field that is now either dominated entirely by exotic species or is dominated by coyote bush (*Baccharis pilularis*) with weedy species. Bare ground consists of the hard-packed cleared road on the southern and western ends of the parcel. Disturbed habitat on site is dominated by a thick layer of filaree (*Erodium spp.*) and black mustard (*Brassica nigra*), with scattered tamarisk (*Tamarix sp.*), tree tobacco (*Nicotiana glauca*), pampas grass (*Cortaderia sp.*), goldenbush (*Isocoma menziesii*), and ice plant (*Carpobrotus edulis*). Disturbed baccharis scrub is dominated by coyote bush with twiggy leaf plant (*Stephanomeria spp.*), deerweed (*Lotus scoparius*), filaree, acacia (*Acacia latifolia*), and Mexican elderberry (*Sambucus mexicanus*). There are approximately 0.85 acre of bare ground, 8.5 acres of disturbed baccharis scrub, and 12.3 acres of disturbed habitat on site.

Mitigation on site would include removal of all exotic species, planting approximately 20.8 acres with native species, and temporary irrigation. In addition, some check dams would be installed in an erosion rill to slow water flow and encourage sediment retention and plant growth. After approval of the mitigation plan, this site is planned for construction in the fall of 2013 (*Table 3.1.9*).

Hallmark Mitigation Sites

The Hallmark mitigation sites are located along the margins of the northeastern portion of Agua Hedionda Lagoon (*Figure 3-1.9*). The properties consist of three parcels of land; a western parcel and two adjoining eastern parcels. The western parcel (Hallmark West) is approximately 11.1 acres in size and is located between Park Drive and Agua Hedionda Lagoon. The other two parcels (combined Hallmark East) are between the lagoon and the neighborhoods along Via Hinton and Via Marta (*Figure 3-1.9*); these parcels comprise approximately 8.2 acres.

The Hallmark West parcel supports a combination of salt marsh vegetation, disturbed coastal sage scrub, and disturbed areas. There are approximately 1.57 acres of wetland habitat on site. There are also 0.9 acre of good quality coastal sage scrub, and 5.2 acres of disturbed and sparse coastal sage scrub and salt bush scrub that could be restored to good quality coastal sage scrub. The remainder is comprised of disturbed habitat and bare ground. Mitigation on

this site would enhance biological resources within the lagoon ecosystem and provide greater synergistic ecological benefits in association with the larger system; such as improved water quality, wildlife, and habitat continuity on the north lagoon shoreline. Upland mitigation would benefit coastal California gnatcatcher and south coast saltbush (*Atriplex pacifica*) through direct habitat enhancements and preservation through site access restrictions and long-term management.

The Hallmark East parcel lies between residential development and riparian habitat associated with Agua Hedionda Creek. The riparian habitat is owned and managed by the CDFG. The east parcel is 0.8 mile upstream of Agua Hedionda Lagoon. The mitigation site presents an opportunity to preserve the existing 0.7 acre of high quality coastal sage scrub, and restore 1.11 acres of disturbed coastal sage scrub. Slope treatments may be possible to create a habitat buffer between the existing residential land use and riparian habitat. An additional 2.2 acres of coastal sage scrub creation is possible in disturbed habitat at the base of the slope and on the ornamental slopes outside of the fuel modification zones for the adjacent homes. Fuel modification areas and deed restricted areas would not be restored or counted toward total restoration and enhancement. As stated earlier, construction on the west parcel is anticipated to begin in the fall of 2014 and construction on the eastern parcel would also be expected at the same time.

Laser Mitigation Site

The Laser mitigation site is located immediately west of the viewpoint on southbound I-5, and north of Manchester Avenue (*Figure 3-1.7*). Diegan coastal sage scrub (3.9 acres), coastal bluff scrub (0.5 acre), non-native grassland (0.16 acre), bare ground (0.11 acre), and ornamental (0.21 acre) communities were identified on the two parcels comprising the Laser site (*Figure 3-1.13*). In addition, a small area of disturbed salt marsh (0.02 acre) and developed habitats were observed adjacent to Manchester Avenue. Two territories of threatened coastal California gnatcatcher were observed, one on each parcel. Both of these parcels have high quality habitat that supports six sensitive plant species. The site presents an opportunity to preserve the existing native communities through site access restrictions and long-term management. The site is already owned by Caltrans and once approval for use as mitigation for I-5 is received, the parcel would be deed restricted and likely transferred to the San Elijo Lagoon Conservancy with an endowment for long-term maintenance and management.

La Costa (Ayub) Mitigation Site

The La Costa (Ayub) mitigation site is a 20.6-acre parcel located east of I-5, south of La Costa Avenue, and east of Piraeus Street (*Figure 3-1.8*). La Costa Avenue separates the site from Batiquitos Lagoon. The parcel was identified as having high to very high habitat values in the draft Multiple Habitat Conservation Plan (MHCP) for coastal northern San Diego County and is located within a Biological Core Linkage area. The preservation area abuts the Carlsbad Habitat Conservation Plan (HCP) core area #8 that comprises Batiquitos Lagoon. The lagoon is owned and managed by CDFG.

Other open space lands are present south and east of the proposed preservation parcel at Batiquitos Lagoon. These open space areas are located on slopes and canyons that topographically form the southern boundary of Batiquitos Lagoon (*Figure 3-1.14*). The slopes provide linkages to inland areas associated with Encinitas Creek and other drainages that flow into the lagoon.

Diegan coastal sage scrub (15.0 acres), chaparral (both southern maritime chaparral and chamise chaparral, 3.38 acres), and disturbed habitat (0.97 acre) communities were identified on the parcel. The parcel generally has good habitat, with excellent habitat found on the top of the mesa. It provides habitat for sensitive plants as well as the threatened coastal California gnatcatcher. There is little weed invasion in most places and minimal effort would be needed to fence this parcel to control access and preserve the habitat in place. The site is already owned by Caltrans and once approval for use as mitigation for I-5 is received, the parcel would be deed restricted and transferred to another entity with an endowment for long-term maintenance and management.

San Elijo Lagoon Uplands

Several areas within the San Elijo Lagoon Reserve have been identified by the San Elijo Lagoon Conservancy as needing restoration. These are areas dominated by non-native grasses and forbs or by eucalyptus woodland in areas otherwise surrounded by high quality coastal sage scrub and wetland habitats. These areas have been briefly surveyed to determine potential for restoration activities. Further information is needed to develop a template for restoration of one or more of the sites. Other parcels in the vicinity of San Elijo may also become available that are better candidates for upland restoration. Use of these sites as mitigation would depend on agreements with landowners and possible purchase of other more suitable properties. Therefore, creation of coastal sage scrub on these sites is not projected until fall of 2014.

Summary

Caltrans proposes to create, restore, and preserve the habitats identified for these six sites where property rights have been secured and to pursue other locations near San Elijo Lagoon. The creation and restoration of habitats on these sites would satisfy the no net loss compensatory mitigation requirement for the *I-5 NCC Project* and for LOSSAN double tracking projects. Although the REP covers all corridor impacts as part of the PWP/TREP, this Supplemental Draft EIR/EIS addresses mitigation relevant and specific to impacts identified for the *I-5 NCC Project*. These upland sites all currently support coastal California gnatcatchers either on or adjacent to the sites. The tidal wetland creation at the W19 and Hallmark sites would contain salt marsh habitat that would potentially support light-footed clapper rail, Belding's savannah sparrow and a number of other species and would enhance the existing habitat surrounding the sites. Assuming all of the sites are approved as mitigation for the *I-5 NCC Project* and/or LOSSAN, mitigation and monitoring plans would be developed and submitted for review and approval and all of the sites could be in construction by fall of 2015. Upland sites should achieve goals within five years or less and wetland sites should achieve goals within five to six years. Regardless, the majority of mitigation would be in construction or completed prior to any impacts from construction of the *I-5 NCC Project*.

Credit Establishment and Accounting

Habitat Creation and Restoration-No Net Loss Requirement

Mitigation credits available for no net loss compensatory mitigation are based on the number of acres existing on site versus the goal for the restoration of the site. The number of credits available for each habitat type on the proposed mitigation sites would be finalized pursuant to final restoration plans to be reviewed by the resource agencies.

The REP includes a performance-based crediting and release system to ensure mitigation credits can be available for PWP/TREP project impact mitigation at incremental and measurable stages. The performance-based crediting and release system would ensure that resource enhancement activities are advanced to the maximum extent possible, while achieving a balance of transportation and community enhancement projects in each phase. Under these procedures, mitigation credit would be released at the time the banking instrument (BEI) is signed with the conservation easement, with additional percentages of credits released after the grading and planting is complete (as built), and finally in accordance with performance standards identified in final implementation plans and successfully met on an annual basis. A proposed rate of release based on other mitigation banks is provided below.

BEI/Conservation Easement: 15%
Grading, Construction, and Hydrology (As Built): 25%
Mitigation Monitoring Performance Standards, Meets 20%: 15%
Mitigation Monitoring Performance Standards, Meets 40%: 15%
Mitigation Monitoring Performance Standards, Meets 60%: 15%
Mitigation Monitoring Performance Standards, Meets 80%: 10%
Final Monitoring/Inspection Meets Final Standards: 5%

Habitat Preservation

Temporary construction-related impact areas would be revegetated and returned to pre-existing conditions, or better. Mitigation credits for the temporal loss of habitat from temporary, construction-related impacts are based, in part, on acquisition of parcels containing existing high-value habitat areas within the coastal zone area and where permanent preservation of habitat is ensured. These parcels have already been purchased and are preserved. The credits would be finalized pursuant to final habitat management plans to be reviewed by the resource agencies, and the credits released for mitigation once the sites are deeded to an approved local land management agency that is acceptable to the resource agencies. Habitat preservation credits would mitigate for temporary and temporal construction impacts resulting from PWP/TREP project impacts by ensuring long-term preservation of upland ESHA and/or wetland resources in advance of construction impacts occurring.

Lagoon Restoration

In addition to establishing/restoring habitat for compensatory mitigation for permanent wetland and upland impacts, the REP projects would also facilitate and achieve ecological lift of corridor lagoon systems by providing funding and facilitating large-scale restoration plans for San Elijo Lagoon and Buena Vista Lagoon. Organizations representing each of these lagoons are developing, conducting environmental review of, and permitting, their own restoration plans. The channel dimensions necessary to complete the proposed restoration of these two lagoons have been incorporated into the I-5 bridge designs. One alternative of the SELRP includes the construction of a new lagoon inlet and additional rail bridge. The San Elijo and Buena Vista Lagoons Restoration Plans may potentially establish a specific amount of wetland mitigation credits; however, credits may not be required by all resource agencies. The large scale restoration projects would result in significant enhancement of corridor resources through the REP implementation process, and are therefore considered appropriate for mitigating PWP/TREP project impacts. The ecological lift that would occur as a result of implementing these lagoon restoration plans would serve as mitigation for all PWP/TREP project impacts, including temporary impacts, shading impacts, indirect impacts, temporal wetland impacts, and

cumulative impacts within the corridor. Credits should be released upon approval of funding for the restoration projects.

Lagoon Management/Endowments

Mitigation credits would be established by contributing funding through the PWP/TREP Phasing Plan process to endow a regional lagoon maintenance and management program. This REP project could include an endowment to be put into an account and managed to complete maintenance dredging, weed eradication and control, etc. The amount of endowment is based on maintenance costs to date and a reasonable calculated rate of interest on the account that would provide for maintenance funds in perpetuity. The endowment would be managed by an oversight committee to be formed of resource agency personnel and others similar to the makeup of the EMP Working Group. Mitigation credits could be based on a calculation that determines the percentage of existing wetland and/or upland habitat that would be sustained and/or enhanced through maintenance activities, which may include but not be limited permanent inlet maintenance, management of sedimentation through lagoon channel dredging, improved tidal flushing, and wetland and upland habitat enhancement through invasive weed control, replacement plantings, etc. Mitigation credits would be released for PWP/TREP project impact mitigation at the time funds are deposited in the regional lagoon maintenance and management program endowment.

Hydraulic Lift Lagoon Bridge Lengthening/Optimization

REP projects involving lagoon bridge lengthening and optimization would result in benefits to water quality, tidal range, flood control, groundwater recharge, and wetland habitats and species, which occur concurrent with bridge replacement projects. Lagoon optimization studies were completed for San Elijo, Batiquitos, and Buena Vista Lagoons to inform the design of the I-5 and LOSSAN railroad bridges to optimize tidal flow, fluvial flow, and sediment transport. The *I-5 NCC Project* design for San Elijo, Batiquitos, and Buena Vista Lagoon bridges has adopted the proposed channel dimensions, and designed bridges with lengths that accommodate the optimized channel. Optimized bridge lengths were also identified for Pacific Coast Highway and inlets within San Elijo and Buena Vista lagoons to maximize system benefits. The studies conclude that constructing longer and/or deeper channels and crossings at these lagoon locations would improve water quality, increase the quality of coastal wetland habitat, increase tidal range, decrease flood impacts, and improve the overall health and function of the lagoon systems. These REP projects are not subject to a specific credit calculation, however, because optimized bridge lengths have been identified as necessary for the success of proposed lagoon restoration projects at San Elijo and Buena Vista lagoons, and construction of identified optimized bridges is intended to specifically enhance coastal resources. They are a contributing mitigation element for all PWP/TREP project impacts (particularly for temporary impacts, potential temporal wetland impacts, and water quality). Please see more detailed discussion of these lagoon crossings in *Section 3.1.2* of this document.

Resource Enhancement Program Project Maintenance and Monitoring

As identified in the Mitigation Site Assessments, monitoring requirements for each REP mitigation project would be conducted according to final habitat management plans (HMPs) and/or restoration plans. In addition, the PWP/TREP Implementation Plan includes a monitoring and reporting program which would provide a yearly assessment and summary of information and updates to the Implementation Framework to document projects and associated mitigation

requirements completed, and to assess cumulative phase project impacts, benefits, and available resource mitigation credits for future project and/or phase implementation.

Mitigation Site Assessments identify anticipated maintenance activities that would be necessary for individual mitigation projects, and an HMP would be prepared to further define the long-term management responsibilities to maintain the coastal resources that are established through the REP mitigation projects. Each HMP would identify a resource agency-approved management entity to assume long-term management responsibilities. Funds for long-term management would be provided by SANDAG/Caltrans and placed into a non-wasting endowment. Endowment funds would be established using a Property Assessment Report that is based on the approved HMP.

Supplementing REP Opportunities – Mitigation Contingencies and Future Opportunities

Should a circumstance arise in which a yearly monitoring report determines unanticipated resource impacts have occurred from project construction, or are greater than project construction impacts approved for any particular project phase identified in the PWP/TREP, SANDAG/Caltrans would be responsible for initiating additional mitigation projects. These procedures may also be initiated should SANDAG/Caltrans, in consultation with stakeholders and resource agencies, determine that a new resource enhancement opportunity has been identified that meets the category and evaluation criteria identified in the REP, funds are available, and incorporation into the REP and prioritization within the PWP/TREP Phasing Plan is therefore warranted.

Each no net loss mitigation site would have its own funding and mitigation and monitoring plan with remedial measures in the event the site is not attaining its goals. If unanticipated resource impacts occur, and cannot be corrected on site, SANDAG/Caltrans would identify and implement mitigation at another location. In most cases, the mitigation site can be corrected on site through additional grading, planting, weeding, or soil amendment. In addition, funding could be shifted between projects if a project proposed now is not carried forward for some reason.

3.1.4 Regional Benefits

As noted in the discussion of avoidance, minimization, and/or mitigation measures in *Section 3.1.3*, the REP proposes comprehensive corridor lagoon restoration, over and above mitigation components necessary to meet the requirement of no net loss of habitat. Additional out-of-kind habitat restoration and integrated lagoon ecosystem restoration and enhancements proposed in the REP would provide significant ecological lift to the lagoon systems.

As previously noted, lagoon optimization studies were completed to ensure the project is designed to improve tidal flow, fluvial flow, and sediment transport. The studies identify the channel configurations to optimize both lagoon hydraulic functions and construction feasibility. The longer and/or deeper channels and lagoon crossings proposed as part of the *I-5 NCC Project* would improve water quality, increase the quality of coastal wetland habitat, decrease flood impacts, and improve the overall health and function of the lagoon systems.

The REP offers a unique opportunity for a comprehensive approach to restoring and enhancing the lagoon ecosystems. Specifically, in addition to benefits for individual lagoon habitats, species, and hydraulic function as outlined in *Section 3.1.3*, a number of regional benefits would also be achieved. As noted in *Section 3.1.1*, the mitigation and enhancement features described in this chapter comprise a (substantial) part of the PWP/TREP, which addresses all

impacts and proposed mitigation for the *I-5 NCC Project*, the LOSSAN projects, and a number of identified local agency projects. Compilation of all North Coast Corridor projects into a single mitigation and enhancement effort ensures that the most accurate assessment of total potential impacts is being made and that the best overall options for mitigation of that total effect are being evaluated. Addressing impacts on this corridor-wide basis would provide greater regional benefit than mitigating on an individual project basis as these projects independently move forward over the next few decades. This is because: (1) mitigation for all included projects would be implemented in the near-term rather than as impacts occur (which would result in some mitigation being delayed for substantial periods of time); (2) areas proposed to be acquired for habitat preservation, restoration, and/or enhancement are more likely to be available in the near-term (i.e., such areas could be subject to development or other uses that would preclude mitigation if they are not secured in the near-term); and (3) implementing mitigation in the near-term would result in substantial additional time during which functional and connected habitat areas mature and are available for use by associated flora and fauna, including sensitive species. Specifically, then, benefits would include the following:

- Immediate and permanent set aside of existing (or appropriate for restoration) habitats would occur. Because a number of these habitats support sensitive floral and faunal species, associated benefits to activities such as breeding, foraging, and nesting would also be realized, thereby improving the overall conditions for these species on a regional basis.

- The corridor-wide approach to mitigation would provide greater regional benefits to coastal resources than a more traditional site-specific approach. Specifically, this conclusion is based on considerations including the fact that potential conflicts between in-place habitat preservation/restoration sites and impacts from subsequent development proposals would be minimized or avoided.

- A number of new pedestrian/bicycle trails and connections with existing trails/corridors addressed in the PWP/TREP, as well as project-implemented wildlife corridor improvements, would provide potential for recreational and wildlife movements between different areas such as lagoons, habitats, and recreational sites, with associated regional benefits for wildlife (e.g., enhanced gene flow between populations) and recreationalists (e.g., opportunities for unhindered access between coastal and/or inland sites).

- Implementation of the PWP/TREP on a corridor-wide basis would allow enhanced opportunities to implement water quality treatment/enhancement, as opposed to a traditional project-specific approach. Specifically, BMPs (particularly design pollution prevention and treatment measures) can be more effectively designed to address issues affecting entire watersheds (rather than individual drainages or water bodies), thereby providing a more regionally based approach to pollutant control/treatment and related ecosystem benefits.

- The corridor-wide approach would improve opportunities for regional air quality improvement, through efforts such as providing more extensive, and connected, facilities for HOV use, ride-sharing, links to public transportation, and alternative transportation (e.g., connected bicycle lanes, as previously described).

Table 3.1.1
LOS PEÑASQUITOS LAGOON BRIDGES OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals	Bridge Options	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost [j]
<u>Concerns</u> -Sedimentation/siltation -Excess freshwater inputs/increased salinity -Lack of permanent tidal influence -Invasive plant species -Acoustic impacts from pile driving (during bridge footing construction) on both avian and fish species <u>Special Status Species</u> -Belding's savannah sparrow -Western snowy plover (Critical Habitat) -Light-footed clapper rail -California gnatcatcher -Tidewater goby surveys are recommended by USFWS -Wandering skipper surveys are recommended by USFWS <u>Constraints</u> -LOSSAN Railroad Bridge Crossings (CC-059-09; approved 2/9/11) -Highway 101 Crossing (approved/updated in 2005) -Urban infringement <u>San Diego LCP Goals</u> -Preserve as open space; encourage restoration -Minimize disturbance of wildlife; avoid blockage of tidal action -Incorporate drainage control measures -Remove/relocate public utility/facility projects from lagoon, as feasible	**No Action (Existing I-5 Bridge over Los Peñasquitos Creek, Soledad Creek, and Carmel Creek)** ***Assumes no new I-5 crossings**	Los Peñasquitos Creek: multiple existing facilities and roadways Soledad Creek: multiple existing facilities and roadways Carmel Creek: 421 ft long 179 ft wide	Los Peñasquitos Creek has existing rip rap; Soledad Creek is concrete channel; Carmel Creek has no existing channel protection	0 ac existing I-5 roadbed fill at all bridge crossings; long bridge spans located outside of active channels, except where columns occur	The lagoon is a salt marsh system with no permanent tidal influence reaching the I-5 crossings at the easternmost boundary of the lagoon	463 ac existing salt marsh system with no permanent tidal influence reaching any of the I-5 crossings	Sloped abutment and area under existing bridges presently used by wildlife	100-year flood events not contained within existing floodplain boundary at Carmel Creek only; freeboard deficiency noted under existing conditions (see SLR); risk of inundation under Q100 storm events considered short duration. Flood events at Los Peñasquitos Creek and Soledad Creek contained within existing floodplain boundary	Bridges are not a noted constriction point subject to surface water flood flows and associated erosion/ scour. Low potential for tidal erosion/scour near bridge abutments due to minimal/no tidal influence at I-5 crossings	Some sediment is trapped in detention basin upstream of I-5. Remaining sediment trapped in system/ shoreline sand supply limited due to limited tidal flushing. Maintenance required to open inlet annually	Greater than -0.7 ft freeboard deficiency noted under 'high' projection of SLR estimates in year 2100 at Carmel Creek; risk of inundation under Q100 storm events considered short duration and adaptation strategies feasible. All other I-5 crossings have freeboard to pass flows (3-35+ ft)	N/A
	Approved Railroad Single-track Replacement Bridge Crossings (3 total) (see CC-059-09)	B246.1: 280 ft long 23 ft wide B246.9: 196 ft long 23 ft wide B247.1: 84 ft long 23 ft wide	No change to existing conditions; replacement bridges would be in-line with existing trestle bridges	Removal of 2,520 sf of earthen railroad berm and 147 sf of railroad pilings	No change to existing conditions; replacement bridges would be in-line with existing trestle bridges and continue to present a constraint to flows within the lagoon	No change to existing tidal range; reduced wetland fill from removal of railroad berm and pilings	No change to existing conditions; no designated public trails approach or cross over/under the railroad	No change to existing conditions; replacement bridges would be in-line with existing trestle bridges and continue to present a constraint to flows within the lagoon	Erosion protection around the bridge abutments provided by Armor Flex; allows water to permeate into the ground and wetland plants to grow within the preformed openings between the blocks	No change to existing conditions; tidal velocities insufficient to transport sand supply to lagoon mouth	No known change to existing conditions	N/A
	Proposed I-5 Bridge 1 (8+4 Buffer-LPA) ***Carmel Creek I-5 bridge widening 3 ft wider to west on south bound lanes**	**421 ft long 194 ft wide**	**Channel width: ~415 ft** **Channel bottom: Varies** **Riprap or armoring on southern abutment by proposed trail**	**0 ac add'l roadbed fill; potential for 100 sq ft of new column fill** **0.03 ac add'l shaded open water from widened bridge**	**The lagoon is a salt marsh system with no permanent tidal influence reaching the I-5 Carmel Creek crossing at the easternmost boundary of the lagoon**	**No change to existing tidal range, or its effects on wetland or upland habitats**	**New, wider 10 ft bench at south bridge abutment for wildlife, with new pedestrian/ bike trail connection under the bridge connecting to Carmel Valley and Sea-to-Sea trails. Existing 8 ft bench on northern abutment will remain as is**	**100-year flood events not contained within existing floodplain boundary; noted bridge freeboard deficiency -0.7 ft of freeboard; risk of inundation under Q100 storm events considered short duration and adaptation strategies feasible**	**Low potential for tidal erosion/scour near bridge abutments due to minimal/no tidal influence at I-5 crossing**	**No change to existing conditions**	**Greater than -0.7 ft freeboard deficiency noted under 'high' projection of SLR estimates in year 2100 (requiring 4.5 ft of SLR); risk of inundation under Q100 storm events considered short duration and adaptation strategies feasible**	**Baseline**

Table 3.1.1 (cont.)
LOS PEÑASQUITOS LAGOON BRIDGES OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals	Bridge Options *	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/ 30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential SLR Constraints [i]	Construction Cost [j]
Cont. Del Mar LCP Goals -Develop pedestrian trails and bike paths -Ensure protection of wetlands and ESHA Restoration Efforts -Dredging/sedimentation control -Reduce urban/landscape runoff -Maintain tidal influence at lagoon mouth -Control/remove invasive plant species Monitoring/Management -Annual maintenance dredging	**Proposed I-5 Bridge 2 Sorrento Valley Road Bike Bridge (8+4 Buffer-LPA)** ***Carmel Creek culvert replaced with bridge**	**443 ft long 36 ft wide**	**Channel width: ~415 ft** **Channel bottom: Varies** **Riprap on abutments will likely be required - TBD**	**Reduced roadbed fill after culvert replaced by new bridge** **Added 0.44 ac partially shaded open water created from removal of culvert fill outside of stone column footprints**	**No tidal influence reaches the proposed bike bridge; no change to tidal range**	**No change to existing tidal range, or its effects on wetland or upland habitats** **Creation of approximately 0.44 ac of partially shaded open water from removal of culvert fill**	**New bridge to replace existing culvert at Sorrento Valley Road, which is only open to pedestrian/ bike use. Northern abutment of bridge will have an 8 ft bench that connects to the existing bench under I-5**	**100-year flood events contained within existing floodplain boundary over Carmel Creek; replacing culvert with bridge reduces floodplain elevation upstream by 4.4 ft. 3.2 ft of freeboard at bike bridge**	**No potential for tidal erosion; existing surface water flow constriction at Sorrento Valley Road culvert removed by new bridge spanning floodplain**	**Removal of culverts and construction of bike bridge may facilitate some sediment transport downstream of I-5**	**3.2 ft freeboard for bike/ped bridge under existing bridge; should existing water levels increase by 4.5 ft with 'high' projection of SLR estimates in year 2100 there could be a -1.3 ft freeboard deficiency. However, tides do not currently reach bridge**	**Baseline**
	Proposed I-5 Bridge 3 (8+4 Buffer-LPA) ***HOV connector bridge over Soledad and Los Peñasquitos creeks**	**3,609 ft long 60 ft wide**	**New bridge over Los Peñasquitos Creek and Soledad Creek would continue to span the active channels, with proposed bridge columns located outside of the creeks; no new shoreline protection required**	**0 ac add'l roadbed fill anticipated at HOV connector bridge over Los Peñasquitos or Soledad Canyon creeks; long bridge span, columns located outside of creeks**	**No tidal influence at these locations. No change to tidal range of lagoon from these proposed bridges**	**No change to existing tidal range, or its effects on wetland or upland habitats**	**Possible 16 ft bench at south bridge abutment, with new pedestrian/ bike trail connection under the bridge from Los Peñasquitos Creek to Sorrento Valley Road depending on clearance under I-805; north bridge abutment maintained as wildlife corridor with 2:1 slope**	**100-year flood events contained within existing floodplain boundary over Los Peñasquitos Creek; no change to floodplain or waterway elevations. At Soledad Creek, new columns would minimally increase upstream floodplain elevation by 0.4 ft. 35+ ft of freeboard noted at both bridges**	**No potential for tidal erosion at either bridge as they are located too far upstream for any tidal impacts. New bridges would continue to span floodplain at Los Peñasquitos Creek, with proposed bridge columns located outside of the floodplain**	**Same as existing or, dependent on lagoon restoration, proposed bridge could facilitate improved sediment transport to shoreline**	**24.0 to 30.6 ft freeboard (range at Soledad and Los Peñasquitos creek crossings) maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)**	**Baseline**
	Proposed LOSSAN Double-track Bridge Crossings (3 total)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

NOTES:

a Bridge design features for I-5 options are described in detail within the Draft EIR/EIS. Railroad single-track bridge replacements are discussed within the CCC staff report for approval of a federal consistency certification (CC-059-09), whereas LOSSAN double-track bridge design features are under consideration. No proposed bridge would involve the construction of new or expanded shoreline protective devices beyond existing abutment protection structures, if required.

b Wetland fill consists of road bed fill supporting the bridge span. Bridge support structure footprint within the lagoon channel is calculated separately, and would only be required at the proposed culvert-to-bridge replacement over Carmel Valley Creek (for the Sorrento Valley Road bike trail).

c Maximum tidal range is the difference between the lowest observed water level and the highest observed water level. The greater the range, the lower the tidal muting effect within the lagoon system. Due to existing downstream constraints, there is no permanent tidal influence at the I-5 crossing.

d Due to the current constraints and north-south transecting facilities, Los Peñasquitos Lagoon has developed into a salt marsh with increasing freshwater influences and no permanent tidal influence. Dredging activities have led to breaching of existing ocean inlet to support lagoon water quality.

e All north-south trending transportation facilities, including I-5, LOSSAN, and Highway 101 currently act as a wildlife barrier to east-west movement. All designs for the proposed I-5 widened or new replacement bridges may include a bench at the abutment to facilitate wildlife movement.

f Drainage and floodplain impacts are expected to be negligible, which would in turn minimize potential adverse impacts associated with alteration and channelization of floodplains and associated erosion. Hydraulic Studies conclude that 100-year flood events would continue to be contained within the existing floodplain boundaries for each bridge, and therefore would not result in substantial impacts to on-site or off-site locations associated with drainage and flooding.

g There is no (or minimal) potential for channel erosion or scouring at the bridge abutments to occur due to lack of tidal influence and distance from the ocean inlet at I-5 crossings. Channel erosion/scouring at the LOSSAN bridge crossings is discussed in CC-059-09.

h Los Peñasquitos Lagoon is managed under an existing sediment control program. No sedimentation is transported between the Los Peñasquitos or Carroll Canyon creeks on the far east of the system to the Pacific Ocean, which is naturally closed to tidal influence as a result of existing downstream constraints at the railroad bridge crossings and minimally at the Highway 101 bridge crossing (this bridge was redesigned and constructed in 2005 to reduce fill and maintain tidal influence to the extent feasible).

i All of the proposed bridge designs would address potential impacts associated with the exacerbating effects of SLR on channel erosion, storm surge and flooding; by siting and designing the bridge support structures in a manner that minimizes the frequency at which structures could be subject to wave action, tidal inundation, and flooding. Furthermore, due to the distance from the ocean inlet and lack of tidal influence at the I-5 bridge crossings, SLR is not anticipated to result in substantial adverse effects on the bridge structures.

j Construction costs associated with the proposed new or widened I-5 bridges are anticipated to be provided through either Capital and/or Environmental Mitigation Program (EMP) program funds; further discussions are anticipated to determine appropriate use and allocation of available funds.

Table 3.1.2
SAN DIEGUITO LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS**

Lagoon System Concerns/ Constraints/Goals	Bridge Options	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)[l]	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost [j]
Concerns -Sedimentation/Siltation -Sensitive bird species/island maintenance -Maintenance of open tidal inlet -Eelgrass Special Status Species -Belding's savannah sparrow -Light-footed clapper rail -Western snowy plover (Proposed Critical Habitat) -California least terns -California gnatcatchers -Tidewater goby surveys are recommended by USFWS -Wandering skipper surveys are recommended by USFWS Constraints -Railroad Bridge Crossing -Coast Highway Crossing -Jimmy Durante Boulevard -Upstream dams (e.g., Lake Hodges Dam) San Diego LCP Goals -Preserve floodplain, open waters of the lagoon and river, wetlands, marshlands and uplands; encourage restoration -Enlarge to enhance plant and animal habitats, and to create a sufficient tidal prism to ensure adequate water circulation and to keep the mouth of the river open -Minimize disturbance of wildlife -Incorporate drainage control measures Del Mar LCP Goals -Prohibit impediments to flow of floodwaters and restoration of tidal function -Establish trails/bike paths that link coastal recreational areas -Ensure protection of wetlands and ESHA; improve for use as a wildlife preserve	**No Action I-5 (Existing Bridge)**	650 ft long 179 ft wide	Main Channel Bottom: 140 ft Flow Area under bridge: 575 ft Channel Depth: -4.0 NGVD Riprap on abutments and along north side of channel; no riprap on south side of channel	30.25 ac existing roadbed fill (0 ac additional roadbed fill) 0.75 ac existing shaded open water (0 ac additional shaded open water)	Existing I-5 bridge accommodates current and ongoing lagoon restoration and does not act as a constriction point to tidal prism due to long bridge span	No change to existing/restored wetland and intertidal habitats; restoration efforts occurring outside of bridge crossing/highway ROW	Paved trail located on the northern I-5 bridge abutment; large expanse under existing bridge may be used by wildlife	Relatively flat, established FEMA floodplain; existing bridge is a constriction point for upstream surface water flood flows although all flows can be contained within the 100-year floodplain	I-5 bridge a constriction point for upstream surface water flood flows and associated erosion/scour. Low potential for tidal erosion/scour near bridge abutments from ocean inlet as threshold transport velocity on either side of the bridge is extremely low	Sediment trapped in system/shoreline sand supply limited; however, with restoration efforts, tidal flows from the ocean inlet are now uninhibited. Restoration project designed to keep sediment suspended until it reaches the beach.	1.5 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (requiring 4.5 ft of SLR); floodplain elevation may be lowered with ongoing restoration efforts	N/A
	No Action Railroad (Existing Single-track Bridge)	1,038 ft long 14 ft wide	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	N/A
	Proposed I-5 Bridge (8+4 Buffer-LPA) ***Widened only**	**650 ft long 258 ft wide**	**Same as existing, or accommodates current and ongoing lagoon restoration. No riprap will be placed on south side of channel.**	**2.94/3.64 ac add'l roadbed fill in ACOE WUS/State wetland** **0.42/0.75 add'l shaded ACOE WUS/State wetland**	**No change to existing conditions; accommodates current and ongoing lagoon restoration. With lagoon restoration, introduction of new tidal prism further supported by the existing bridge span located outside of active tidal channel**	**No change to existing tidal range, or its effects on wetland or upland habitats east of I-5**	**No change to existing corridors/trails needed**	**100-year flood flows based on FEMA worst case with a constant channel depth, spring tides, and storm wave run-up would have 0.7 ft freeboard under bridge. Modeling by Chang and Moffat and Nichol identified at least 6 ft of freeboard for 100-year flood with more realistic modeling inputs and including recent restoration activities**	**No change to existing conditions; accommodates current and ongoing lagoon restoration**	**No change to existing conditions**	**1.5 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (requiring 4.5 ft of SLR) based on Chang modeling; floodplain elevation may be lowered with ongoing restoration efforts**	**Baseline**

Table 3.1.2 (cont.)
SAN DIEGUITO LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS**

Lagoon System Concerns/ Constraints/Goals	Bridge Options	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)\	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost [j]
Restoration Efforts (Began in 2006) -Excavation for creation of new intertidal wetlands; lowering of floodplain elevation -Development of native upland habitat/bird nesting areas -Creation of storm water management basin -Public access and interpretation component -San Dieguito River Valley Planning/ Restoration Site Monitoring/Management -SCE Maintenance dredging for open inlet	**Proposed LOSSAN Railroad Bridge (Double-track)**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**	**TBD**

NOTES:

** Removal of all fill for the I-5 bridge crossing is not considered due to the high profile of the road, the length of the current bridge is much longer than the channel, and the current SCE restoration project was designed assuming the existing I-5 bridge would remain in place and be widened.

a I-5 bridge design features are described in detail within the Draft EIR/EIS; LOSSAN replacement bridge design features are under consideration. The proposed I-5 bridge would not involve the construction of new or expanded shoreline protective devices beyond existing abutment protection structures, if required.

b Wetland fill consists of I-5 road bed fill supporting the bridge span piers within the active tidal channel (3 of 10 total piers).

c Maximum tidal range is the difference between the lowest observed water level and the highest observed water level. The greater the range, the lower the tidal muting affect within the lagoon system. With current and ongoing restoration efforts, the tidal prism is expected to increase up to 13 percent. The existing and proposed (wider) I-5 bridge would not constrict the tidal prism as the longer span is located outside of the active tidal channel.

d Due to the current constraints and north-south transecting facilities, San Dieguito Lagoon has developed into a salt marsh with increasing freshwater influences and no permanent tidal influence. Dredging activities have led to breaching of existing ocean inlet to support lagoon water quality. The restoration and preservation of disturbed wetland and upland (coastal sage scrub) habitats associated with the San Dieguito River Planning/Restoration sites (San Dieguito MOU/JPA and Dean Family Trust parcels) would result in additional habitat improvements within the lagoon system, and provide offsetting mitigation for potential impacts that would result from the proposed I-5 and LOSSAN replacement bridges throughout the North Coast Corridor. Approximately 50 ac of wetland creation, 78.6 ac of coastal sage scrub creation, and 1.5 ac of upland preservation are anticipated at the combined San Dieguito River Planning/Restoration sites.

e There is currently a large amount of open area outside of the active channel that can accommodate wildlife movement, and there is a pedestrian/bike trail located on the existing north abutment at the I-5 bridge.

f Drainage and floodplain impacts are expected to be negligible, which would in turn minimize potential adverse impacts associated with alteration and channelization of floodplains and associated erosion. Hydraulic studies conclude that 100-year flood events would continue to be contained within the existing floodplain boundaries, and therefore would not result in substantial impacts to on-site or off-site locations associated with drainage and flooding.

g There is no (or minimal) potential for channel erosion or scouring at the I-5 bridge piers within the active tidal channel due to low transport velocities within the relatively flat floodplain.

h San Dieguito Lagoon is being restored according to a Master Plan effort. No sedimentation is currently transported between the upstream watershed inputs on the far east of the system to the Pacific Ocean due to numerous dams reducing tidal influence at the ocean inlet. Restoration efforts are expected to improve sediment transport through maintaining an open ocean inlet and increasing tidal influence.

i The proposed I-5 widened bridge design addresses potential impacts associated with the exacerbating effects of SLR on channel erosion, storm surge, and flooding through the existing siting and design of the bridge support structures which are not expected to be subject to wave action, tidal inundation, and flooding due to the distance from the ocean inlet and available flood freeboard. Hydraulic studies completed included the SONGS restoration effort, which further indicate available freeboard would be maintained during a combined 100-year flood event with a projected “high” SLR scenario of 4.5 ft by year 2100, potentially as a result of the floodplain elevation being lowered with ongoing restoration efforts. Studies are underway to determine the potential effects of SLR on the proposed replacement LOSSAN bridge.

j Construction costs associated with the proposed I-5 bridge are anticipated to be provided through either Capital and/or Environmental Mitigation Program (EMP) program funds; further discussions are anticipated to determine appropriate use and allocation of available funds.

Table 3.1.3
AGUA HEDIONDA LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals	Bridge Options *	Bridge Design *	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost
Concerns -Impaired Waterbody -Indicator Bacteria -Sedimentation Siltation -Acoustic impacts from pile driving (during bridge footing construction) on both avian and fish species Special Status Species -Belding's savannah sparrow -California gnatcatcher -Light-footed clapper rail -Tidewater goby surveys are recommended by USFWS -Wandering skipper surveys are recommended by USFWS Constraints -Encina Power Plant Iron Lung Effect -Poseidon Desalination Plant Future Intake (CDP E-06-013; approved 3/5/08) -LOSSAN Railroad Bridge Crossing (CC-075-09; approved 3/12/10) -PCH Crossing LCP Goals -Wetland Acquisition/Restoration -Preserve Coastal Sage Scrub habitat -Preserve California gnatcatcher habitat -Maintain/Expand Recreational Uses Restoration Efforts -Dredging and Eelgrass Planting -Removal of Toxic Algae/Caulerpa (complete) -Hallmark Sites Planning/Preservation Monitoring/Management -Monitoring of Toxic Algae/Caulerpa (ongoing) -Maintenance Dredging	**No Action (Existing I-5 Bridge)**	191 ft long 157.5 ft wide	I-5 Channel bottom width: 76 ft I-5 Channel depth: -7.3 ft NGVD I-5 Channel slope: 1.5:1 (riprap)	4.7 ac existing roadbed fill (0 ac add'l roadbed fill) 0.33 ac existing shaded open water (0 ac add'l shaded open water)	Max. tidal range: 8.26 ft Max. phase lag: 80.1 min	Approx. 330 ac of open water/wetland habitat No change in max. intertidal area: 85.9 ac existing in eastern basin	Steep, narrow abutment at I-5 bridge presently used by wildlife	Existing constriction point; 100-year flood events contained within existing floodplain boundary	Max. flood currents in channel under I-5 bridge: 4.9 ft/sec Max. ebb currents: -2.6 ft/sec (Sand bars and erosion/scour noted)	Tidal velocities in the basins are insufficient to transport fine sand to lagoon mouth, resulting in localized shoaling	3.7 ft freeboard under I-5 bridge maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	N/A
	Approved LOSSAN Bridge (see CC-075-09)	213 ft long 22 ft wide 4 columns/ 4-foot concrete pilings	No change to existing conditions (riprap)	64 sf add'l wetland fill	No change to existing conditions; maintains an existing constriction point near mouth	No change to existing conditions; no listed or sensitive species or habitats within area of effect; no Caulerpa found	Design provides for increased vertical clearance under bridge; no formal access, but may facilitate future trails	No change to existing conditions; maintains an existing constriction point near mouth	No change to existing conditions; narrow tidal flow through channel	No change to existing conditions; tidal velocities in the basins are insufficient to transport sand supply to lagoon mouth	No known change to existing conditions	$2M (estimated)
	Proposed I-5 Bridge (8+4 Buffer-LPA)	**191 ft long 269 ft wide**	**I-5 Channel bottom width: 76 ft I-5 Channel depth: -7.3 ft NGVD I-5 Channel slope: 2:1 (riprap)**	**3.87/4.03 ac add'l roadbed fill in ACOE waters/State wetlands 0.33 ac add'l shaded open water**	**Max. tidal range: 8.38 ft Max. phase lag: 80.1 min**	**1.1 ac add'l intertidal area in eastern basin 1.1 ac decrease subtidal habitat in eastern basin**	**New, wider 16 ft bench at I-5 north bridge abutment; and16 ft bench at south abutment; facilitates new trail connections on east side of lagoon**	**Existing constriction point; no change to upstream elevations; 100-year flood events contained within existing boundary. 6.4 ft of freeboard during 100-year flood by FEMA calculations**	**Max. flood currents in channel under I-5 bridge: 2.3 ft/sec Max. ebb currents: -2.3 ft/sec (Sand bars and erosion/scour noted)**	**Tidal velocities in the basins are insufficient to transport fine sand to lagoon mouth, resulting in localized shoaling**	**At least 1.9 ft freeboard under I-5 bridge maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)**	**Baseline**
	Double Length of Proposed I-5 Bridge Span	267 ft long 267 wide	I-5 Channel bottom width: 152 ft I-5 Channel depth: -7.3 ft NGVD I-5 Channel slope: 1.5:1 (riprap)	TBD	Max. tidal range: 8.51 ft Max. phase lag: 61.6 min	2.3 ac add'l intertidal area in eastern basin 2.3 ac decrease subtidal habitat in eastern basin	New, wider 16 ft bench at I-5 north bridge abutment; and16 ft bench at south abutment; facilitates new trail connections on east side of the lagoon	Longer I-5 bridge creates wider channel reducing constriction point and lowering base floodplain upstream; 100-year flood events contained within existing boundary	Max. flood currents in channel under I-5 bridge: 1.1 ft/sec Max. ebb currents: -1.1 ft/sec (Sand bars and erosion/scour noted)	Tidal velocities in the basins are insufficient to transport fine sand to lagoon mouth, resulting in localized shoaling	At least 1.9 ft freeboard under I-5 bridge maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	$6.6M (additional cost)
	I-5 Chang Channel Bridge	243 ft long 267 ft wide	I-5 Channel bottom width: 128 ft I-5 Channel depth: -7.3 ft NGVD I-5 Channel slope: 1:1 (concrete)	TBD	Max. tidal range: 8.4 ft Max. phase lag: 70.8 min	1.3 ac add'l intertidal area in eastern basin 1.3 ac decrease subtidal habitat in eastern basin	New, wider 16 ft bench at I-5 north bridge abutment; and16 ft bench at south abutment; facilitates new trail connections on east side of the lagoon	Wider I-5 channel alleviates constriction point, lowering base floodplain upstream; 100-year flood events contained within existing boundary	Max. flood currents in channel under I-5 bridge: 1.6 ft/sec Max. ebb currents: -0.98 ft/sec (Sand bars and erosion/scour noted)	Tidal velocities in the basins are insufficient to transport fine sand to lagoon mouth, resulting in localized shoaling	At least 1.9 ft freeboard under I-5 bridge maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	$5.8M (additional cost)

Table 3.1.3 (cont.)
AGUA HEDIONDA LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals	Bridge Options *	Bridge Design *	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost
	Removal of All Roadbed Fill at I-5 Bridge	1,139 ft long; max. length needed to remove all roadbed fill 252 ft wide	*Shoreline protection required for I-5 bridge columns and areas subject to expanded floodplain and tidal inundation	Creates 4.7 ac new, open water	Max. tidal range unrestricted in East Basin, except by I-5 bridge columns and downstream at approved railroad bridge crossing; expanded area subject to tidal inundation	4.7 ac add'l intertidal area in eastern basin 4.7 ac decrease subtidal habitat in eastern basin	New, wider 16 ft bench at I-5 north bridge abutment; and16 ft bench at south abutment; facilitates new trail connections on east side of the lagoon	Greater capacity to pass flood flows; max. flood event conveyed in expanded floodplain	Removes constrictions causing erosion/scour at I-5 bridge abutments; however, loss of deep water habitat and expanded floodplain subjects new areas to scour/erosion	Tidal velocities in the basins are insufficient to transport fine sand to lagoon mouth, resulting in localized shoaling	At least 1.9 ft freeboard under I-5 bridge maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	$55M (additional cost)

NOTES:

*The Phase 2 Study also included an assessment of alternative I-5 channel and bridge designs utilizing flow fence technology; however, due to agency comments and concerns about the technology as unproven and likely infeasible in this application, those concepts are no longer under consideration. Bridge design features for the I-5 options are described in detail within the Draft EIR/EIS and Phase 2 Lagoon Study, and for the LOSSAN bridge within the CCC Staff Report for approval of a federal consistency certification (CC-075-09). As a result of the LOSSAN bridge approval, its impacts and benefits are not considered as part of the PWP.

a No bridge option would involve the construction of new or expanded shoreline protective devices beyond existing abutment protection structures. Bridge designs that remove a portion of the road bed fill to accommodate channel widening would restore a more natural shoreline slope at the facility crossing, whereas bridge options resulting in steeper channel slopes may result in a less natural shoreline configuration.

b Wetland fill consists of road bed fill supporting the bridge span and directly affecting channel width; bridge support structure footprint within the lagoon channel is calculated separately.

c Maximum tidal range is the difference between the lowest observed water level and the highest observed water level. The greater the range, the lower the tidal muting affect within the lagoon system. A reduced time phase lag would also indicate more complete drainage of the East Basin during low tide. Reduced tidal damping and more complete drainage would improve tidal flushing, or exchange between the ocean and lagoon areas, resulting in improved water quality as indicated by higher dissolved oxygen and reduced areas of nutrient concentrations.

d Maximum intertidal area indicates the potential for creation of new mudflats or exposure time for existing mudflats, a benefit to shorebird foraging and overall feature of the East Basin. None of the identified bridge design options would substantially change the high tide inundation area, and no additional wetland area would be created as a result of bridge design. Steep slopes around the man-made, deep water lagoon create a "bath tub" effect that prevents vertical habitat expansion. The restoration and preservation of disturbed wetland and upland (coastal sage scrub) habitats associated with the Hallmark sites would result in additional habitat improvements within the lagoon system, and provide offsetting mitigation for potential impacts that would result from the proposed I-5 replacement bridge. Approximately 10.8 ac of coastal sage scrub preservation, 4.2 ac of wetland creation, and 1.5 ac of wetland preservation are anticipated at the Hallmark sites.

e I-5 and LOSSAN bridges currently act as a wildlife barrier to east-west movement. All bridge design options for the I-5 bridge would include a bench at the abutment to facilitate wildlife movement, as well as use by hikers on the new trail connections proposed adjacent the I-5 on the east and west sides at the Lagoon.

f Drainage and floodplain impacts for all the bridge options are expected to be negligible, which would in turn minimize potential adverse impacts associated with alteration and channelization of floodplains and associated erosion. Hydraulic studies completed by Howard Chang (October 2010) conclude that 100-year flood events would continue to be contained within the existing floodplain boundaries under each option, and therefore would not result in substantial impacts to on-site or off-site locations associated with drainage and flooding.

g Reduced flood and ebb currents indicate more complete conversion of velocity head into potential energy or water elevation. This in turn reduces the potential for channel erosion or scouring at the bridge abutments to occur. The threshold of motion resulting in scour is 0.8 ft/sec to 1 ft/sec.

h East Basin eddy speeds in Agua Hedionda Lagoon are insufficient to transport fine sand to the shore due to the "iron lung" affect from the Encina Power Plant intake, regardless of bridge option design. For sufficient sediment transport, eddy speeds must be maintained at 0.6 ft/sec or greater. It is important to note, however, that maintenance dredging would be needed if both the existing Encina Power Plant and approved, future Poseidon Desalinization Plant were no longer operating within the lagoon.

i All the bridge design options would address potential impacts associated with the exacerbating effects of SLR on shoreline erosion, storm surge, and flooding, by siting and designing the bridge support structures in a manner that minimizes the frequency with which structures are subject to wave action, tidal inundation, and flooding.

j Construction costs associated with I-5 bridge alternatives are anticipated to be provided through either Capital and/or Environmental Mitigation Program (EMP) program funds; further discussions are anticipated to determine appropriate use and allocation of available funds.

Table 3.1.4
SAN ELIJO LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS**

Lagoon System Concerns/ Constraints/Goals	Bridge Options	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost [j]
Concerns -Increased freshwater/nutrient-rich inputs -Flooding/vector control -Sedimentation/siltation -Reduced tidal prism/constrictions resulting in a transition from mudflat to subtidal habitat Special Status Species -California least tern -Belding's savannah sparrow -Wandering skipper butterfly -California coastal gnatcatcher (Critical Habitat) Constraints -Railroad Bridge Crossing -South Coast Highway 101 Crossing -Concrete dike/floodgates -Upstream reservoirs -Buried utilities Encinitas LCP Goals -Preserve scenic views/vista points at lagoon -Preserve the integrity, function, productivity, and long-term viability of sensitive habitats -Acquire or preserve the entire undeveloped riparian corridor that drains into the lagoon -Preserve/protect no net loss of wetlands -Maintain/enhance wildlife corridors -Encourage passive/compatible recreational activity -Remove impediments to internal lagoon water circulation and increase tidal circulation	**No Action I-5 (Existing Bridge)**	340 ft long 157.5 ft wide *Two bridges	Channel bottom width: 130 ft Channel depth: -6.0 ft NGVD Channel slope: 1:1 on north abutment, adjacent channel and Manchester Avenue (riprap)	10.2 ac existing fill (0 ac additional fill) 0.6 ac existing shaded wetland (0 ac additional shaded wetland)	Max. tidal range: 5.06 ft Max. residence time: N/A as minimal tides in east basin	612 ac existing wetland/upland riparian habitat	Narrow south abutment presently used by wildlife and pedestrians; Manchester Avenue located on north abutment	Existing constriction point; 100-year flood events contained within existing floodplain boundary	Max. flood currents in channel under I-5 bridge: 0.1 ft/sec Max. ebb currents: -0.1 ft/sec	Sediment trapped in system due to active tidal channel constriction points; shoreline sand supply limited without improved/increased tidal flushing	19.7 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (assumes 4.5 ft of SLR)	N/A
	No Action Railroad (Existing Single-track Bridge)	~321 ft long ~22 ft wide	Channel bottom width: 161 ft Channel depth: Varies Slope: TBD	No additional fill	Central Basin max. tidal range: 4.97 ft Max. residence time: 6.8 days	Change in tidal wetlands acreage is dependent on which restoration alternative is selected	No wildlife corridors or sanctioned trails provided at railroad crossing	Existing constriction point	Max. flood currents in channel under railroad bridge: 1.0 ft/sec Max. ebb currents: -1.0 ft/sec	Sediment trapped in system due to active tidal channel constriction points; shoreline sand supply limited without improved/increased tidal flushing	6.4 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (assumes 4.5 ft of SLR)	N/A
	Proposed I-5 Bridge (8+4 Buffer) **No project/Alt 1A** **For SELRP**	370 ft long 252.9 ft wide *Single bridge – gap filled	Channel bottom width: 130 ft Channel depth: -6.0 ft NGVD Channel slope: 2:1 (riprap)	0.63/0.99 ac add'l roadbed fill in ACOE/State waters/ wetland 0.54 add'l shaded ACOE/State waters/ wetland	At I-5 max. tidal range: 5.06 to 5.43 ft for No Project and Alt 1A Max. residence time 12.7 days depending for Alt 1A	Change in tidal wetlands acreage is dependent on which restoration alternative is selected	A fenced 12 ft pedestrian trail would be created on the south abutment with a 12 ft wildlife bench lower on the abutment and separated from the trail; wildlife bench would be near the high tide elevation at the lagoon	The floodplain is dependent on the restoration alternative selected. Only Alt 2A keeps all of Manchester Avenue outside the floodplain. Increasing the length of I-5 for Alts 1A and 1B moves the area of inundation for Manchester Avenue further west	Max. flood currents in channel under I-5 bridge: 0.1 to 0.3 ft/sec Max. ebb currents: --0.1 to -0.4 ft/sec For No Project and Alt 1A	Dependent on restoration alternative selected; along main flow path in lagoon sediment would be carried to the ocean; along edges sediment would be deposited. Alt 2A most efficiently transports sediment downstream	19.6 to 19.7 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (assumes 4.5 ft of SLR) for No Project and Alt 1A	Baseline $26.8M

Table 3.1.4 (cont.)
SAN ELIJO LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS**

Lagoon System Concerns/ Constraints/Goals	Bridge Options	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost [j]
Cont. Restoration Efforts -Dredging/maintaining an open tidal inlet -Tidal marsh restoration -Removal of invasive weed species -Modifications to constriction points	**Optimized I-5 Bridge (8+4 Buffer-LPA)**	**603.1 ft long 288-353.6 ft wide**	**All Alts = Channel bottom width: 261 ft Channel depth: -6.0 to -6.5 ft NGVD Channel slope: 2:1 (riprap)**	**0.59/0.21 ac net created ACOE/State waters/wetland from wider bridge 1.79 add'l shaded ACOE/State waters/ wetland**	**At I-5 max. tidal range: 4.66 to 8.06 ft depending on which restoration alternative is selected Max. residence time: 4.5 to 7.5 days for Alts 2A and 1B**	**Change in tidal wetlands acreage is dependent on which restoration alternative is selected**	**A fenced 12 ft pedestrian trail would be created on the south abutment with a 12 ft wildlife bench lower on the abutment and separated from the trail; wildlife bench would be near the high tide elevation at the lagoon**	**The floodplain is dependent on the restoration alternative selected. Only Alt 2A keeps all of Manchester Avenue outside the floodplain. Increasing the length of I-5 for Alts 1A and 1B moves the area of inundation for Manchester Avenue further west**	**Max. flood currents in channel under I-5 bridge: 0.4 to 0.9 ft/sec Max. ebb currents: -0.3 to -0.7 ft/sec for Alts 1B and 2A**	**Dependent on restoration alternative selected; along main flow path in lagoon sediment would be carried to the ocean; along edges sediment would be deposited. Alt 2A most efficiently transports sediment downstream**	**19.5 to 21.2 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (assumes 4.5 ft of SLR) for Alts 1B and 2A**	**$16.1M (additional cost)**
Monitoring/Management -Maintenance dredging -Invasive species control program -Chemical/biological water quality monitoring to ensure adequate tidal mixing	**Optimized LOSSAN Railroad Bridge (Double-track Alternatives)**	**Alts 1A and 1B = ~321 ft long ~50 ft wide Alt 2A = 590 ft+ long for ~50 ft wide**	**Alts 1A and 1B = Channel bottom width: 161 ft Channel depth: -5.5 ft Alt 2A = Channel bottom width: 590 ft Channel depth: -15.0 ft NGVD Channel slope: TBD**	**TBD**	**Central Basin max. tidal range: 5.49 to 8.10 ft depending on which restoration alternative is selected Max. residence time: 1.9 to 4.8 days depending on which restoration alternative is selected**	**Change in tidal wetlands acreage is dependent on which restoration alternative is selected**	**TBD**	**The floodplain is dependent on the restoration alternative selected. Only Alt 2A keeps all of Manchester outside the floodplain**	**Max. flood currents in channel under railroad bridge: 1.4 to 2.0 ft/sec Max. ebb currents: -0.6 to -1.9 ft/sec Depending on which restoration alternative is selected**	**Dependent on restoration alternative selected; along main flow path in lagoon sediment would be carried to the ocean; along edges sediment would be deposited. Alt 2A most efficiently transports sediment downstream**	**6.3 to 7.9 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (assumes 4.5 ft of SLR) depending on which restoration alternative is selected**	**TBD**

Table 3.1.4 (cont.)
SAN ELIJO LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS**

Lagoon System Concerns/ Constraints/Goals	Bridge Options	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost [j]
	I-5 Bridge Option w/ Removal of All Roadbed Fill	1,340 ft long; max bridge length needed to remove all roadbed fill 252.9 ft wide	Removes shoreline alteration from roadbed fill; however, shoreline protection required for bridge pilings and potentially areas subject to expanded floodplain and tidal inundation (depending on lagoon restoration)	+8.85 ac net, new shaded wetland	Max. tidal range unrestricted except by bridge pilings; expanded area subject to tidal inundation	Change in tidal wetlands acreage is dependent on which restoration alternative is selected	A fenced 12 ft pedestrian trail would be created on the south abutment with a 12 ft wildlife bench lower on the abutment and separated from the trail; wildlife bench would be near the high tide elevation at the lagoon	Greater capacity to pass flood flows; max. flood event conveyed in expanded floodplain	Removes flood flow and tidal constrictions causing scour at abutments; however, expanded floodplain subjects new areas to scour/erosion	Expanded floodplain subjects new areas to scour/erosion; removes constriction to better convey sediment to shoreline	TBD	$60.4M (additional cost)

NOTES:

**The San Elijo Lagoon Restoration Project (SELRP) is under development to restore and maintain the lagoon's estuarine and brackish tidal habitats through improved tidal flushing; the I-5 bridge options would be designed to accommodate and facilitate the lagoon restoration plan alternative selected.

a Bridge design and channel features are described in detail within the Draft EIR/EIS; LOSSAN replacement bridge design features are under consideration. No proposed I-5 bridge options would involve the construction of new or expanded shoreline protective devices beyond existing abutment protection structures, if required.

b Wetland fill consists of I-5 bridge structure footprint within the active tidal lagoon channel (column dimensions and placement are unknown, thus the whole bridge footprint was included), as well as road bed fill supporting the bridge span.

c Maximum tidal range is the difference between the lowest observed water level and the highest observed water level. The greater the range, the lower the tidal muting affect within the lagoon system. Due to existing downstream constraints, tidal influence at the I-5 crossing is limited. The lagoon's flat bottom lacks the change in elevation to achieve higher flow velocities and thus produces an extremely level water surface profile until the flow passes the Coast Highway.

d Due to the current constraints at all north-south transecting facilities across the lagoon, San Elijo Lagoon has been transitioning from mudflats to subtidal habitat. Dredging activities have led to breaching of existing ocean inlet to support lagoon water quality.

e I-5 currently acts as a wildlife barrier to east-west movement. All bridge design options would include a wider bench at the south abutment to facilitate wildlife movement, as well as a separate, fenced pedestrian trail.

f Drainage and floodplain impacts are expected to be negligible, which would in turn minimize potential adverse impacts associated with alteration and channelization of floodplains and associated erosion. Hydraulic studies conclude that 100-year flood events would continue to be contained within the existing floodplain boundaries under each option, although the resulting floodplain is dependent on the restoration alternative selected.

g The existing I-5 and LOSSAN bridges are a constriction point within the active tidal channel. With increased/improved tidal flows, as well as storm water runoff flood flows, there is potential for channel erosion or scouring at the bridge abutments.

h San Elijo Lagoon is managed under an existing sediment control program. Despite this active management, the tidal prism of the lagoon is not sufficient to prevent undesirable sedimentation of the lagoon, and dredging of the majority of the west and central basins is necessary to maintain the ocean inlet. Major planning efforts to restore a "healthy" balance to the lagoon tidal regime have been made, especially through modeling of tidal inlet and channel relocation alternatives.

i All the bridge designs would address potential impacts associated with the exacerbating effects of SLR on shoreline erosion, storm surge, and flooding, by siting and designing the bridge support structures in a manner that minimizes the frequency with which structures are subject to wave action, tidal inundation, and flooding. Studies are underway to determine the potential effects of SLR on the proposed replacement LOSSAN bridge.

j Construction costs associated with the proposed I-5 bridge are anticipated to be provided through either Capital and/or Environmental Mitigation Program (EMP) program funds; further discussions are anticipated to determine appropriate use and allocation of available funds.

Table 3.1.6
BATIQUITOS LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals	Bridge Option	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost [j]
Concerns -Increased sedimentation/siltation -Excessive nutrient loads from agricultural land uses -Invasive plant species Special Status Wildlife Species -Western snowy plover -Belding's savannah sparrow -California gnatcatcher -California least tern -Light-footed clapper rail -Tidewater goby Constraints -Railroad bridge crossing -Carlsbad Boulevard/Highway 101 crossing -Buried utilities/infrastructure Carlsbad LCP Goals -Restoration of natural resources and wildlife habitat -Maintain maximum amount of permanent open space -Limit activities to habitat enhancement, educational and scientific nature study, passive recreation, and aquaculture having no significant adverse effect on natural processes or scenic quality -Incorporate stringent drainage control measures upstream/upslope Restoration Efforts -Maintain tidal inlet/tidal flows -Remove excess sediment -Bird nesting habitat/deep water fish habitat Monitoring/Management -Maintenance dredging -Reestablish eel grass and native cord grass -Monitor invasive plant species -Monitor chemical, biological, and tidal improvements within basins after 1996 restoration project initiated	**No Action I-5 (Existing Bridge)**	219 ft long 2 bridges each 68 ft wide+19.2 ft gap	Channel bottom width: 66 ft at bottom with 4:1 slopes to edges of the abutment (approx. 106 ft between abutments) Channel depth: -5.3 ft (shoaled) Channel slope: 2:1 (riprap)	9.2 ac existing roadbed fill (0 ac additional fill) 0.49 ac existing shaded wetland (0 ac additional shaded wetland)	Max. tidal range at East Basin: 6.7 ft Max. phase lag: 186 min Max. residence time: TBD	600 ac wetland habitat; 267.6 max intertidal area	Steep, narrow abutments on north and south presently used by wildlife	Existing constriction point; 100-year flood events contained within existing floodplain boundary with approximately 6.3 ft of freeboard	Max. flood currents in channel under I-5 bridge: 2.3 ft/sec Max. ebb currents: -1.9 ft/sec (20 ft scour holes noted at bridge)	East Basin swirl and eddy speeds (0.3 ft/sec) insufficient to transport fine sand but provide a stirring mechanism to maintain sediment particles in suspension	At least 4.5 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	N/A
	No Action Railroad (Existing Single-track Bridge)	~310 ft long ~22 ft wide	Channel bottom width: 162 ft Channel depth: -6.35 ft	TBD	Maximum tidal range in central basin: 7.26 ft Maximum residence time: 1.6 days central basin	Tidal range would be unchanged with existing bridges	Existing slope on abutment could be used by wildlife; no sanctioned trails across railroad	100-year flood predicted for existing bridge is 9.5 ft of freeboard	Max. flood currents in channel under I-5 bridge: 3.7 ft/sec Max. ebb currents: 4.3 ft/sec	Velocity through railroad bridge high, with more potential to scour	At least 7.4 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	N/A
	Proposed I-5 Bridge (8+4 Buffer) ***Replaces existing bridge length; does not include staging considerations**	246 ft long 226 ft wide	Channel bottom width: 66 ft at bottom with 4:1 slopes to edges of the abutment (approx. 106 ft between abutments) Channel depth: -5.3 ft (shoaled) Channel slope: 2:1 (riprap)	3.7/4.15 ac additional roadbed fill of ACOE WUS/ State wetland 0.28 ac add'l shaded ACOE WUS/State wetland	Max. tidal range at East Basin: 6.7 ft Max. phase lag: 186 min Max. residence time: TBD	No change in intertidal area	New, wider 16 ft bench at both abutments; north abutment pedestrian trail could also be used by wildlife	Existing constriction point reduced, base floodplain lowered by 0.7 ft upstream; 100-year flood events contained within existing boundary. 6.3 ft of freeboard during 100 year flood with high tides and storm wave runup	Max. flood currents in channel under I-5 bridge: 2.3 ft/sec Max. ebb currents: -1.9 ft/sec (20 ft scour holes noted at bridge)	East Basin swirl and eddy speeds (0.3 ft/sec) insufficient to transport fine sand but provide a stirring mechanism to maintain sediment particles in suspension	At least 4.8 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	Baseline 13.4M
	I-5 Bridge Option 2 (Double Length of Proposed Bridge Span)	350 ft long** 226 ft wide	Channel bottom width: 212 ft Channel depth: -5.3 ft Channel slope: 2:1 (riprap)	TBD	Max. tidal range at East Basin: 7.4 ft Max. phase lag: 120 min Max. residence time: TBD	Additional 19.2 ac of intertidal area	New, wider 16 ft bench at both abutments; north abutment pedestrian trail could also be used by wildlife	Longer bridge creates wider channel reducing constriction point and lowering base floodplain upstream; 100-year flood events contained within existing boundary. At least 6.6 ft of freeboard during 100-year flood with high tides and storm wave runup	Max. flood currents in channel under I-5 bridge: 1 ft/sec Max. ebb currents: -0.8 ft/sec (Flows below scour threshold)	East Basin swirl and eddy speeds (0.3 ft/sec) insufficient to transport fine sand but provide a stirring mechanism to maintain sediment particles in suspension	At least 4.8 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	$7.13M (additional cost)

Table 3.1.6 (cont.)
BATIQUITOS LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals	Bridge Option	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential SLR Constraints [i]	Construction Cost [j]
	I-5 Bridge Option 3 (Chang Channel)	246 ft long 226 ft wide	Channel bottom width: 180 ft Channel depth: -7.0 ft Channel slope: 1:1 (riprap)	TBD	Max. tidal range at East Basin: 7.26 ft Max. phase lag: 136 min Max. residence time: TBD	Additional 13.5 ac of intertidal area	New, wider 16 ft bench at both abutments; north abutment pedestrian trail could also be used by wildlife	Wider channel alleviates constriction point, lowering base floodplain upstream; 100-year flood events contained within existing boundary. At least 6.6 ft of freeboard during 100-year flood with high tides and storm wave runup	Max. flood currents in channel under I-5 bridge: 1.24 ft/sec Max. ebb currents: -0.98 ft/sec (Flows below scour threshold)	East Basin swirl and eddy speeds (0.3 ft/sec) insufficient to transport fine sand but provide a stirring mechanism to maintain sediment particles in suspension	At least 4.8 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	$1.26M (additional cost)
	Optimized I-5 Bridge (8+4 Buffer-LPA) ***Staging with existing HOV**	**282 ft long, two bridges each 122 ft wide with 19.2 ft gap**	**Channel bottom width: 183.5 ft** **Channel depth: -7 ft NGVD** **Channel slope: 2:1 (riprap)**	**4.32/4.8 ac net additional road bed fill in ACOE/State wetland** **0.56 ac add'l shaded ACOE/ State wetland**	**Maximum tidal range in East basin: 7.35ft** **Maximum phase lag: TBD** **Maximum residence time: 5.4 days east basin**	**Additional ~13.0 ac of intertidal area**	**New, wider 16 ft bench at both abutments; north abutment pedestrian trail could also be used by wildlife.**	**Wider channel alleviates constriction point, lowering base floodplain upstream; 100-year flood events contained within existing boundary. At least 6.6 ft freeboard during 100-year flood with high tides and storm wave runup**	**Max. flood currents in channel under I-5 bridge: 2.4 ft/sec** **Max. ebb currents: 2.3 ft/sec**	**Velocity of flow through I-5 bridge would decrease allowing scour holes to fill; increased velocity at inlet would make it more stable**	**At least 4.8 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)**	**$3.85M (additional cost)**
	Optimized I-5 Bridge (8+4 Buffer) ***Staging without existing HOV**	282 ft long, two bridges each 98 ft wide with 19.2 ft gap	Channel bottom width: 183.5 ft Channel depth: -7 ft NGVD Channel slope: 2:1 (riprap)	3.13/3.58ac net additional road bed fill of ACOE/ State wetland 0.44ac add'l shaded ACOE/ State wetland	Maximum tidal range in East basin: 7.35 ft Maximum phase lag: TBD Maximum residence time: 5.4 days east basin	Additional ~13.0 ac of intertidal area	New, wider 16 ft bench at both abutments; north abutment pedestrian trail could also be used by wildlife	Wider channel alleviates constriction point, lowering base floodplain upstream; 100-year flood events contained within existing boundary. At least 6.6 ft freeboard during 100-year flood with high tides and storm wave runup	Max. flood currents in channel under I-5 bridge: 2.4 ft/sec Max. ebb currents: 2.3 ft/sec	Velocity of flow through I-5 bridge would decrease allowing scour holes to fill; increased velocity at inlet would make it more stable	At least 4.8 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	TBD

Table 3.1.6 (cont.)
BATIQUITOS LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals	Bridge Option	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit [c] (CA§ 30230/30231)	Habitat Impact/ Benefit from Improved Tidal Circulation [d] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential SLR Constraints [i]	Construction Cost [j]
	Optimized LOSSAN Railroad Bridge (Double-track)	**~350 ft long ~50 ft wide**	**Channel bottom width: 202 ft** **Channel depth: -7.0 ft**	**TBD**	**Maximum tidal range in central basin: 7.40 ft** **Maximum residence time: 1.6 days central basin**	**Additional intertidal habitat would result from increased tidal range**	**TBD**	**100-year flood predicted for existing bridge is 9.0 ft of freeboard due to higher tides with optimized bridge**	**Max. flood currents in channel under I-5 bridge: 2.7 ft/sec** **Max. ebb currents: 2.9 ft/sec**	**Velocity of flow through railroad bridge would decrease making the channel less scoured; increased velocity at inlet would make it more stable**	**At least 7.0 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)**	**TBD**
	I-5 Bridge Option w/ Removal of All Roadbed Fill	1,918 ft long; max. length needed to remove all roadbed fill 226 ft wide	Removes shoreline alteration from roadbed fill; however, shoreline protection still required for bridge columns and potentially areas subject to expanded floodplain and tidal inundation	Creates +9.2 ac new, shaded wetland	Max. tidal range unrestricted in East Basin except by bridge columns; expanded area subject to tidal inundation	>19.2 ac additional intertidal area; potential erosion of nesting bird islands/shoals within Central Basin if tidal flows increase south of island	New, wider 16 ft bench at both abutments; north abutment pedestrian trail could also be used by wildlife	Greater capacity to pass flood flows; max. flood event conveyed in expanded floodplain. At least 6.6 ft freeboard during 100-year flood with high tides and storm wave runup	Removes constrictions causing scour at abutments and increases flood currents; however, expanded floodplain subjects new areas to scour/erosion	Removes constrictions better conveying sediment to shoreline with increased East Basin eddy speeds/flow velocities	At least 4.8 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	$101M (additional cost)

NOTES:

a Bridge design and channel features are described in detail within the Draft I-5 EIR/EIS, Phase 2 Lagoon Study, and Batiquitos Lagoon Bridge Optimization Study; LOSSAN replacement bridge design features are under consideration, whereas current and optimized bridge lengths and widths for railroad crossings have been estimated using GIS. Habitats and wetland delineations around railroad bridge are not currently available. No bridge option would involve the construction of new or expanded shoreline protective devices beyond existing abutment protection structures. Bridge designs that remove a portion of the road bed fill to accommodate channel widening would restore a more natural shoreline slope at the facility crossing. Double length bridge span does not need to be twice as long for the channel to double in width.

b Wetland fill consists of road bed fill supporting the bridge span and directly affecting channel width only; existing and new proposed bridge support structure footprints within the lagoon channel are calculated separately.

c Maximum tidal range is the difference between the lowest observed water level and the highest observed water level. The greater the range, the lower the tidal muting affect within the lagoon system. A reduced time phase lag would also indicate more complete drainage of the East Basin during low tide. Reduced tidal damping and more complete drainage would improve tidal flushing, or exchange between the ocean and lagoon areas, resulting in improved water quality as indicated by higher dissolved oxygen and reduced areas of nutrient concentrations.

d Maximum intertidal area indicates the potential for creation of new mudflats or exposure time for existing mudflats, a benefit to shorebird foraging and overall feature of the East Basin.

e I-5 and the railroad bridges currently act as a wildlife barrier to east-west movement. All I-5 bridge design options would include a wider bench at the abutment to facilitate wildlife movement, as well as for use by hikers on the new trail connection proposed along the north abutment adjacent the I-5.

f Drainage and floodplain impacts for all the bridge options are expected to be negligible, which would in turn minimize potential adverse impacts associated with alteration and channelization of floodplains and associated erosion. Hydraulic Studies conclude that 100-year flood events would continue to be contained within the existing floodplain boundaries under each option, and therefore would not result in substantial impacts to on-site or off-site locations associated with drainage and flooding.

g Reduced flood and ebb currents indicate more complete conversion of velocity head into potential energy or water elevation. This in turn reduces the potential for channel erosion or scouring at the bridge abutments to occur. Under the existing and proposed replacement bridge scenarios, two 20 ft deep scour holes have formed on either side of the I-5 bridge due to the excess velocity head of the tidal flow passing under the bridge. The threshold of motion resulting in scour is 0.8 ft/sec to 1 ft/sec.

h East Basin eddy speeds in Batiquitos Lagoon are insufficient to transport fine sand to the shore regardless of bridge design option. For sufficient sediment transport, eddy speeds must be maintained at 0.6 ft/sec or greater.

i All the bridge design options would address potential impacts associated with the exacerbating effects of SLR on shoreline erosion, storm surge, and flooding, by siting and designing the bridge support structures in a manner that minimizes the frequency with which structures are subject to wave action, tidal inundation, and flooding. All I-5 bridge options would be able to maintain adequate freeboard. Studies are underway to determine the potential effects of SLR on the proposed replacement LOSSAN bridge.

j Construction costs associated with the proposed I-5 bridge are anticipated to be provided through either Capital and/or Environmental Mitigation Program (EMP) program funds; further discussions are anticipated to determine appropriate use and allocation of available funds.

Table 3.1.7
BUENA VISTA LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals (Coastal Conservancy Project)	Bridge Option	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit (CA§ 30230/ 30231)	Habitat Impact/ Benefit [d] from Improved Tidal Circulation[c] (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential Sea Level Rise (SLR) Constraints [i]	Construction Cost
Concerns -Sedimentation/Siltation -Sensitive bird species/island maintenance Special Status Species -Belding's savannah sparrow -California gnatcatcher -Light-footed clapper rail Constraints -Concrete weir at Lagoon mouth -Railroad Bridge Crossing -Carlsbad Boulevard/Coast Highway Crossing -Buried Infrastructure LCP Goals -Provide public access and passive recreation (e.g., upland trails/fishing/viewing areas) -Protect sensitive biological habitats and water quality with buffers/ fencing/restoration -Minimize siltation, erosion and sedimentation -Prohibit any diking, dredging, or filling, except for CDFG approved restoration Restoration Efforts -Dredging/sedimentation control -Native vegetation restoration Monitoring/Management -Potential for new freshwater, saltwater, or mixed regime with future restoration efforts -Maintenance Dredging	**No Action I-5 (Existing Bridge)**	102.4 ft long 184 ft wide	Channel bottom width: 24 ft Channel depth: -2.0 ft NGVD Channel slope: 1.5:1 (riprap)	3.4 ac existing fill 0.25 ac existing shaded ACOE WUS/State wetland	The lagoon is an existing freshwater system with no tidal influence; future lagoon restoration efforts under consideration include a new tidal influenced regime, or a salt marsh/mixed system	No change to intertidal habitats.	Steep, narrow and low-profile abutment on north side may currently be used by wildlife	Existing constriction point; 100-year flood events contained within existing floodplain boundary	Existing constriction point subject to fluvial flood flows & associated erosion/ scour; existing riprap on slopes. Low potential for tidal flows to erode/scour near bridge abutments due to minimal/no tidal influence	Sediment trapped in system; shoreline sand supply limited due to absence of tidal flushing	6.4 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	N/A
	No Action Railroad (Existing Bridge)	~317 ft long ~22 ft wide	Channel bottom width: 17ft Channel depth: -2.5 ft NGVD	TBD	Minimal tidal circulation in the Weir and Railroad basins. Current bridge depth does limit tidal flows in proposed saltwater restoration alternatives	No change to existing habitats unless a saltwater restoration plan is implemented	Currently gradual slopes on both abutments	TBD	Existing constriction point subject to fluvial flood flows and associated erosion/ scour; existing riprap on slopes. Low potential for tidal flows to erode/scour near bridge abutments due to minimal/no tidal influence	Sediment trapped in system; shoreline sand supply limited due to absence of tidal flushing	TBD	N/A
	Proposed Bridge (8+4 Buffer)	131.2 ft long 252.9 ft wide	Channel bottom width: 50 ft (est.) Channel depth: -2.0 ft NGVD Channel slope: 2:1 (riprap)	1.12/1.39 ac additional roadbed fill in ACOE WUS/ State wetland 0.15 ac additional shaded ACOE WUS/State wetland	Same as existing, or accommodate future lagoon restoration. With lagoon restoration, introduction of new tidal prism possibly restricted by road fill and bridge pilings	No change to existing habitats unless a saltwater restoration plan is implemented	New, 16 ft bench at both abutments; will be implemented	Longer bridge with columns placed further apart creates wider channel alleviating constriction point and lowers base floodplain 0.4 ft upstream. 100-year flood events contained within existing floodplain boundary	Wider channel alleviates constriction point and lowers base floodplain reducing erosion/scour from flood events dependent on future lagoon restoration	Same as existing or, dependent on future lagoon restoration, wider channel could facilitate improved sediment transport to shoreline	0 ft freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR) based on designed soffit height for Optimized Bridge	Baseline $7.6M
	LOSSAN Railroad Bridge (Double-track, optimized)	**~317 ft long ~50 ft wide**	**Channel bottom width: 17ft Channel depth: -6.0 ft NGVD**	**TBD**	**Deeper channel optimized for saltwater restoration alternatives for maximum proposed tidal flows**	**No change to existing intertidal habitats unless a saltwater restoration plan is implemented**	**TBD**	**Depending on the restoration alternative 100-year flood would have 0.4 to 4.5 ft of freeboard if soffit is not changed based on fluvial modeling with dynamic channel, not FEMA fixed constraints**	**Depending on the restoration alternative optimized channel would result in the minimum amount of scour/erosion**	**Same as existing or, dependent on future lagoon restoration, optimized channel could facilitate improved sediment transport to shoreline**	**Bridge soffit would need to be raised to allow some freeboard for freshwater alternatives. Saltwater alternatives have minimal freeboard with 100-year flood and SLR**	**TBD**

Table 3.1.7 (cont.)
BUENA VISTA LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals (Coastal Conservancy Project)	Bridge Option	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit (CA§ 30230/ 30231)	Habitat Impact/ Benefit [d] from Improved Tidal Circulation (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential SLR Constraints [i]	Construction Cost
	Proposed Bridge (8+4 Buffer) Optimized Bridge without existing HOV	197 ft long 293 ft wide * Wider channel reduces shoreline alteration; however, shoreline protection required for bridge pilings and abutments	Channel bottom width: 105 ft (estimated) Channel depth: -6.0 ft Channel slope: 2:1 (riprap)	0.73/1.00 ac net add'l roadbed fill in ACOE WUS/State wetland 0.39ac additional shaded State wetland	Same as existing, or can accommodate future lagoon restoration. With lagoon restoration, optimized bridge works with a range of restoration alternatives	No change to existing intertidal habitats unless a saltwater restoration plan is implemented	New 16 ft bench at both abutments	Longer bridge with columns placed further apart creates wider channel alleviating constriction point and lowers base floodplain. Optimized bridge would pass 100-year flood with at least 2.5 to 8.2 ft of freeboard depending on the restoration alternative. Optimized bridge at I-5 without changes to Coast Highway and inlet weir, and restoration dredging could cause flooding downstream	Wider channel alleviates constriction point and lowers base floodplain reducing erosion/scour from flood events dependent on future lagoon restoration	Same as existing or, dependent on future lagoon restoration, wider channel could facilitate improved sediment transport to shoreline	At least 1.0 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR) depending on which restoration alternative is selected	TBD
	Proposed Bridge (8+4 Buffer-LPA) Optimized Bridge w/existing HOV	**197 ft long 336 ft wide * Wider channel reduces shoreline alteration; however, shoreline protection required for bridge pilings and abutments**	**Channel bottom width: 105 ft (estimated)** **Channel depth: -6.0 ft** **Channel slope: 2:1 (riprap)**	**0.81/1.14ac net add'l roadbed fill in ACOE WUS/State wetland** **0.48 ac additional shaded State wetland**	**Same as existing, or can accommodate future lagoon restoration. With lagoon restoration, optimized bridge works with a range of restoration alternatives**	**No change to existing intertidal habitats unless a saltwater restoration plan is implemented**	**New 16 ft bench at both abutments**	**Longer bridge with columns placed further apart creates wider channel alleviating constriction point and lowers base floodplain. Optimized bridge would pass 100-year flood with at least 2.5 ft of freeboard. Optimized bridge at I-5 without changes to Coast Highway and inlet weir, and restoration dredging could cause flooding downstream**	**Wider channel alleviates constriction point and lowers base floodplain reducing erosion/scour from flood events dependent on future lagoon restoration**	**Same as existing or, dependent on future lagoon restoration, wider channel could facilitate improved sediment transport to shoreline**	**At least 1.0 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR) depending on which restoration alternative is selected**	**$7.0 M (additional cost)**

Table 3.1.7 (cont.)
BUENA VISTA LAGOON BRIDGE OPTIONS SUMMARY ANALYSIS

Lagoon System Concerns/ Constraints/Goals (Coastal Conservancy Project)	Bridge Option	Bridge Design [a]	Channel Dimension and Protection Features [a] (CA§ 30253(2)/ 30235)	Estimated Wetland Fill [b] (CA§ 30233)	Tidal Circulation Impact/Benefit (CA§ 30230/ 30231)	Habitat Impact/ Benefit [d] from Improved Tidal Circulation (CA§ 30240)	Wildlife Corridor/ Trail Linkage Impact/Benefit [e] (CA§ 30240/ 30210-30214)	FEMA Floodplain Impact/Benefit [f] (CA§ 30253)	Erosion/Scour Impact/Benefit [g] (CA§ 30253(2)/ 30235)	Shoreline Sand Supply Impact/Benefit [h] (CA§ 30235)	Potential SLR Constraints [i]	Construction Cost
	Bridge Option w/ Removal of All Roadbed Fill	558 ft long; max. length needed to remove all roadbed fill 252.9 ft wide * Removes shoreline alteration from roadbed fill; however, shoreline protection required for bridge pilings and potentially areas subject to expanded floodplain and tidal inundation (depending on lagoon restoration; riprap assumed)	TBD	Adds 3.4 ac of shaded, freshwater marsh habitat to I-5 Basin/Coast Highway Basin	Same as existing, or accommodate future lagoon restoration. With lagoon restoration, introduction of new tidal prism unrestricted except by bridge pilings; expanded area could be subject to tidal inundation if mouth is maintained open	No change to existing intertidal habitats	Unrestricted movement under bridge, some areas under bridge would be left at a higher elevation than the water to accommodate wildlife movement	Greater capacity to pass flood flows. Max. flood event conveyed in expanded floodplain. However, without changes to Coast Highway, inlet weir, and restoration dredging wider floodplain could cause downstream flooding	Greater capacity to pass fluvial flood flows in expanded flood-plain; limits structures subject to erosion/ scour to bridge pilings. Introduction of tidal prism with lagoon restoration may increase potential for erosion/scour at bridge pilings and areas subject to expanded tidal inundation	Same as existing or, dependent on future lagoon restoration, expanded floodplain subjects new areas to scour/erosion upstream and conveys sediment transport to shoreline	At least 9.2 ft of freeboard maintained under 'high' projection of SLR estimates in year 2100 (4.5 ft of SLR)	$49M (additional cost)

NOTES:

a Bridge design features are described in detail within the Draft EIR/EIS. No bridge would involve the construction of new or expanded shoreline protective devices beyond existing abutment protection structures. Bridge designs that remove a portion of the road bed fill to accommodate channel widening would restore a more natural shoreline slope at the crossing.

b Wetland fill consists of bridge support structure footprint within the lagoon channel, as well as road bed fill supporting the bridge span and directly affecting channel width.

d Due to the current constraints and north-south transecting facilities, the lagoon has developed into a freshwater marsh with no tidal influence. Dredging activities have led to development of an island within the I-5 Basin that provides nesting/roosting opportunities for sensitive bird species.

e I-5 currently acts as a wildlife barrier to east-west movement. All bridge design options would include a bench at the abutment to facilitate wildlife movement, as well as use by hikers on the new trail connections proposed adjacent the I-5 on the east and west sides at the Lagoon.

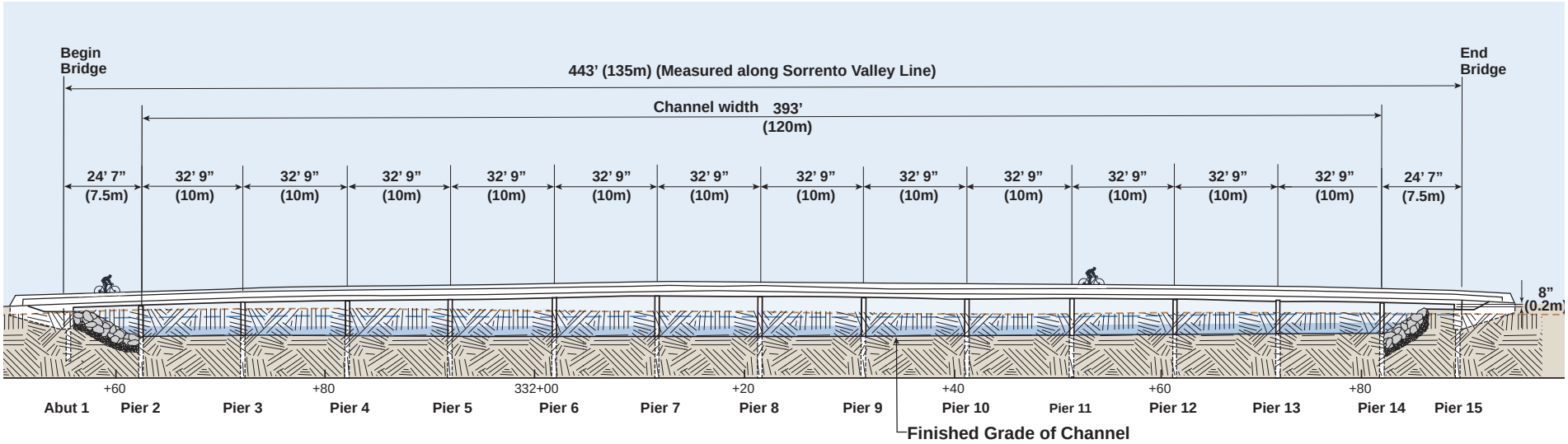
f Drainage and floodplain impacts for all the bridge options are expected to be negligible, which would in turn minimize potential adverse impacts associated with alteration and channelization of floodplains and associated erosion. Hydraulic studies conclude that 100-year flood events would continue to be contained within the existing floodplain boundaries under each option, and therefore would not result in substantial impacts to on-site or off-site locations associated with drainage and flooding.

g The potential for channel erosion or scouring at the bridge abutments to occur is reduced with removal of existing channel constraints due to more complete conversion of flood velocity to energy.

h The Lagoon is a shallow freshwater system managed under an existing sediment control program. No sediment is transported between the Buena Vista Creek on the far east of the system to the Pacific Ocean, which is closed to tidal influence as a result of an existing concrete weir and berm.

i All bridge designs would address potential impacts associated with the exacerbating effects of SLR on shoreline erosion, storm surge, and flooding, by siting and designing the bridge support structures in a manner that minimizes the frequency with which structures are subject to wave action, tidal inundation, and flooding.

Figure 3-1.1a: Los Peñasquitos Lagoon: Lagoon Setting



N

BRIDGE # 57-1062

0 50 100 feet

Proposed Bike Bridge over Carmel Creek

(Also known as Old Sorrento Valley Rd)

Looking West

Original Ground

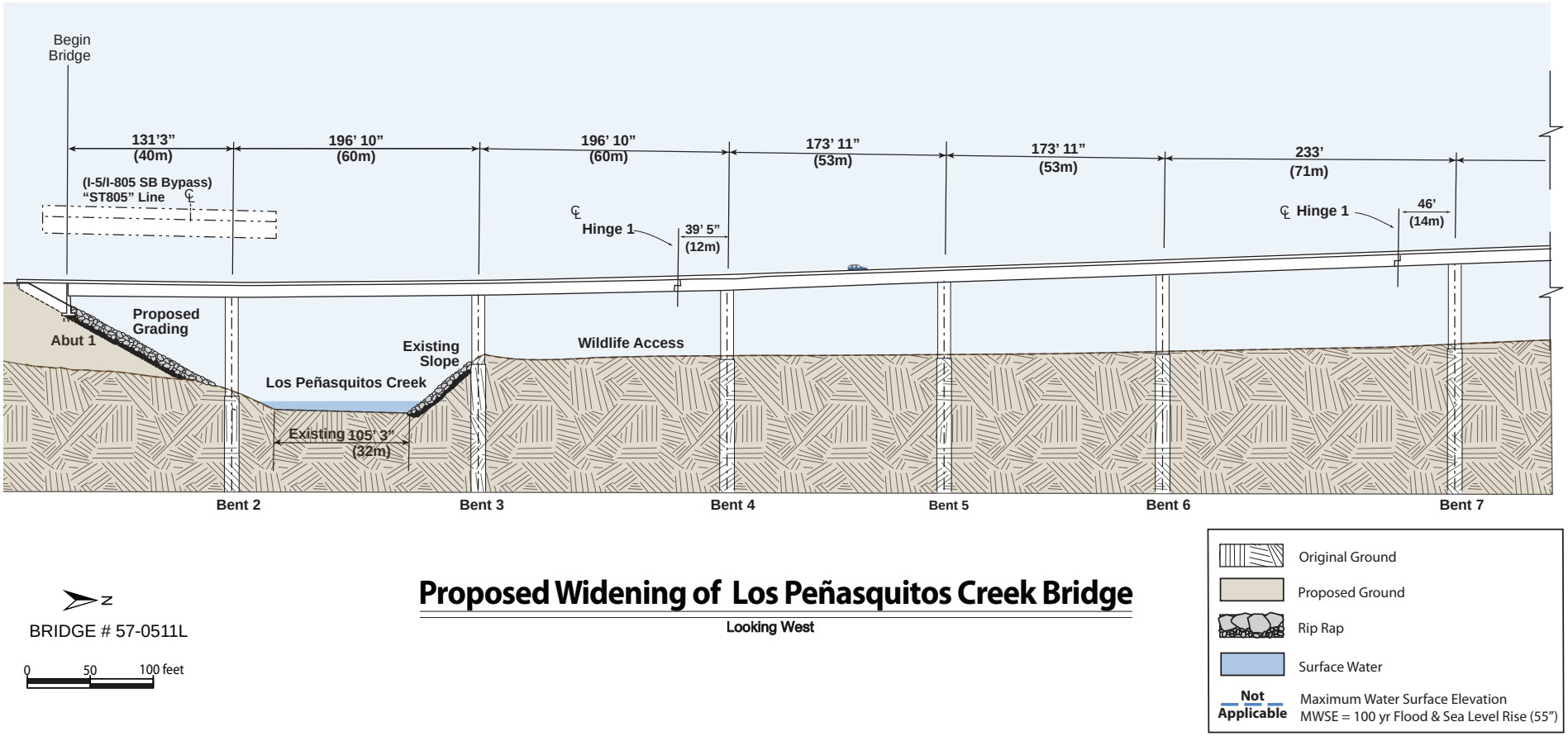
Proposed Ground

Proposed Rip Rap

Surface Water

Maximum Water Surface Elevation
MWSE = 100 yr Flood & Sea Level Rise (55")

Figure 3-1.1b: Los Peñasquitos Lagoon: Cross-sections for the Existing I-5 Bridge and Proposed 8+4 Buffer (Carmel Creek)



Proposed Widening of Los Peñasquitos Creek Bridge

Figure 3-1.1c: Los Peñasquitos Lagoon: Cross-sections for the Existing I-5 Bridge and Proposed 8+4 Buffer (Los Peñasquitos Creek)

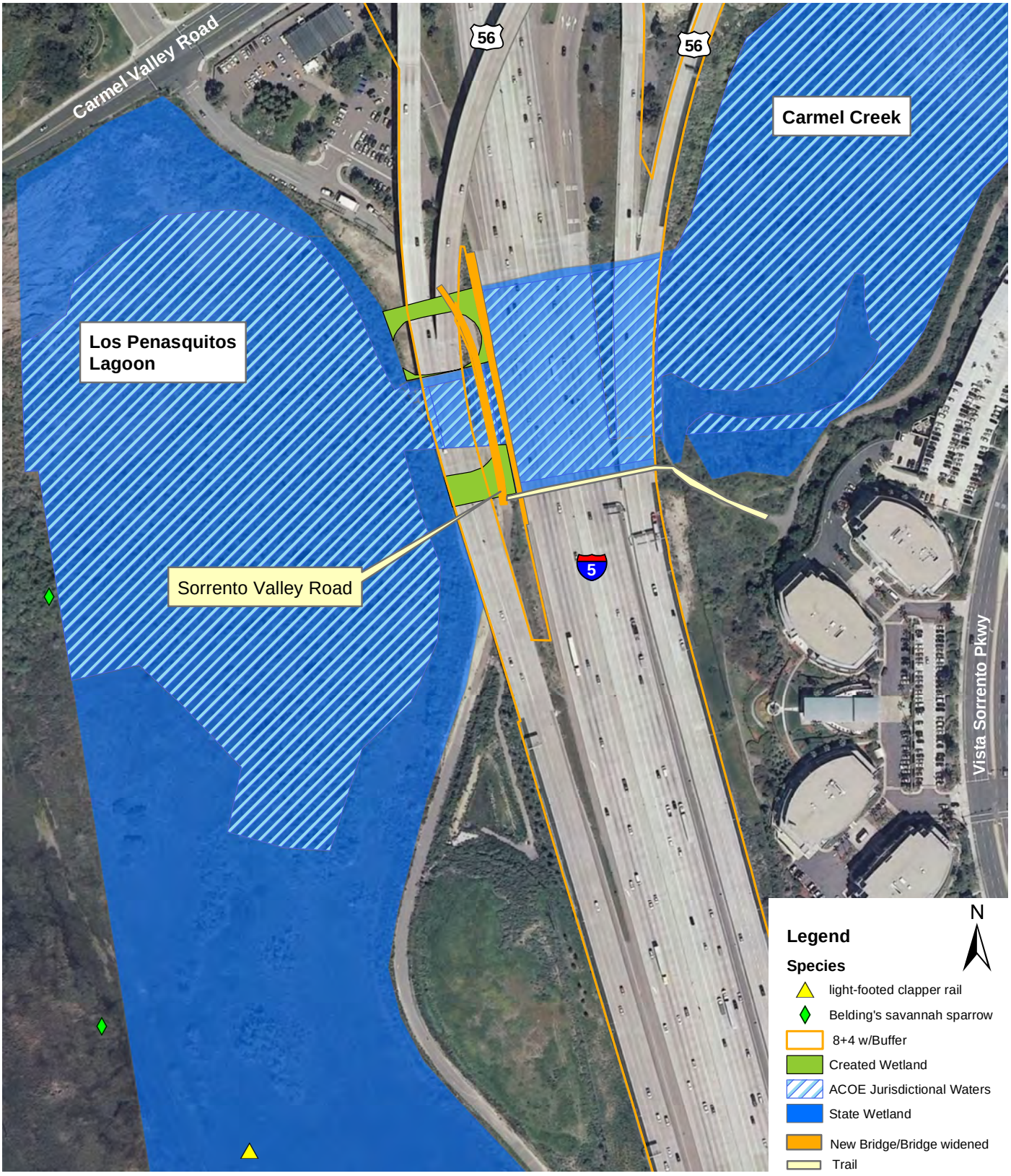


Figure 3-1.1d: Los Peñasquitos Lagoon: Permanent Impacts for the 8+4 Buffer (Carmel Creek)

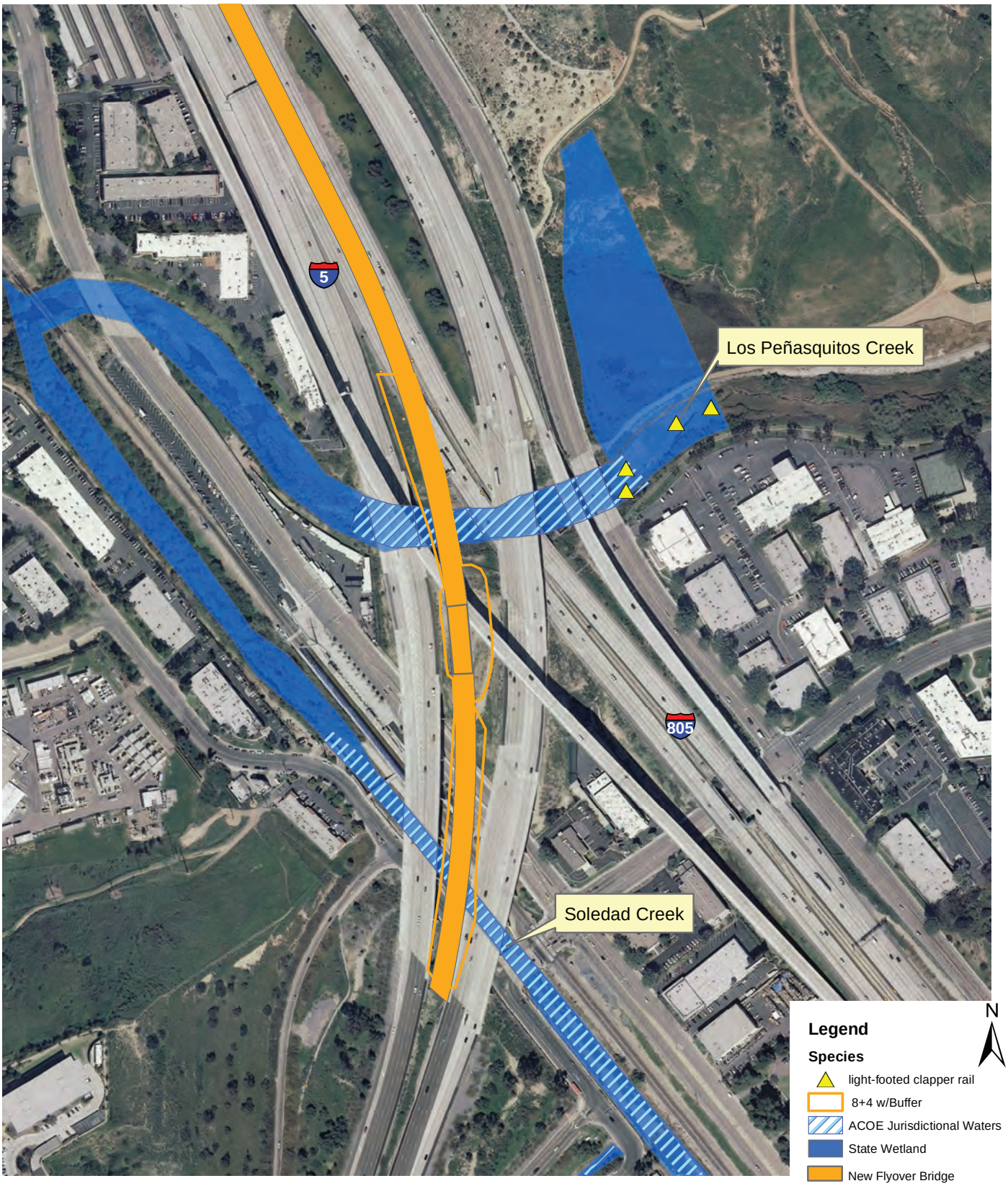


Figure 3-1.1e: Los Peñasquitos Lagoon: Permanent Impacts for the 8+4 Buffer (Los Peñasquitos and Soledad Creeks)

Figure 3-1.2a: San Dieguito Lagoon: Lagoon Setting

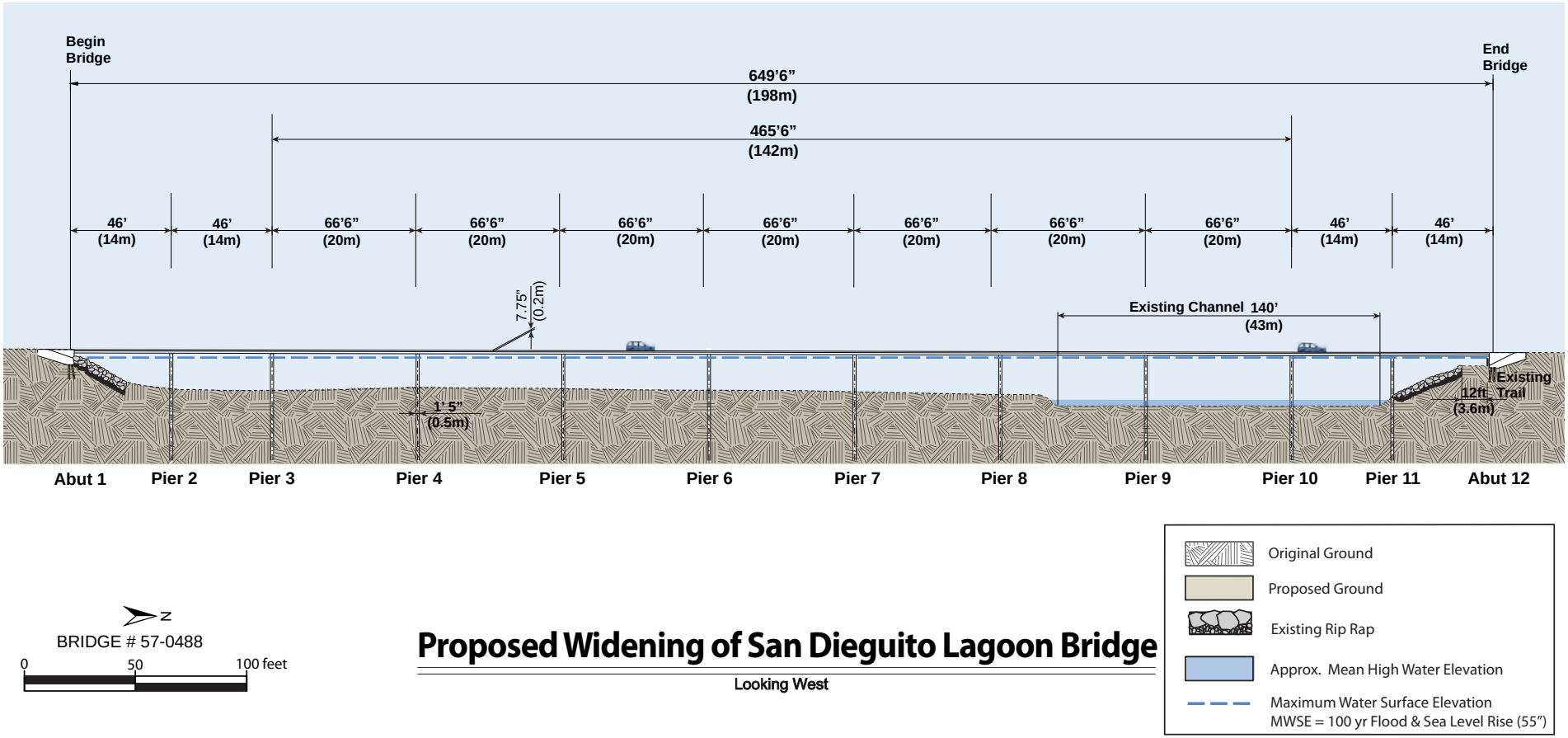


Figure 3-1.2b: San Dieguito Lagoon: Cross-sections for the Existing I-5 Bridge and Proposed 8+4 Buffer

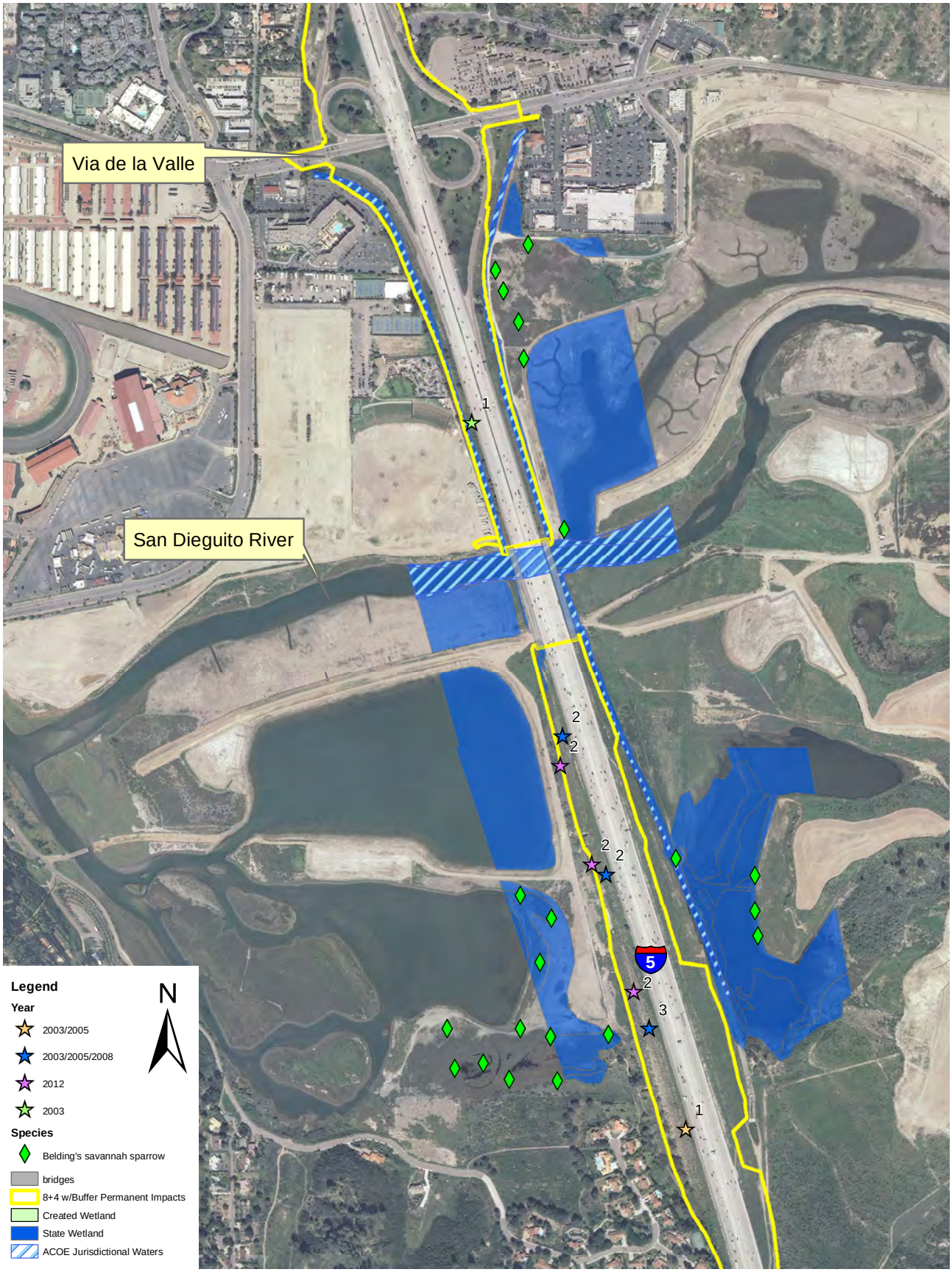


Figure 3-1.2c: San Dieguito Lagoon: Permanent Impacts for the 8+4 Buffer

Figure 3-1.3a: Agua Hedionda Lagoon: Lagoon Setting

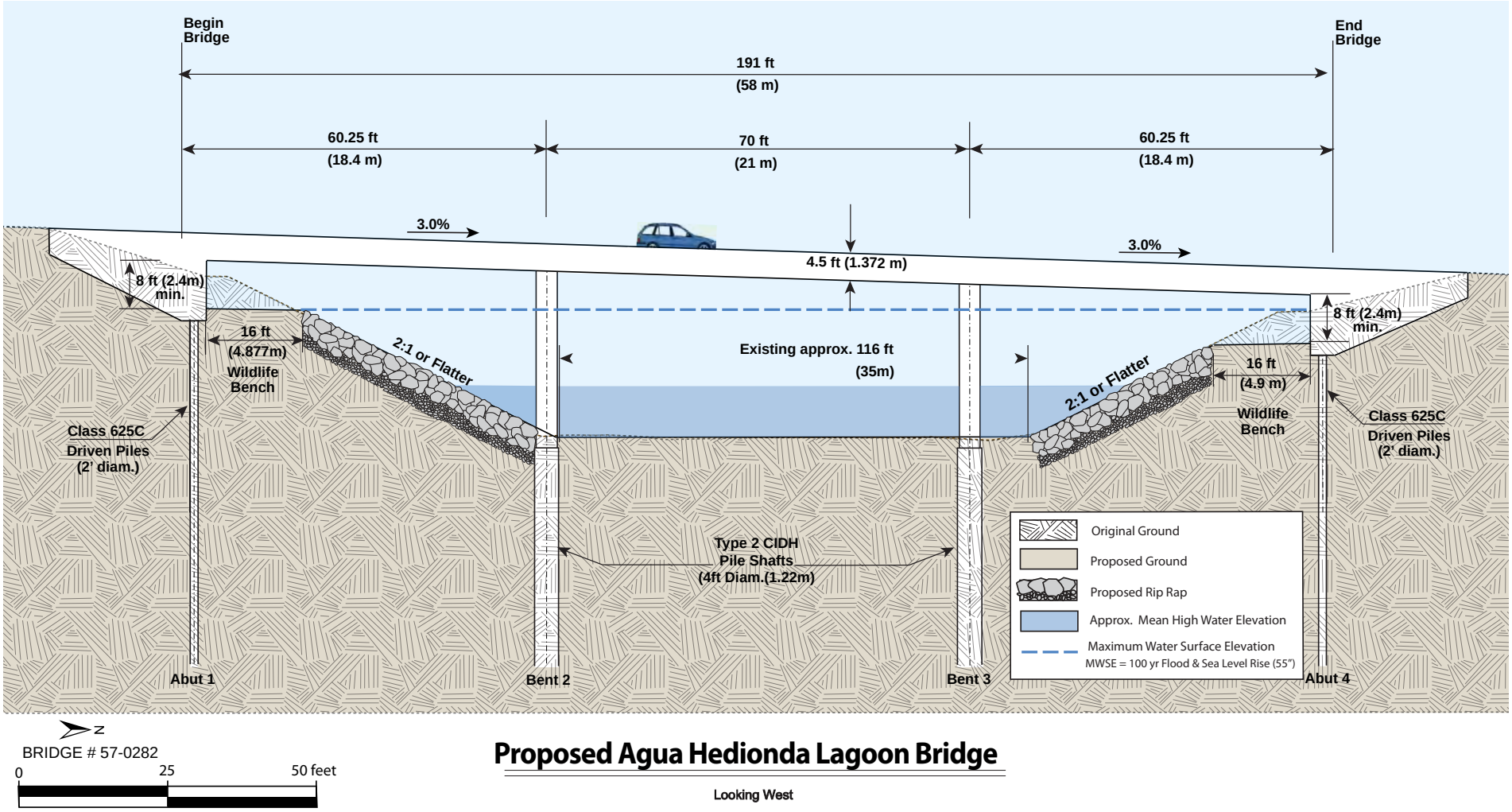


Figure 3-1.3b: Agua Hedionda Lagoon: Cross-sections for the Existing I-5 Bridge and Proposed 8+4 Buffer

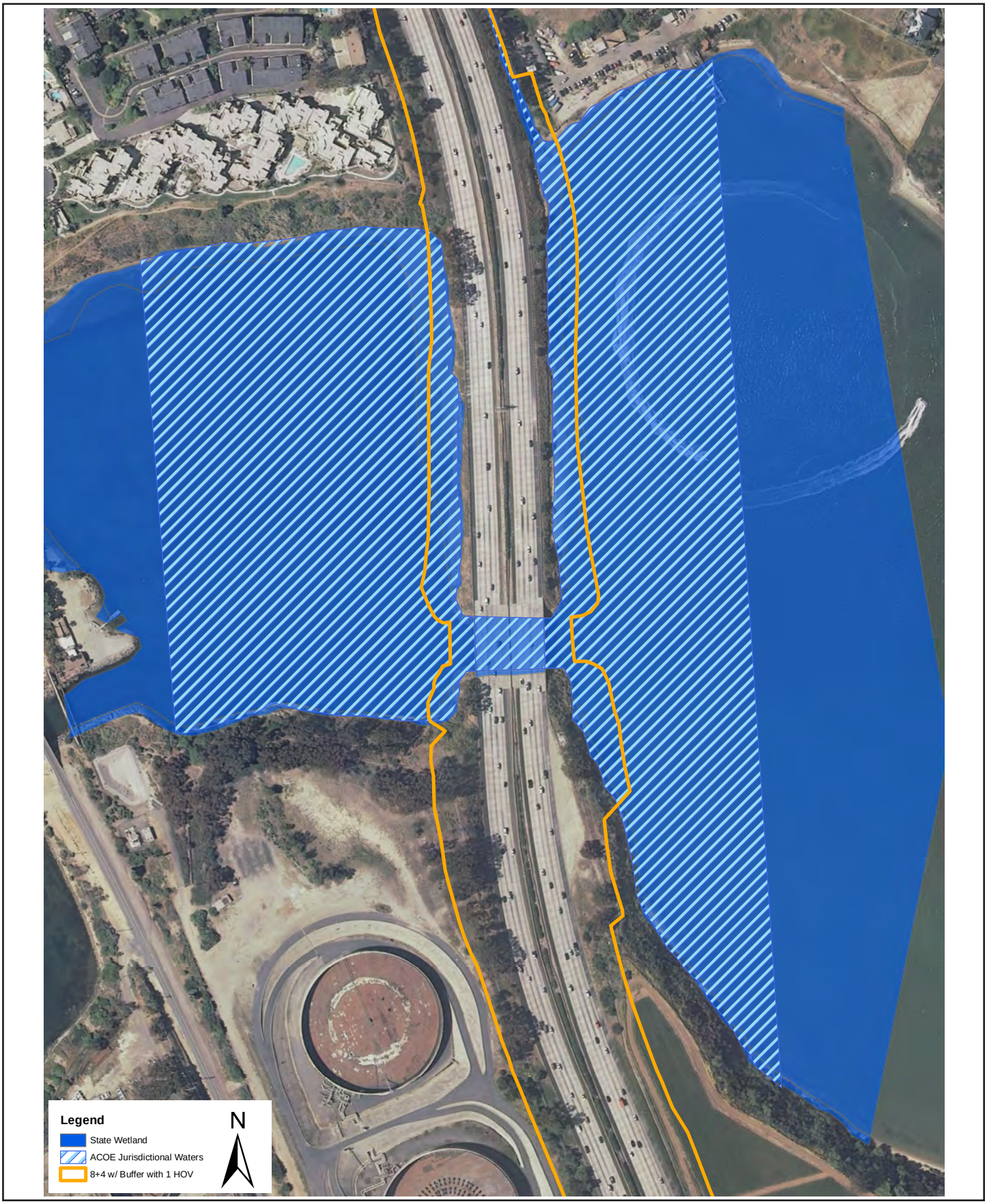
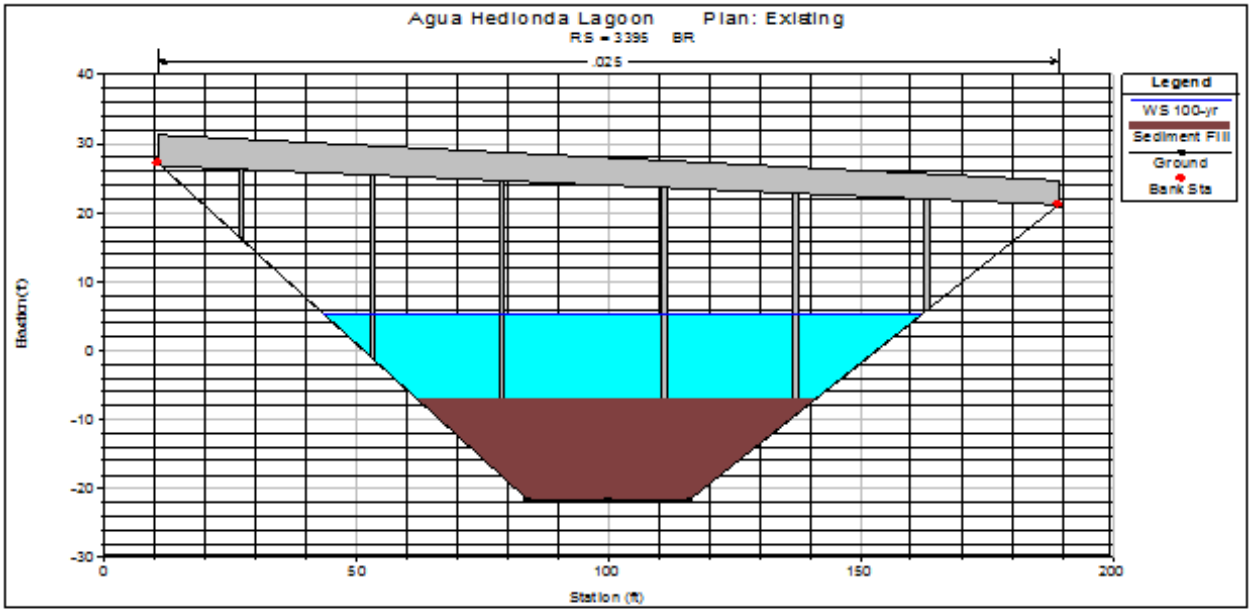


Figure 3-1.3c: Agua Hedionda Lagoon: Permanent Impacts for the 8+4 Buffer



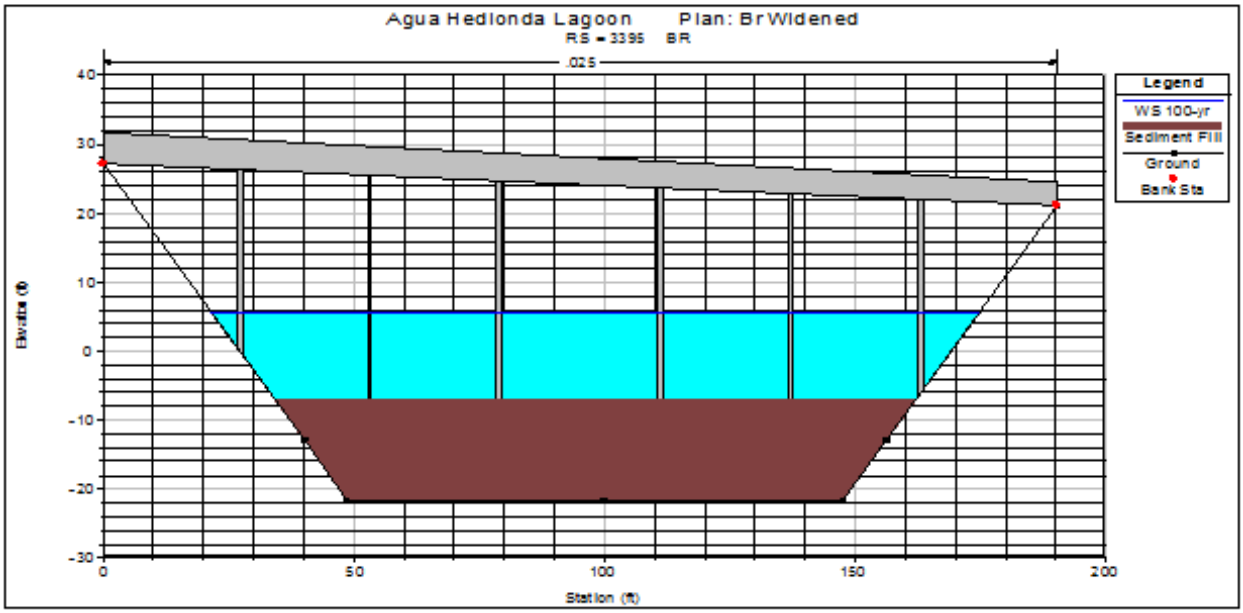


Figure 3-1.3d: Existing and Chang Channel Cross-sections

Figure 3-1.4a: San Elijo Lagoon: Lagoon Setting

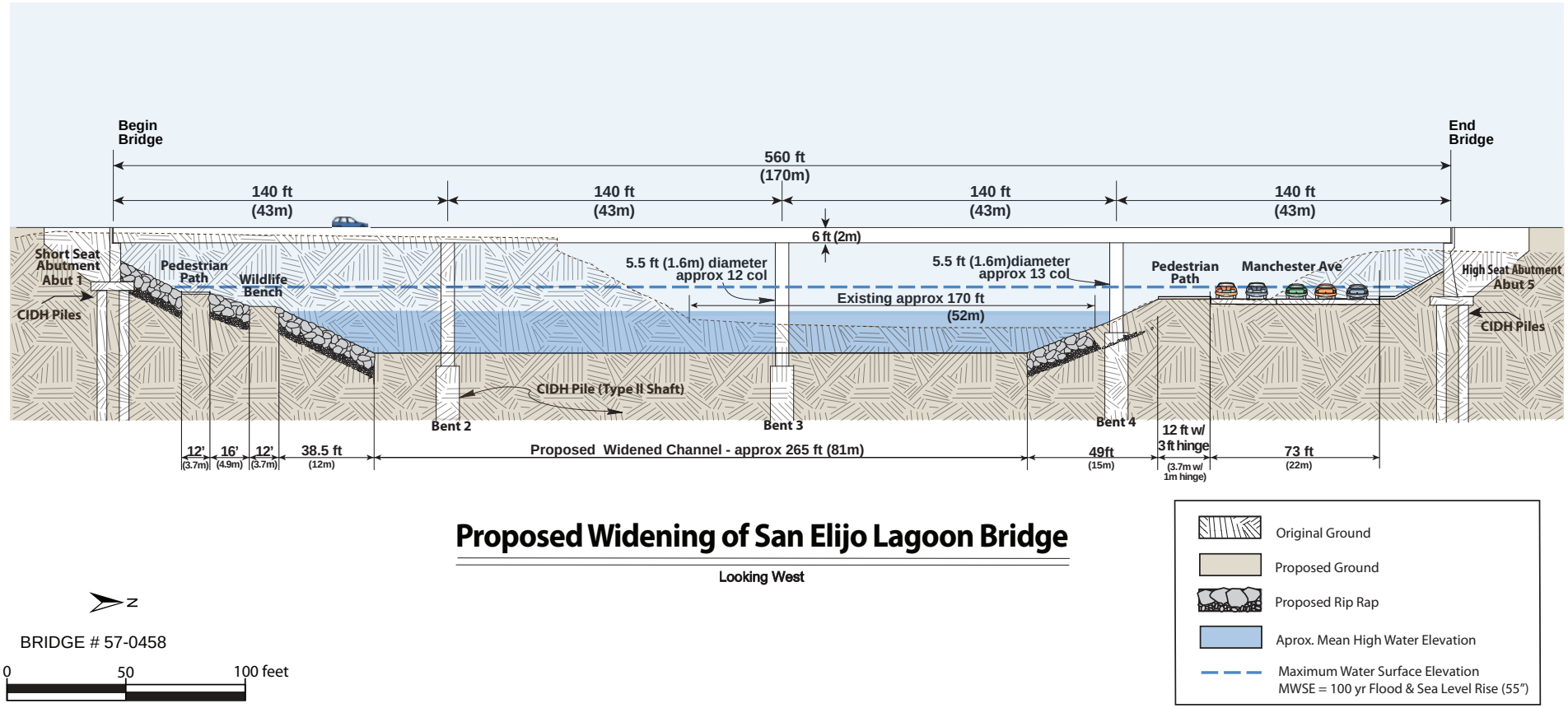


Figure 3-1.4b: San Elijo Lagoon: Cross-sections for the Existing I-5 Bridge and Proposed 8+4 Buffer

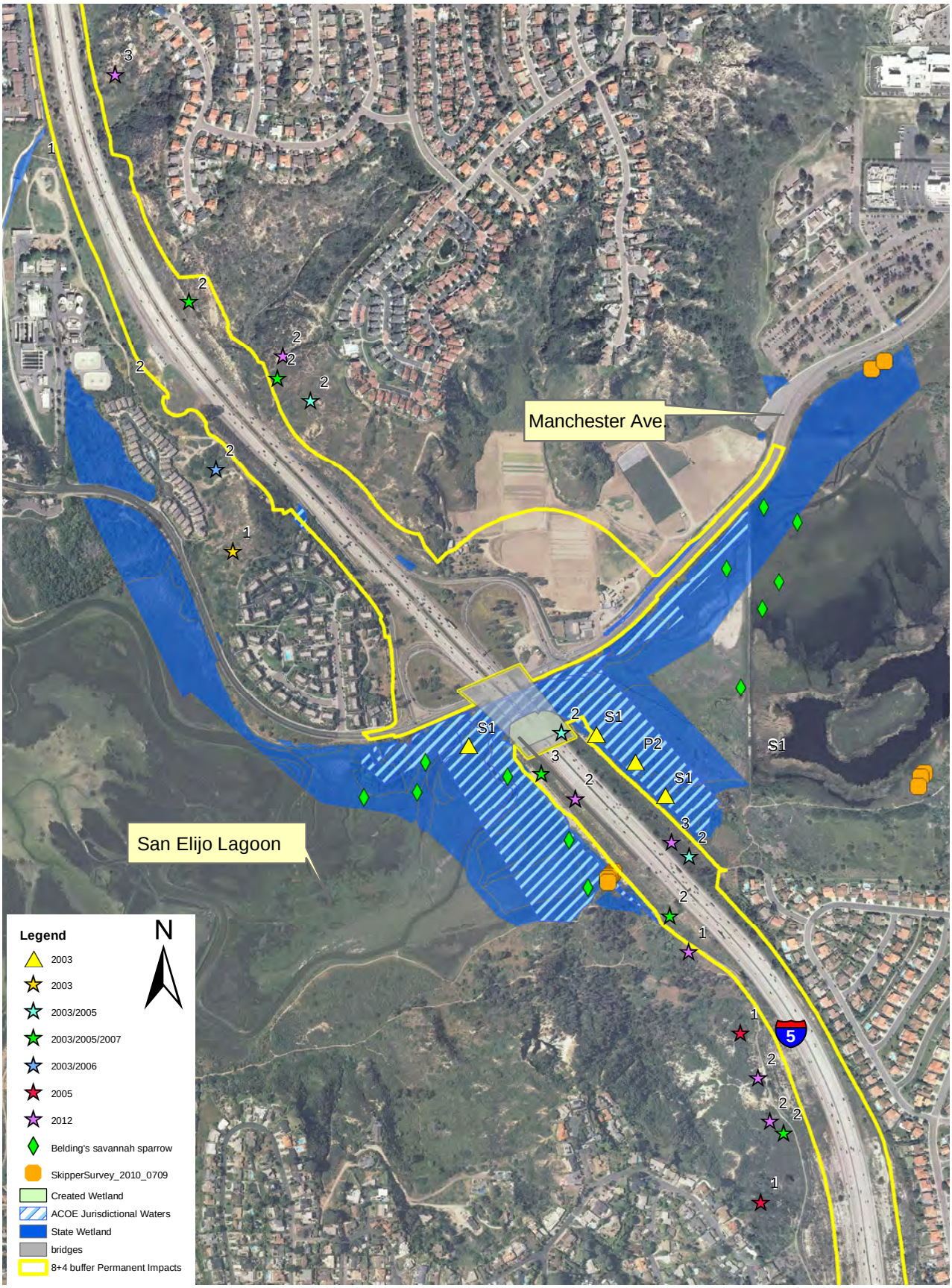


Figure 3-1.4c: San Elijo Lagoon: Permanent Impacts for the 8+4 Buffer

Figure 3-1.5a: Batiquitos Lagoon: Lagoon Setting

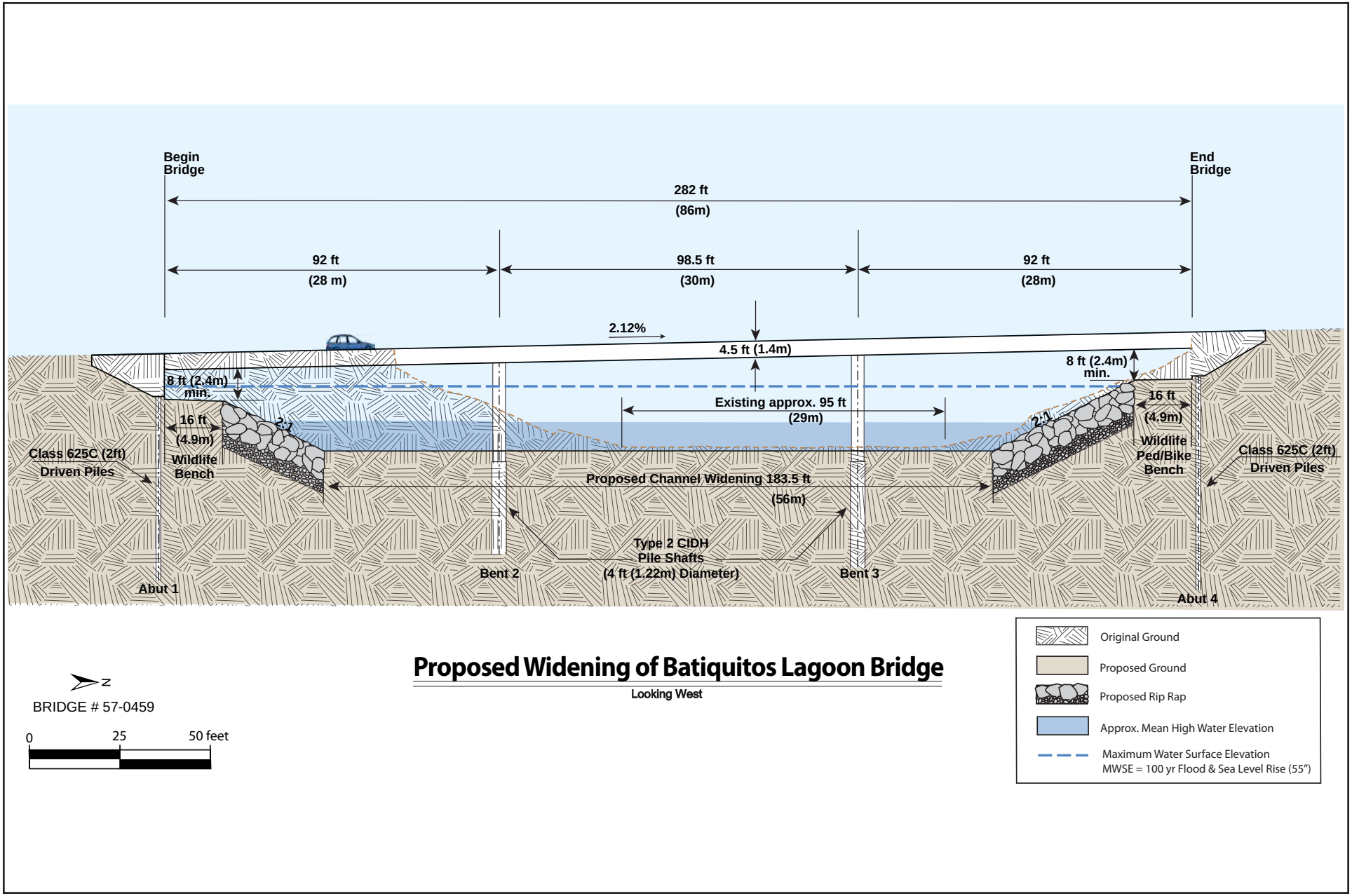


Figure 3-1.5b: Batiquitos Lagoon: Cross-sections for the Existing I-5 Bridge and Proposed 8+4 Buffer

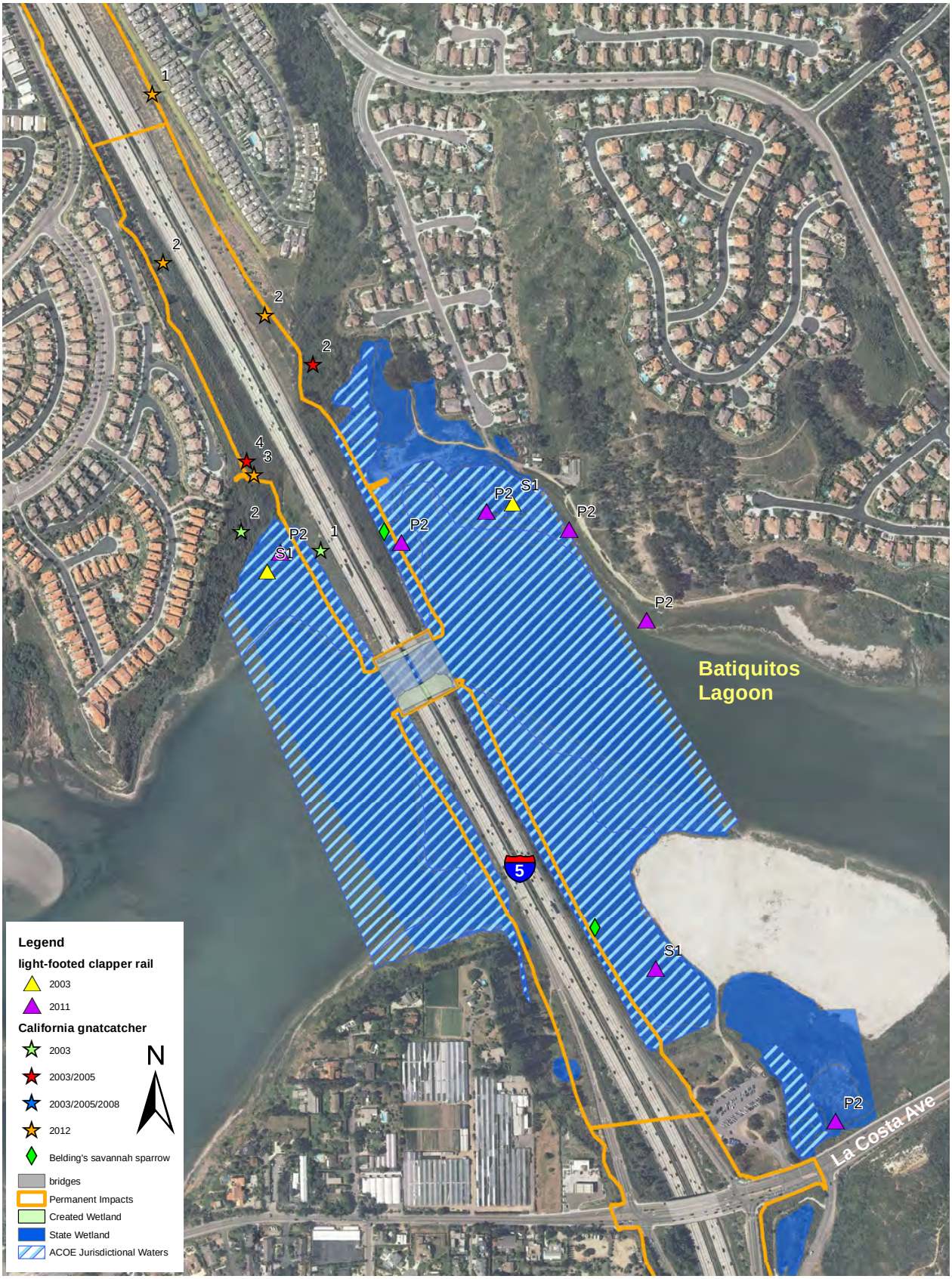
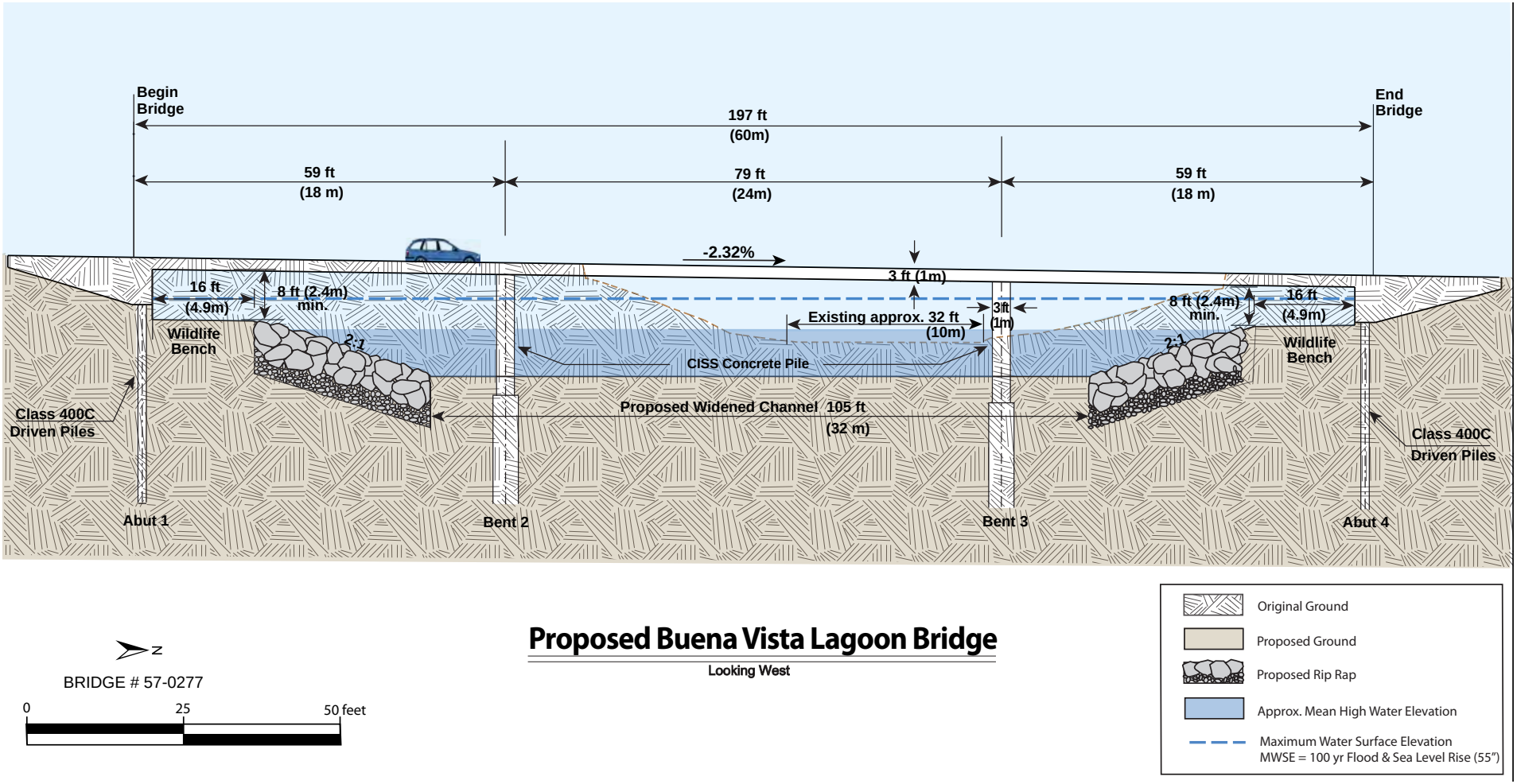


Figure 3-1.5c: Batiquitos Lagoon: Permanent Impacts for the 8+4 Buffer

Figure 3-1.6a: Buena Vista Lagoon: Lagoon Setting



Proposed Buena Vista Lagoon Bridge

Looking West

N

BRIDGE # 57-0277

0 25 50 feet

Figure 3-1.6b: Buena Vista Lagoon: Cross-sections for the Existing I-5 Bridge and Proposed 8+4 Buffer

Figure 3-1.6c: Buena Vista Lagoon: Permanent Impacts for the 8+4 Buffer

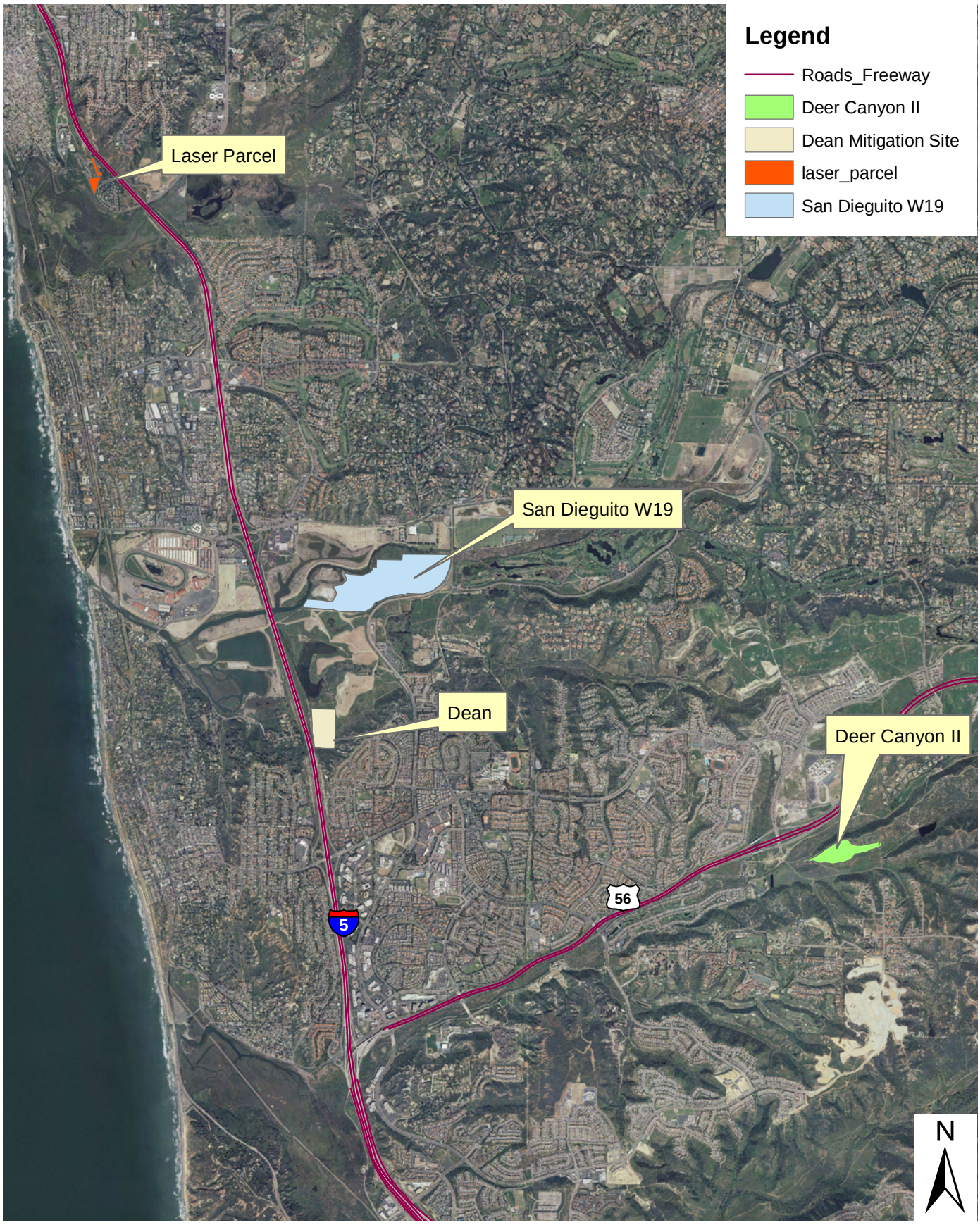


Figure 3-1.7: Mitigation Parcels within the Los Peñasquitos, San Dieguito, and San Elijo Watersheds

Figure 3-1.8: Mitigation Parcels within the Batiquitos and Agua Hedionda Watersheds

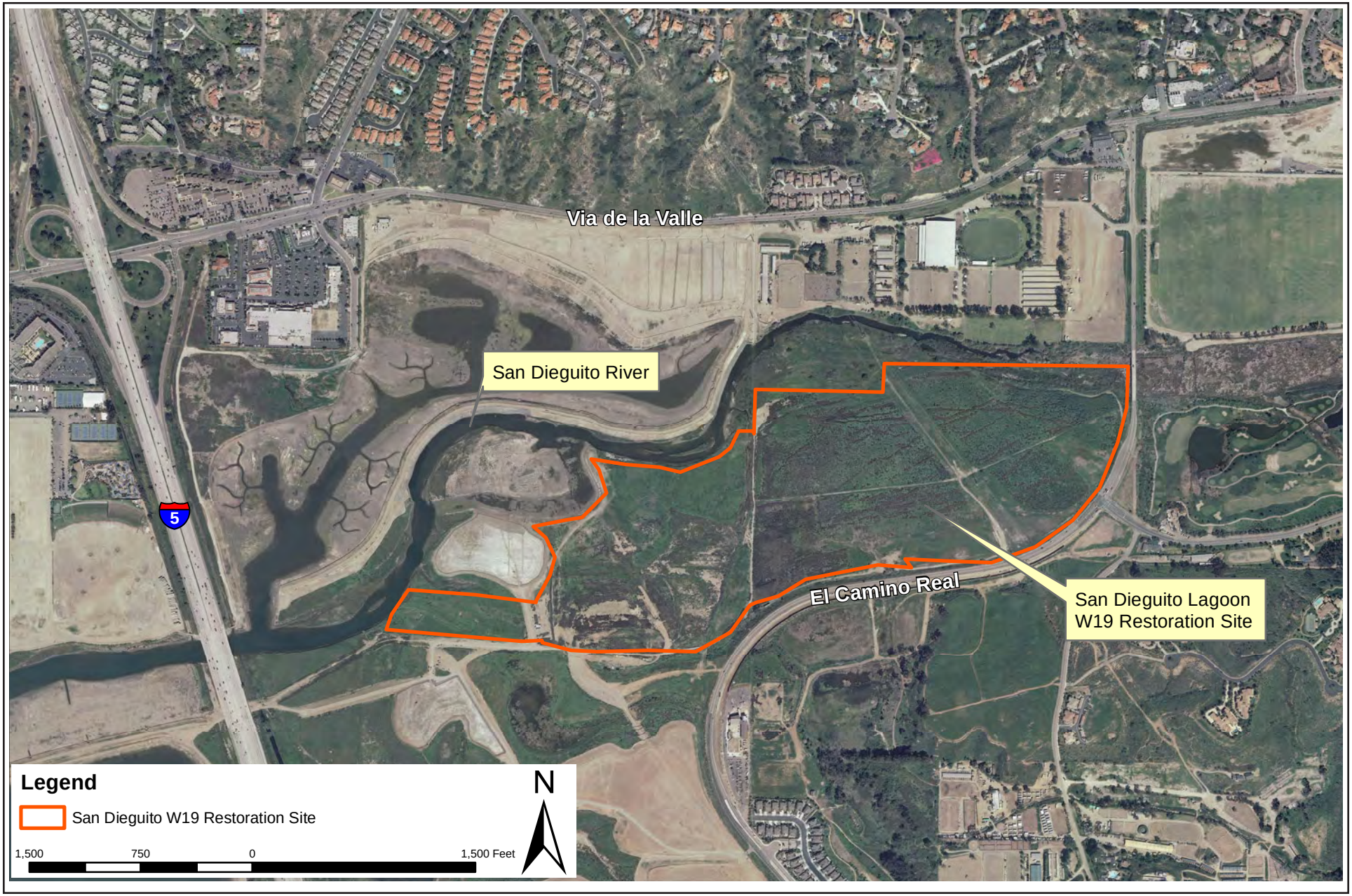


Figure 3-1.9: San Dieguito Lagoon W19 Mitigation Site

Figure 3-1.10: Hallmark Mitigation Sites

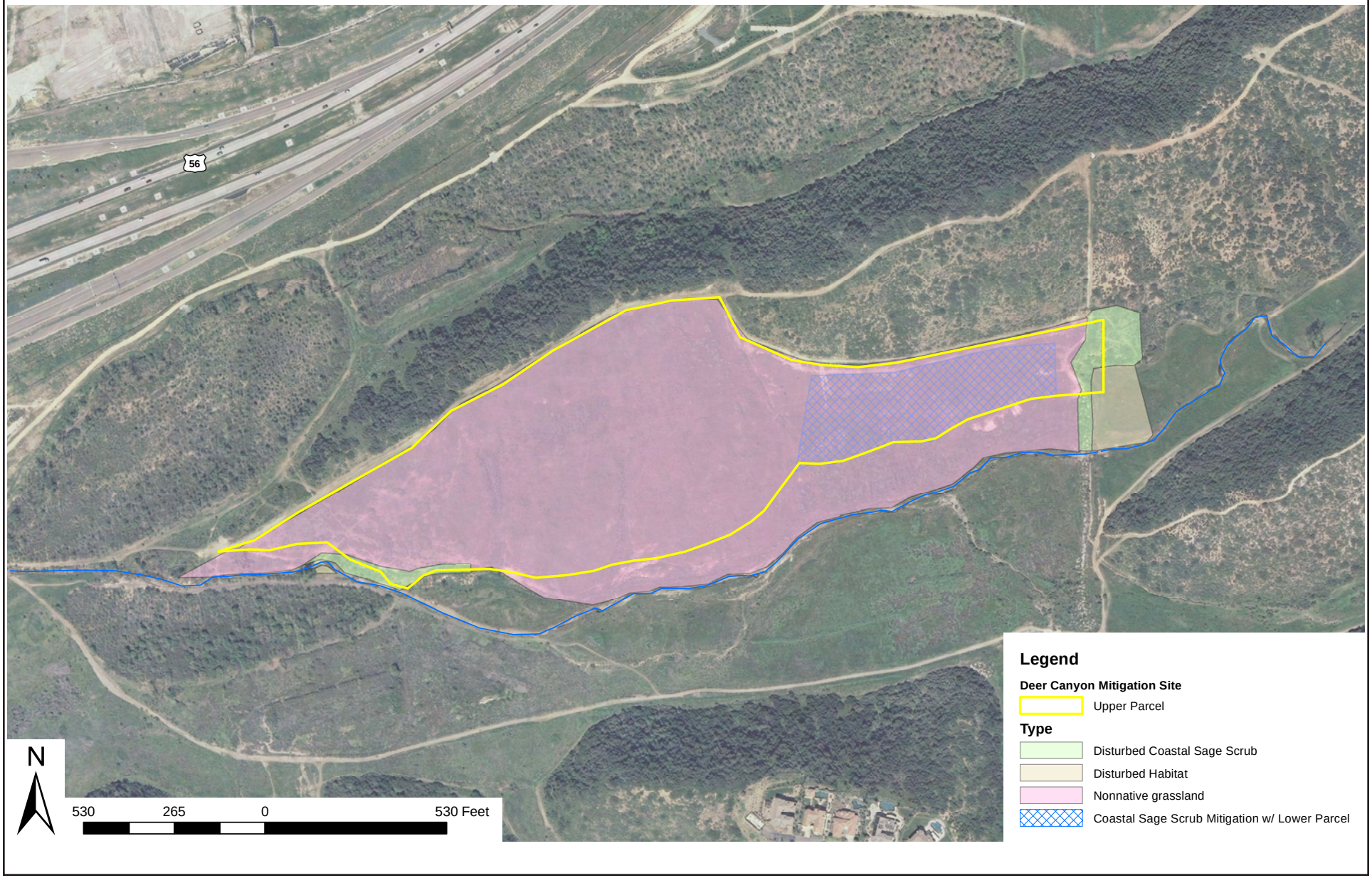


Figure 3-1.11: Deer Canyon Mitigation Site

Figure 3-1.12: Dean Mitigation Site

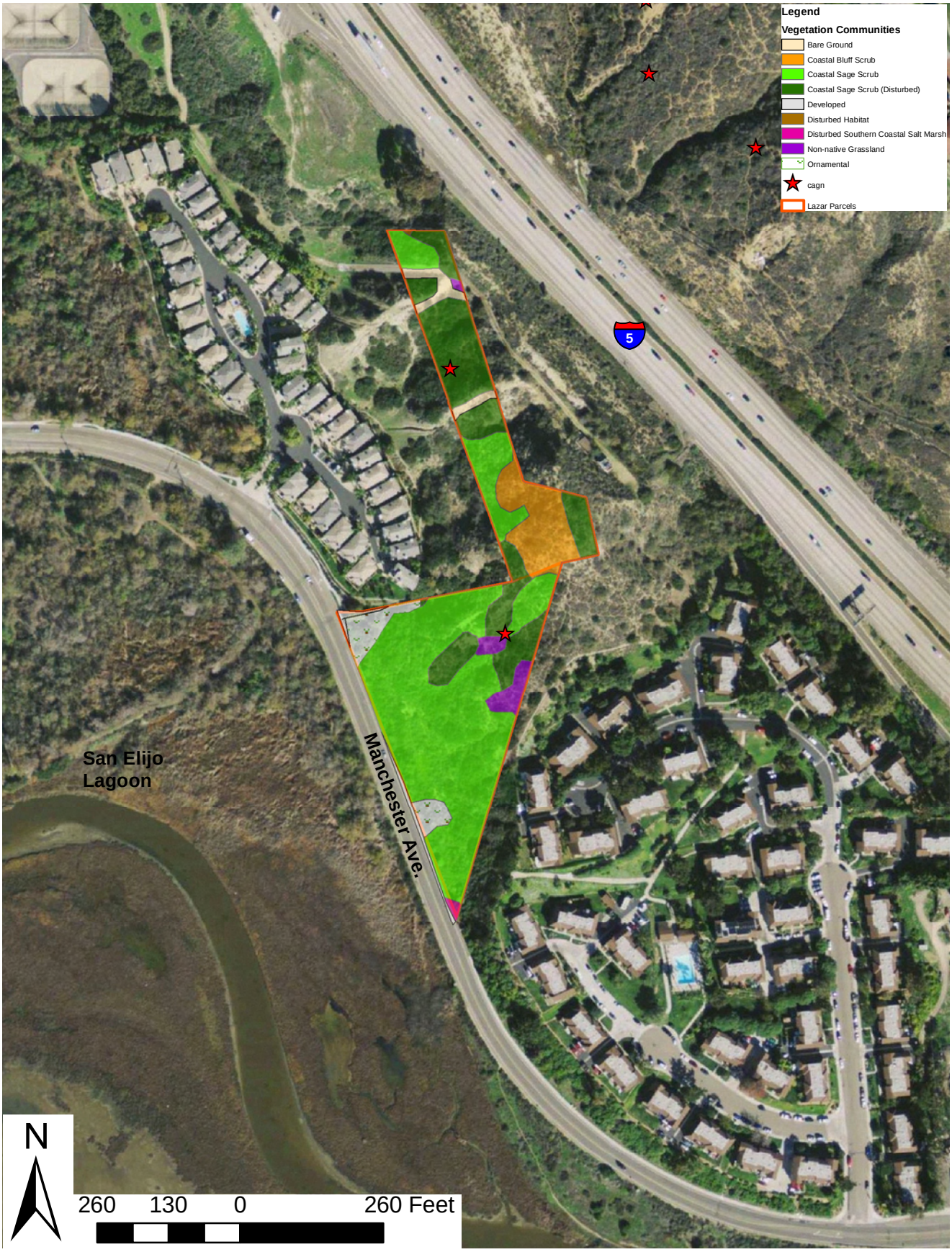


Figure 3-1.13: Laser Mitigation Site

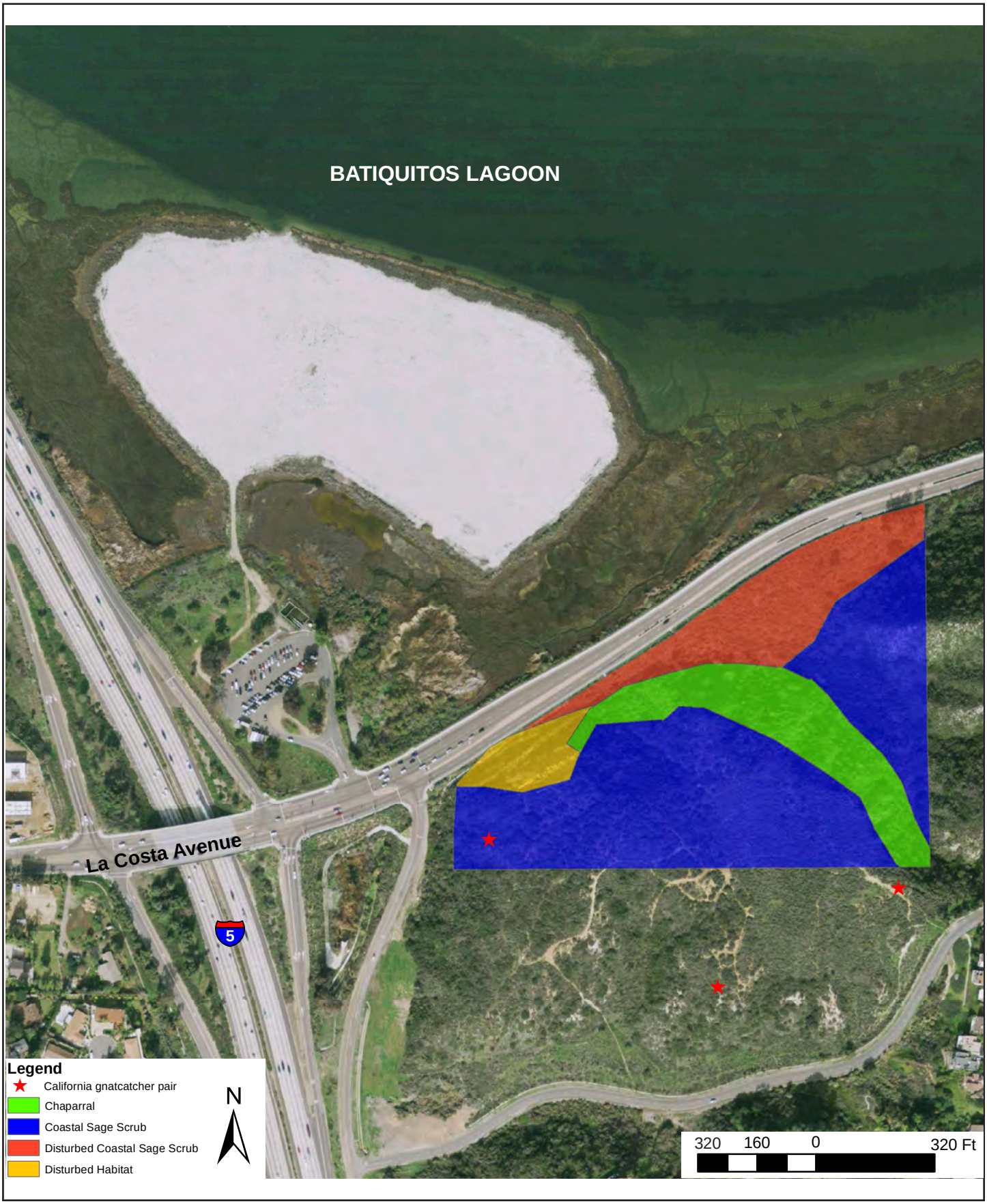


Figure 3-1.14: La Costa (Ayub) Mitigation Site

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3.2 PROJECT DESIGN MEASURES/ADAPTATION MANAGEMENT STRATEGIES FOR SEA LEVEL RISE

On November 14, 2008, Governor Schwarzenegger signed Executive Order S-13-08 (EO S-13-08), which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This Executive Order mobilized several agencies and actions to address the concern of sea level rise (SLR).

The California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop *The California Climate Adaptation Strategy* (December 2009), which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08, which specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, SLR, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continue to be developed and collected, the state's adaptation strategy would be updated to reflect current findings.

The Resources Agency was also directed to request the National Academy of Science to prepare a Sea Level Rise Assessment Report by December 2010 (not yet prepared) to advise how California should plan for future SLR. The report is to include:

- Relative SLR projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates
- The range of uncertainty in selected SLR projections
- A synthesis of existing information on projected SLR impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems
- A discussion of future research needs regarding SLR

Prior to the release of the final Sea Level Rise Assessment Report, all state agencies planning to construct projects in areas vulnerable to future SLR were directed to consider a range of SLR scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to SLR. SLR estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data.

A recent study by the National Academy of Sciences has been released, that identifies SLR as reaching 37 inches. Prior to this, project optimization studies were completed based on interim guidance released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans. That guidance was more conservative, assuming 55 inches rather than 37 inches of SLR.

Studies completed in support of this Supplemental Draft EIR/EIS used the more conservative assumption of 55 inches, as shown below on *Table 3.2.1.*

All projects that have filed a Notice of Preparation (NOP) of an environmental document, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects as of the date of EO S-13-08 may, but are not required to, consider these planning guidelines. The NOP for the *I-5 NCC Project* was filed October 20, 2004. Though this project is exempt, SLR adaptive strategies have been considered.

Furthermore, EO S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level effects that could affect safety, maintenance and operational improvements of the system, and economy of the state. Caltrans continues to work on assessing transportation system vulnerability to climate change, including the effect of SLR.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. Without Statewide planning scenarios for relative SLR and other climate change impacts, however, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once Statewide planning scenarios become available, Caltrans would review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from SLR.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science report on Sea Level Rise Assessment which is due to be released in 2012.

In general, the State Highway System (SHS) is limited in its adaptive capacity because of the numerous services it facilitates, its permanent location, longitudinal nature, long lifespan, and uncertain resources. In determining whether to incorporate SLR into project programming and design, the following screening criteria should be considered:

- Project design life, 20+ years
- Redundancy/alternative routes
- Anticipated travel delays
- Good movement/interstate commerce
- Evacuations/emergencies
- Traveler safety, in delaying the project to incorporate SLR design
- Expenditure of public funds
- Scope of project
- Interconnectivity issues with local streets and roads
- Environmental constraints, i.e., increase in project footprint into environmentally sensitive areas

The Ocean Protection Council adopted Statewide SLR values (Table 3.2.1), and an SLR interim guidance document in March 2011. Caltrans participated in the development of this first set of statewide SLR scenarios. This common set of values allows all State agencies to plan for SLR with the same assumptions. This document would be revised when the NAS releases their final

SLR values, but in the interim, provides a standardized set of assumptions to use when determining SLR impacts.

Table 3.2.1
SEA LEVEL RISE PROJECTIONS USING 2000 BASELINE

Year	Rise	Average of Models	Range of Models
2030	--	7 inches (18 cm)	5-8 inches (9-17 cm)
2050	--	14 inches (36 cm)	10-17 inches (26-43 cm)
2070	Low	23 inches (59 cm)	17-27 inches (43-70 cm)
	Medium	24 inches (62 cm)	18-29 inches (46-74 cm)
	High	27 inches (69 cm)	20-32 inches (51-81 cm)
2100	Low	40 inches (97 cm)	31-50 inches (78-128 cm)
	Medium	47 inches (121 cm)	37-60 inches (95-152 cm)
	High	55 inches (140 cm)	43-69 inches (110-176 cm)

For dates after 2050, *Table 3.2.1* includes three different values for SLR; based on low, medium, and high greenhouse gas emission scenarios. These values are based on the Intergovernmental Panel on Climate Change emission scenarios as follows: B1 for low projections, A2 for medium projects, and A1F1 for high projections.

The projected values in *Table 3.2.1* show narrow ranges of rise for the relative short term and increasing ranges for time frames farther into the future. The scenarios predict fairly consistent values in the short term, but increasingly wide ranges of value in the longer term due to increasing uncertainty. These projections vary depending upon how quickly the international community reduces greenhouse gas emissions. There is no specific probability of occurrence for any of the projected scenarios—they represent different possible global climate conditions and the amount of projected SLR for the respective conditions.

Predicted Consequences of Sea Level Rise on the I-5 NCC Project

Sections 3.1.1 and *3.1.2* of this chapter discuss lagoon and creek crossing hydrology/hydraulics, including the impacts anticipated during the 100-year flood event and projections of SLR for 2100. Preliminary design studies indicate ample freeboard to accommodate the 100-year flood event and projected 2100 SLR at all water crossings except Carmel Creek. At that location, there would be a deficiency of 0.7 foot of freeboard during a 100-year flood event. This represents a temporary build up of water east of I-5, however, and freeway access would be anticipated to be maintained. As shown in *Table 3.2.1* above, SLR in this area could be 55 inches, or approximately 4.5 feet.

Application of the Screening Criteria to the I-5 NCC Project

In considering the screening criteria in *Table 3.2.1,* the project design life is expected to be approximately 40 years (to 2050). I-5 is a critical route for commercial goods movement.

In the (unexpected) event that a tidal event inundates the freeway, there are several alternative routes to I-5 in this area. El Camino Real, less than a mile east of the freeway, is a parallel north-south route. Further east, I-15 is connected to I-5 by several local streets, as well as the SR-56, SR-76, and SR-78 freeways. These facilities could also serve as evacuation routes, if needed. The ITS elements of the existing facility and those proposed as part of the *I-5 NCC*

Project, would improve real time responses to emergency situations. The anticipated travel delay from an event would be minor to moderate, lasting from a few hours to possibly a few days.

The addition of a new structure and raising the freeway approaches to the new structure would add millions to the project and ongoing additional maintenance for this area also would be incurred to support the raised approaches to the structure. It would also necessitate reconstructing portions of Carmel Valley Road west and east of the project, Sorrento Valley Road to the west, and possibly reconstructing the connections of El Camino Real and SR-56 to Carmel Valley Road. In addition to the above design and cost consideration, the redesign would increase the project footprint in the Carmel Valley area. The project would likely encroach into the habitat of CVREP to the west and Los Peñsaquitos Lagoon to the west. It could also impact existing businesses immediately east of the freeway.

Further delays to implementing the project would cause longer travel times, increase congestion and possibly lead to additional accidents.

Adaptation Strategies

Adaptation strategies to reduce the deficiency include removing existing sediment under the existing bridge at Carmel Valley Creek and temporary freeway closures. Alternative routes exist so that traffic could be rerouted during periods of minor to moderate inundation. Based on the results from the screening criteria discussion, the adaptation strategies are considered appropriate for the risk level identified.

3.3 WATER QUALITY

Project implementation would result in the construction of new impervious (pavement) areas. As described in Section 3.10, *Water Quality and Storm Water Runoff*, of the Draft EIR/EIS, a potential increase in concentration of the targeted design constituents may be generated as a result of project construction, maintenance, and operation. The potential discharge of these constituents could affect downstream receiving waters, including 303(d)-listed impaired water body segments as in *Table 3.3.1*, which is updated from *Table 3.10.5* of the Draft EIR/EIS. A number of existing treatment BMPs are present within the project limits, including biofiltration swales and strips, extended detention facilities, wet basins, and media filters; with these facilities providing treatment for runoff from associated paved areas within the I-5 corridor. The percentage of runoff that is currently treated is approximately 15 percent. The LPA could potentially modify drainage and alter some of the existing treatment tributary areas.

Table 3.3.1
PROJECT AREA CWA SECTION 303(D) LIST OF WATER QUALITY LIMITED SEGMENTS & TDCS

303(d) Impaired Water Body	HSA	Constituents of Concern	TDCs
Los Peñasquitos Creek	906.10	Enterococcus, Fecal Coliform, Selenium, Total Dissolved Solids, Total Nitrogen as N, Toxicity	Nitrogen & Total Dissolved Solids
Los Peñasquitos Lagoon	906.10	Sedimentation Siltation	Sediment
Soledad Canyon Creek	906.10	Sediment Toxicity, Selenium	N/A*

Table 3.3.1 (cont.)
PROJECT AREA CWA SECTION 303(D) LIST OF WATER QUALITY LIMITED SEGMENTS & TDCS

303(d) Impaired Water Body	HSA	Constituents of Concern	TDCs
Pacific Ocean Shoreline/ San Dieguito HU	905.11	Total Coliform	N/A*
San Elijo Lagoon	904.61	Indicator Bacteria, Sedimentation Siltation & Eutrophic	Sedimentation/ Siltation
Buena Vista Lagoon	904.21	Indicator Bacteria, Sedimentation/ Siltation & Nutrients	Sedimentation/Siltation, Nutrients
Loma Alta Slough	904.10	Indicator Bacteria & Eutrophic	N/A*
Pacific Ocean Shoreline/ San Luis Rey HU	903.11	Enterococcus, Total Coliform	N/A*
San Luis Rey River	903.11	Enterococcus, Total Coliform, Total Nitrogen as N, Chloride, Phosphorus, Total Dissolved Solids	Nitrogen, Phosphorus, Total Dissolved Solids

Source: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml
http://www.stormwater.water-programs.com/wqpt/CoPM.asp?CO=SD&RTE=5
* Not determined to be a constituent found within Caltrans' storm water runoff monitoring program

The State Water Resources Control Board adopted Order No. 99-06–DWQ, NPDES No. CAS000003 NPDES Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Caltrans properties, facilities and activities. This permit requires Caltrans to implement a Storm Water Management Plan (SWMP); the purpose of which is to protect and achieve water quality standards at all times. The SWMP must ensure that pollutants in discharges from storm drain systems owned or operated by Caltrans are reduced to the maximum extent practicable (MEP) and that pollutants in discharges from construction activities covered by the General Construction Permit are reduced by employing Best Available Technology/Best Conventional Technology (BAT/BCT) performance standards. The MEP analysis is the process of evaluating the selected BMPs based on legal and institutional constraints, technical feasibility, relative effectiveness, and cost/benefit ratio. Storm water runoff from roadways and shoulders under the LPA or any of the other potential build alternatives, would drain into proposed approved treatment best management practice (BMP) facilities. The identified impact footprint, upon which treatment assumptions/ conclusions are based, includes the LPA, as well as a 12-foot-wide area on each side of the corridor to accommodate proposed BMPs (unless unavailable for reasons including right-of-way or environmental constraints).

Proposed Treatment BMPs

Proposed treatment BMPs are derived from approved (Category III) Caltrans measures (refer to *Table 3.3.2 below, which is Table 3.10.13* of the Draft EIR/EIS), and include, but are not limited to, a series of biofiltration swales (bioswales), biostrips, and detention basins. As noted above

and in *Section 3.10* of the Draft EIR/EIS, proposed treatment BMP siting locations and associated contributing drainage areas are based on the preliminary design concept, and would be further evaluated and modified during project development. Specifically, preliminary treatment BMP siting locations would be further assessed to determine feasibility of incorporation based on environmental and right-of-way constraints, compliance with design factors set forth in the Project Planning and Design Guide dated July 2010 (or any reissuance thereof), and cost considerations. Approved treatment BMPs proposed as part of the *I-5 NCC Project* would provide treatment of runoff from both existing and proposed pavement areas within the project corridor.

Table 3.3.2
BMP CATEGORIES AND DESCRIPTION

BMP Category	Description	Responsible Division for BMP Implementation
Category IA	Maintenance BMPs: litter pickup, toxics control, street sweeping, etc.	Division of Maintenance
Category IB	Design Pollution Prevention BMPs: permanent soil stabilization systems, etc.	Division of Design
Category II	Construction Site BMPs: temporary runoff control	Division of Construction
Category III	Treatment BMPs: Permanent treatment devices and facilities	Division of Design, Construction and Maintenance

Source: Statewide SWMP, Table 3.1, May 2003

Since 2001, projects built within the 27-mile project area were designed to not preclude any build alternatives for the *I-5 NCC Project*. Projects within the corridor constructed with the last five years have incorporated Treatment BMPs. Due to grading and hydraulics, some of the existing treated runoff from these projects would also treat a portion of the new proposed pavement. As the project progresses in the design phase, Caltrans staff would ensure that treatment areas are maximized and existing treatment BMPs are left in place, replaced in kind or replaced with the latest approved devices. During final design, specifics would be determined, such as the amount of acreage to be treated by the project, what treatment BMPs would drain to specifics watersheds and water bodies and whether existing or new treatment BMPs are incorporated to treat LPA runoff.

Impervious Surface

The existing and proposed amounts of impervious areas within the project limits were quantified based on average directional dimensions for general purpose lanes, with auxiliary lanes, median, and on- and off-ramps. As shown in *Table 3.3.3*, the LPA would result in approximately 249 acres of new paved area, with treatment to be provided for approximately 256 acres of the equivalent net new impervious area, which is 103 percent.

Table 3.3.3
EXISTING/PROPOSED PAVEMENT AND TREATED AREAS WITHIN THE LPA

Facility	Area[1]
Southbound Existing Pavement	216.2
Northbound Existing Pavement	223
Ramp Existing Pavement	126.8
Total Existing I-5 Pavement Area	**566**
Southbound New Pavement	93.5
Northbound New Pavement	96.6
Ramp New Pavement	25.4
Median New Pavement[2]	33.1[2]
Total New I-5 Pavement Area	**248.6**
Total Treated Pavement Area	**256**
Percent of New Pavement Area Treated[3]	**103 Percent[3]**

[1] Acres unless otherwise noted.
[2] No existing pavement in median.
[3] The listed treatment percentage exceeds 100 percent, based on the fact that proposed treatment encompasses approximately 12.5 acres of existing paved area.

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Chapter 4

Comments and Coordination

CHAPTER 4 – COMMENTS AND COORDINATION

Ongoing coordination with the general public and appropriate public agencies is an essential part of the environmental process. The following summary documents the coordination for this supplemental to confirm impacts and benefits to the lagoons based on finalized studies, and to provide additional information supporting Draft EIR/EIS conclusions; as well as, ongoing discussion regarding the currently proposed Locally Preferred Alternative (LPA[1]). This participation is accomplished through a variety of formal and informal methods; including public input at project meetings and/or in response to environmental analysis in project CEQA/NEPA documents, project development team meetings, and interagency coordination meetings. The extensive outreach process prior to public circulation of the environmental document was described in Chapter 5, *Comments and Coordination*, of the Draft EIR/EIS.

Following public circulation and review of the Draft EIR/EIS, numerous comments were received from members of the public and representatives of public agencies regarding focused requests for:

- Updates on studies by others regarding North County lagoons that were in draft form or being implemented when the Draft EIR/EIS was released
- Clarification of impact and avoidance/minimization/mitigation specifics related to lagoons crossed by the I-5 right-of-way

This chapter summarizes coordination efforts related to lagoon studies and resolution of project-related issues between November 2010 and release of this document.

4.1 RESOURCE AGENCY CONSULTATION AND COORDINATION

Because of the focus on jurisdictional waters and associated sensitive species, this ongoing coordination is largely a continuation of Clean Water Act Section 404 integration process agency coordination; focused on continued technical analysis and design for which specific federal and State resource agencies are responsible under federal and State law (and documented in the Draft EIR/EIS). These agencies include the U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), U.S. Amy Corps of Engineers (ACOE), and National Oceanic and Atmospheric Association/National Marine Fisheries Service (NOAA/NMFS). As stated in Chapter 5 of the Draft EIR/EIS, under the Section 404 integration process these agencies are asked for: concurrence on the project purpose and need statement; identification of the range of alternatives, and consideration of the criteria used to select and analyze those alternatives; as well as identification of the Least Environmentally Damaging Practicable Alternative (LEDPA), and concurrence on the project conceptual mitigation plan. Identification of the LEDPA also will be discussed following circulation of this Supplemental Draft EIR/EIS and during preparation of the Final EIR/EIS.

Also as noted in the Draft EIR/EIS, although non-signatory agencies to the Section 404 integration process, the California Department of Fish and Game (CDFG), California Coastal Commission (CCC), and Regional Water Quality Control Board (RWQCB) were invited to consult. As the agency responsible for overall transportation planning (incorporating all local agency and special district plans into a cohesive overall plan), as well as management and disbursement of TransNet and other funding, the San Diego Association of Governments (SANDAG) also has been invited to participate in this multi-agency review.

[1] The FHWA has not identified an LPA under NEPA.

Coordination has included meetings, teleconferences, and receipt/review of written submittals to ensure that Caltrans is capturing all necessary elements brought forward by these agencies and members of the public. Coordination efforts occurring between circulation of the Draft EIR/EIS and release of this current document are summarized in *Table 4.1, Resource Agency Consultation and Coordination,* below.

Table 4.1
RESOURCE AGENCY CONSULTATION AND COORDINATION*

Date	Topic(s)
09/23/2010	Field review of the North Coast Corridor by Caltrans and EPA staff
10/28/2010	Dr. Michael Josselyn presented a summary of findings based on Phase 2 lagoon studies (Wetland Enhancement Opportunities Using the Hydrodynamic Approach by Optimization of Bridges Over San Diego Region Coastal Lagoons). Caltrans provided an update on the project and NEPA/404 Memorandum of Understanding (MOU) process
11/23/2010	Caltrans and EPA coordination regarding the Draft EIR/EIS
12/07/2010	Caltrans and EPA additional coordination regarding the Draft EIR/EIS
01/26/2011	Caltrans provided updates on the NEPA/404 MOU process and project Public Works Plan (PWP), and an overview of the Regional Transportation Plan (RTP). Discussion of the project Mitigation Plan. Caltrans requested concurrence on details of Encinitas Boulevard interchange improvements
03/30/2011	Discussion regarding scope of Supplemental Draft EIR/EIS (SDEIR/EIS) and the locally preferred alternative (LPA)
04/27/2011	Caltrans provided an update on the NEPA/404 MOU process and PWP, as well as an overview of the RTP. Discussion of the Mitigation Plan. Caltrans requested concurrence on details of the Encinitas Boulevard interchange improvements
06/01/2011	Concurrence reached on I-5/Encinitas Boulevard interchange improvements; update on NEPA/404 MOU process. Review of I-5 bridges, mitigation summary table information for 10+4 w/barrier and 8+4 w/buffer design alternatives, and a sample format for lagoon bridge summary analysis (using Agua Hedionda Lagoon Bridge). Discussion of the outline for the SDEIR/EIS
07/06/2011	Discussion of the LPA, project direct access ramps (DARs), and construction phasing
08/11/2011	Caltrans provided updates on optimization studies for the six lagoons, as well as the SDEIR/EIS and LPA refinement
09/15/2011	Agua Hedionda Lagoon discussion with focus on lagoon bridge summary matrix with justification for bridge lengths, and request for concurrence. Discussion of trails and opportunities at Agua Hedionda. Caltrans provided updates on bridge length optimization studies at the lagoons and on the SDEIR/EIS
11/09/2011	Review of other ongoing projects. Updates provided for I-5/Genesee, I-5/ SR-56, and I-5/Encinitas interchanges, the SDEIR/EIS, and bridge length optimization studies at the lagoons. Review of a mitigation site assessment template using the Hallmark property. Concurrence/approval received on the Agua Hedionda lagoon bridge matrix and justification paper. Presentation of Los Peñasquitos and San Dieguito bridge justification papers and matrices
12/15/2011	Review of mitigation site assessment template for Hallmark and La Costa properties, as well as bridge justification papers and matrices for San Dieguito, Los Peñasquitos, and Agua Hedionda Lagoons
01/19/2012	Review of SDEIR/EIS Chapter 1
02/16/2012	Review of SDEIR/EIS outline and revised project analysis key (summarizing agency comments and documents which address the response). Discussion of agency comments on SDEIR/EIS Chapter 1. Presentation of I-5 North Coast Bikeway concept and discussion of Carmel Creek field trip
02/29/2012	Caltrans and USEPA coordination regarding topics to be covered in the SDEIR/EIS

Table 4.1 (cont.) RESOURCE AGENCY CONSULTATION AND COORDINATION*	
Date	**Topic(s)**
04/12/2012	Agencies provided comments on the SDEIR/EIS and team discussion of document content continued
05/02/2012	Caltrans and ACOE coordination regarding LEDPA and ACOE permit
05/24/2012	Review of project mitigation package and mitigation parcel evaluations
06/21/2012	Continued discussion of Resource Enhancement Program (REP)/project mitigation package, introduction of Draft Design Guidelines
07/19/2012	Continued discussion of REP/project mitigation package

* Unless otherwise specified, each meeting was attended by staff from each of the following agencies: ACOE, CCC, CDFG, EPA, NOAA/NMFS, RWQCB, SANDAG, and USFWS.

4.2 ADDITIONAL CONSULTATION AND COORDINATION

Meetings have also occurred with North Coast Corridor (NCC) stakeholder groups to provide project information, address project status, and obtain specific input on issues under their purview. These meetings are summarized in *Table 4.2, Stakeholder Outreach and Coordination,* below.

Table 4.2 STAKEHOLDER OUTREACH AND COORDINATION		
Date	**Organization**	**Topic(s) and/or Purpose of Meeting**
04/22/2011	Quarterly Stakeholders Group	Meeting with NCC stakeholders
05/06/2011	Equinox Center Symposium	I-5 debate between Senator Kehoe and Laurie Berman of Caltrans
06/24/2011	Quarterly Stakeholders Group	Meeting with NCC stakeholders
09/13/2011	San Diego Regional Chamber of Commerce	Presentation to the Public Policy Committee
10/17/2011	City of San Diego, District 1	Team briefed councilmember on I-5 / Genesee interchange project, as well as NCC program
10/25/2011	Carlsbad Chamber of Commerce	Presentation to Land Use and Transportation Committee
11/01/2011	California Coastal Commission	Briefing with executive director
11/01/2011	California Coastal Commission	Presentation to Road's Edge Subcommittee
11/07/2011	Caltrans	Briefing with director on upcoming coastal permit process and role of outreach
11/17/2011	Leadership North County	Presentation to Land Use and Transportation Committee
12/01/2011	Oceanside Chamber of Commerce	Presentation to the Public Policy Committee
01/05/2012	San Diego North Economic Development Council	Meeting with Public Policy Committee
01/10/2012	Batiquitos Lagoon Foundation	Meeting with Foundation president to discuss NCC status and next steps
01/10/2012	San Dieguito River Park	Meeting with deputy director to discuss NCC status and next steps

Table 4.2 (cont.)
STAKEHOLDER OUTREACH AND COORDINATION

Date	Organization	Topic(s) and/or Purpose of Meeting
01/12/2012	Golden Triangle Transportation Forum	Presentation made to forum participants about ongoing and proposed transportation projects in the area
01/13/2012	San Elijo Lagoon Conservancy	Briefing with Conservancy executive director about NCC status/next steps
01/19/2012	California State Assembly, District 74	Briefing with assembly member about NCC program
01/25/2012	California Senate, 39th District	Briefing with policy director of Senator Kehoe's office
01/30/2012	Prevent Los Angeles Gridlock Usurping the Environment (PLAGUE)	Briefing on NCC status/next steps
02/01/2012	California State Assembly, District 74	Materials requested during 1/19/2012 meeting with District 74 assembly member were provided
02/02/2012	Los Peñasquitos Lagoon Foundation	Meeting with California State Parks (lagoon stakeholder) and Foundation representative
02/03/2012	San Dieguito River Park	Briefing with executive director and the Citizens Advisory Committee on NCC status/next steps
02/07/2012	Agua Hedionda Lagoon Foundation	Presentation to executive director and the Board of Directors on NCC status/next steps
02/14/2012	City of San Diego, staff	Meeting regarding local coastal plan (LCP) process
02/15/2012	City of Oceanside, staff	Meeting regarding LCP process
02/15/2012	City of Del Mar, planning staff	Meeting with City planning manager regarding LCP process
02/17/2012	San Dieguito River Park	Briefing to Joint Powers Authority Board about NCC status/next steps
03/07/2012	California Coastal Commission	Presentation to the CCC about NCC status/next steps
04/04/2012	Buena Vista Lagoon Foundation	Briefing with Foundation executive director and president about NCC status/next steps

4.3 PUBLIC PARTICIPATION

In 2010, five public hearings were held to present details about the proposed project design, the alternatives being considered, and findings from the environmental studies, as identified in the Draft EIR/EIS prepared for the project. Verbal and written comments submitted at the hearings, as well as all other comments received during the public review period of the Draft EIR/EIS, will be addressed in full in the Final EIR/EIS. The hearings were held on the following dates and locations:

- July 27, 2010 at the Encinitas Community and Senior Center in Encinitas
- August 3, 2010 at the Westfield University Town Center Forum Hall in San Diego
- August 17, 2010 at the Faraday Center in Carlsbad
- August 24, 2010 at Skyline Elementary School in Solana Beach
- September 9, 2010 at the Oceanside High School Multipurpose Room in Oceanside

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Chapter 5

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Appendices

Appendix A:
List of Acronyms

Appendix A
List of Acronyms

%	Percent
ac	Acre(s)
ACOE	United States Army Corps of Engineers
a.m.	Morning
BEI	Bank enabling instrument
BMP	Best Management Practice
BRT	Bus rapid transit
CA	California
CA SB 468	California Senate Bill 468, Streets and Highways Code Sections 103 and 149.10 (Kehoe 2011)
Caltrans	California Department of Transportation
CCC	California Coastal Commission
CCTV	Closed circuit television
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CMS	Changeable message sign or cubic meter per second
Coast Highway	Pacific Coast Highway 101
CSMP	Corridor System Management Plan
CSS	Coastal Sage Scrub
CVREP	Carmel Valley Restoration Enhancement Project
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DAR	Direct Access Ramp
dBA	A-weighted decibel
dBA L_{eq}	A- weighted decibel equivalent sound level
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
EB	Eastbound
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMP	Environmental Mitigation Program
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act, Environmentally Sensitive Area
ESHA	Environmentally sensitive habitat area

Appendix A
List of Acronyms, cont.

FEMA	Federal Emergency Management Agency
FGC	California Fish and Game Code
FHWA	Federal Highway Administration
ft	Foot or feet
ft^2	Square foot or feet; foot or feet squared
GHG	Greenhouse gas
GIS	Geographic Information System
HCP	Habitat Conservation Plan
HOT	High occupancy toll
HOV	High Occupancy Vehicle
I-5	Interstate 5
I-5 NCC	Interstate 5 North Coast Corridor
I-15	Interstate 15
I-805	Interstate 805
IAP	Intermediate access points
ISA	Initial Site Assessment
ISC	Indirect Source Control
ISTEA	Intermodal Surface Transportation Efficiency Act
ITS	Intelligent Transportation System
JPA	Joint Powers Authority for San Dieguito River Valley Regional Open Space Park
LCP	Local Coastal Plan
LEDPA	Least Environmentally Damaging Practicable Alternative
Leq	Equivalent Sound Level
LOS	Level of Service
LOSSAN	Los Angeles – San Diego – San Luis Obispo Rail Corridor
LPA	Locally Preferred Alternative
M	million (in dollars)
Max.	maximum
MHCP	Multiple Habitat Conservation Program
MHHW	Mean Higher High Water
mi	Mile(s)
min	Minute(s)

Appendix A
List of Acronyms, cont.

MLLW	Mean Lower Low Water
MOU	Memorandum of Understanding
MSCP	Multiple Species Conservation Program
MSL	Mean Sea Level
MTS	Metropolitan Transit System
MWE	Maximum water elevation
N/A	Not applicable
NAHC	Native American Heritage Commission
NB	Northbound
NCTS	North Coast Transportation Study
NCTD	North County Transit District
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOD	Notice of Determination
NOI	Notice of Intent
NOP	Notice of Preparation
PLAGUE	Prevent Los Angeles Gridlock Usurping the Environment
p.m.	Evening/nighttime
PM	Post Mile
PSR	Project Study Report
PWP	Public Works Plan
REP	Resour**c**e Enhancement Program
RTP	Regional Transportation Plan
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SA	Study Area
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCAG	Southern California Association of Governments
SCC	California State Coastal Conservancy
SCE	Southern California Edison
SDRVLC	San Dieguito River Valley Land Conservancy
SED	Supplemental Environmental Document
SELRP	San Elijo Lagoon Restoration Project

Appendix A
List of Acronyms, cont.

sf	Square foot/feet
SHPO	State Historic Preservation Officer
SLR	Sea level rise
SONGS	San Onofre Nuclear Generating System
SOV	Single Occupancy Vehicle
SR-56	State Route 56
SR-76	State Route 76
SR-78	State Route 78
TREP	Transportation and Resource Enhancement Program
UCSD	University of California, San Diego
U.S.	United States
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USDOT	U.S. Department of Transportation
UTC	University Town Center
WB	Westbound

Appendix B:
Park and Ride Community Enhancements

Appendix B:
Park and Ride Community Enhancements

This appendix contains depictions of three community enhancement park and ride facilities, located at the following locations:

- Carmel Valley Road
- La Costa Avenue
- State Route 76

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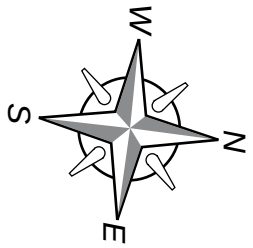
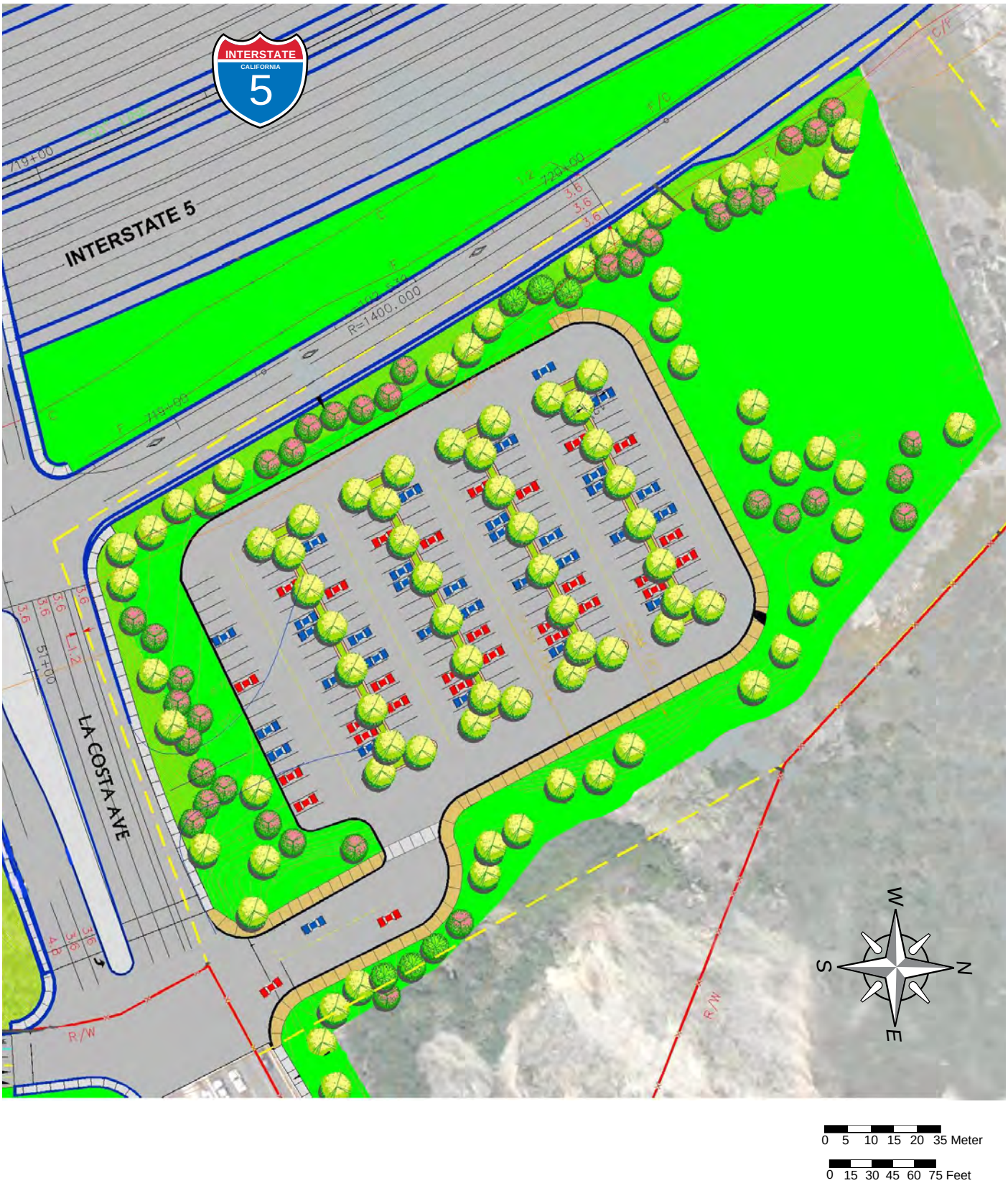


0 10 20 30 40 50M

0 30 60 90 120 150'

Appendix B-1: Parking Area at Carmel Valley Road



Appendix B-2: Parking Area at La Costa Avenue

0 5 10 15 20 25
Meters

0 15 30 45 60 75
Feet

N
W
E
S

Appendix B-3: Parking Area at State Route 76

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Appendix C:
Sensitive Species Survey, Dates and Personnel

Appendix C
Sensitive Species Surveys, Dates and Personnel

Date	Survey Personnel	Survey Activity
2/7/2003	Sue Scatolini Nicole Shorey	General
2/10/2003	Sue Scatolini Matt Guilliams Nicole Shorey	General
2/10/2003	Sue Scatolini Matt Guilliams Nicole Shorey	California Gnatcatcher
2/24/2003	Sue Scatolini Matt Guilliams	General
2/24/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher
2/26/2003	Sue Scatolini Matt Guilliams	General
3/3/2003	Sue Scatolini Matt Guilliams	General
3/3/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher
3/5/2003	Sue Scatolini Matt Guilliams	General
3/5/2003	John Konecny	Clapper Rail
3/6/2003	John Konecny	Clapper Rail
3/7/2003	Sue Scatolini Matt Guilliams	General
3/7/2003	John Konecny	Clapper Rail

Date	Survey Personnel	Survey Activity
3/24/2003	John Konecny	Clapper Rail
3/26/2003	John Konecny	Clapper Rail
3/26/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher
3/27/2003	John Konecny	Clapper Rail
4/8/2003	John Konecny	Clapper Rail
4/9/2003	John Konecny	Clapper Rail
4/10/2003	John Konecny	Clapper Rail
4/11/2203	John Konecny	Clapper Rail
4/12/2003	John Konecny	Clapper Rail
4/17/2003	Sue Scatolini Kim Miller	Least Bell's Vireo
4/21/2003	Sue Scatolini Matt Guilliams	General
4/23/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher
4/26/2003	John Konecny	Clapper Rail
4/28/2003	John Konecny	Clapper Rail
4/28/2003	Sue Scatolini Matt Guilliams	General
4/30/2003	Sue Scatolini Matt Guilliams Kim Miller	Least Bell's Vireo
5/2/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher

Appendix C
Sensitive Species Surveys, Dates and Personnel, cont.

Date	Survey Personnel	Survey Activity
3/8/2003	John Konecny	Clapper Rail
3/12/2003	Sue Scatolini Matt Guilliams	General
3/12/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher
3/12/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher
3/14/2003	John Konecny	Clapper Rail
3/19/2003	John Konecny	Clapper Rail
3/20/2003	John Konecny	Clapper Rail
3/24/2003	Sue Scatolini Matt Guilliams	General
5/12/2003	Bob James Russ Williams Scott Quinnell	California Gnatcatcher
5/12/2003	Sue Scatolini Karen Drewe Kedest Ketsela	California Gnatcatcher
5/20/2003	John Konecny	Clapper Rail
5/21/2003	John Konecny	Clapper Rail
5/22/2003	John Konecny	Clapper Rail
6/9/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher

Date	Survey Personnel	Survey Activity
5/2/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher
5/5/2003	Sue Scatolini Matt Guilliams	California Gnatcatcher
5/5/2003	Bob James Russ Williams Scott Quinnell	California Gnatcatcher
5/5/2003	John Konecny	Clapper Rail
5/6/2003	John Konecny	Clapper Rail
5/8/2003	John Konecny	Clapper Rail
5/9/2003	John Konecny	Clapper Rail
5/10/2003	John Konecny	Clapper Rail
8/4/2003	Sue Scatolini Bob James Barbara Marquez Melissa Olson Russ Williams	California Gnatcatcher
8/11/2003	Sue Scatolini Bob James Barbara Marquez Melissa Olson Scott Quinnell	California Gnatcatcher
8/14/2003	Sue Scatolini Debbie Waldecker	California Gnatcatcher

Appendix C
Sensitive Species Surveys, Dates and Personnel, cont.

Date	Survey Personnel	Survey Activity
6/9/2003	Sue Scatolini Matt Guilliams	Least Bell's Vireo
6/23/2003	Sue Scatolini Debbie Waldecker	Least Bell's Vireo
6/27/2003	Sue Scatolini Matt Guilliams Nicole Shorey	California Gnatcatcher
7/3/2003	Sue Scatolini Kim Miller	Least Bell's Vireo
7/8/2003	Sue Scatolini Nicole Shorey	California Gnatcatcher
7/14/2003	Sue Scatolini Debbie Waldecker	Least Bell's Vireo
7/24/2003	Sue Scatolini Nicole Shorey	Least Bell's Vireo
7/25/2003	Bob James Russ Williams Karen Drewe	California Gnatcatcher
7/28/2003	Sue Scatolini Debbie Waldecker	California Gnatcatcher

Date	Survey Personnel	Survey Activity
8/26/2003	Bob James Barbara Marquez Melissa Olson Russ Williams	California Gnatcatcher
1/20/2004	Sue Scatolini Kim Miller	Belding's Savannah Sparrow
3/8/2004	Sue Scatolini Rich Burg	California Gnatcatcher
4/22/2004	Sue Scatolini Kim Miller	Wetland Delineation
4/22/2004	Sue Scatolini Kim Miller	Least Bell's Vireo
4/24/2004	John Konecny	Clapper Rail
5/2/2004	John Konecny	Clapper Rail
5/4/2004	Sue Scatolini Debbie Waldecker	General
5/4/2004	Sue Scatolini Debbie Waldecker	Least Bell's Vireo
5/9/2004	John Konecny	Clapper Rail
5/17/2004	Sue Scatolini Kim Miller	Least Bell's Vireo
	John Konecny	Clapper Rail

Appendix C
Sensitive Species Surveys, Dates and Personnel, cont.

Date	Survey Personnel	Survey Activity
7/28/2003	Sue Scatolini Debbie Waldecker	California Gnatcatcher
7/31/2003	Nicole Shorey Matt Guilliams	Least Bell's Vireo
6/10/2004	Sue Scatolini Rich Burg	Least Bell's Vireo
6/22/2004	Sue Scatolini Rich Burg	Least Bell's Vireo
6/24/2004	Sue Scatolini Kim Miller	SWWFL SLR
6/30/2004	Sue Scatolini Kim Miller	SWWFL SLR
7/8/2004	Sue Scatolini Kim Miller	SWWFL SLR
7/13/2004	Sue Scatolini Rich Burg	Least Bell's Vireo
7/22/2004	Sue Scatolini Kim Miller	Least Bell's Vireo
3/2/2005	Sue Scatolini Kim Miller	California Gnatcatcher
3/15/2005	Sue Scatolini Rich Burg Arianne Glagola Melissa Williams Scott Quinnell	California Gnatcatcher
4/5/2005	Sue Scatolini Kim Miller	Belding's Sav. Sparrow
4/15/2005	Sue Scatolini Kim Miller	Belding's Sav. Sparrow
6/9/2005	Sue Scatolini Arianne Glagola Melissa Williams Scott Quinnell	California Gnatcatcher
6/9/2005	Bob James Kedest Ketsela Barbara Marquez	California Gnatcatcher

Date	Survey Personnel	Survey Activity
6/1/2004	Sue Scatolini Debbie Waldecker	Least Bell's Vireo
6/6/2004	John Konecny	Clapper Rail
6/8/2004	Sue Scatolini Kim Miller	Wetland Delineation
4/26/2005	Sue Scatolini Bob James Kedest Ketsela Melissa Williams Scott Quinnell	California Gnatcatcher
5/13/2005	Sue Scatolini Kim Miller	Belding's Sav. Sparrow
6/8/2005	Sue Scatolini Kim Miller	Belding's Sav. Sparrow
6/25/2005	Bob James Arianne Glagola Melissa Williams	California Gnatcatcher
6/27/2005	Sue Scatolini Kim Miller	Rare Plant Mapping
7/22/2005	Sue Scatolini Arianne Glagola Bob James Scott Quinnell	California Gnatcatcher
10/18/2005	Sue Scatolini Debbie Waldecker	Vegetation Mapping
7/17/2006	Sue Scatolini Arianne Glagola	California Gnatcatcher
6/13/2007	Sue Scatolini Rush Abrams	California Gnatcatcher
3/9/2012	Sue Scatolini Tim Dillingham	California Gnatcatcher
5/16/12	Sue Scatolini Rush Abrams	California Gnatcatcher
5/31/12	Sue Scatolini Sandra Lavender	California Gnatcatcher
6/11/12	Sue Scatolini Rush Abrams	California Gnatcatcher