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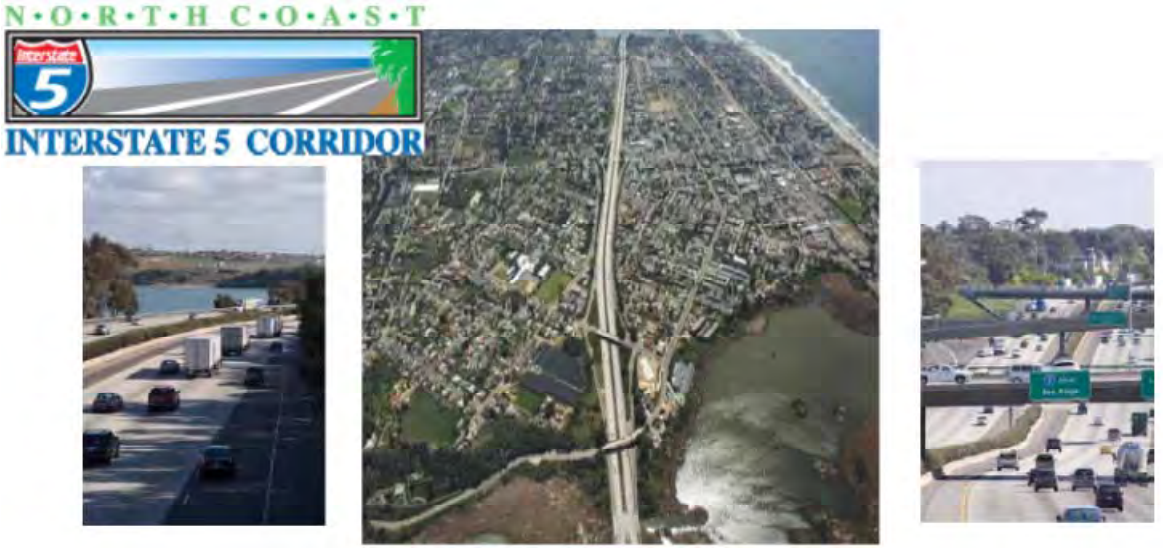
Interstate 5 North Coast Corridor Project

SAN DIEGO COUNTY, CALIFORNIA
DISTRICT 11–SD –5 (PM R28.4/R55.4)
EA 235800 (P ID 1100000159)

Final
Environmental Impact Report/
Environmental Impact Statement
and Section 4(f) Evaluation



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

Caltrans Metric

October 2013

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It should be noted that this Final EIR/EIS is not project approval for CEQA purposes. The signing of the Project Report and filing of the Notice of Determination constitute the approval for CEQA purposes.

At a future date the Federal Highway Administration may publish a notice in the Federal Register, pursuant to 23 USC Section 139(l), indicating that a final action has been taken on this project. If such notice is published, a lawsuit or other legal claim will be barred unless it is filed within 150 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.

SCH# 2004101076
11-SD-5-PM R28.4/R55.4
EA 11-235800 (P ID 1100000159)

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

FINAL ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT and Section 4(f) Evaluation

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

THE STATE OF CALIFORNIA
Department of Transportation

and

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

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 Wildlife
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
City of Oceanside

10/23/13
Date of Approval

Laurie Berman
District Director
California Department of Transportation

10/23/13
Date of Approval

Vincent Mammano
Division Administrator
Federal Highway Administration

The following persons may be contacted for additional information concerning this document:

Shay Lynn M. Harrison, Environmental Analysis Branch Chief
California Department of Transportation – District 11
Division of Environmental Analysis, MS 242
4050 Taylor Street
San Diego, CA 92110
(619) 688-0190

Manuel E. Sánchez
Senior Transportation Engineer
Federal Highway Administration
401 B Street, Suite 800
San Diego, CA 92101
(619) 699-7336

Abstract: This document is a Final 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 refined 8+4 Buffer Alternative as the Preferred Alternative. The Preferred Alternative 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 designs 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. Review under the California Environmental Quality Act has been completed for this project.

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Appendices

EXECUTIVE SUMMARY

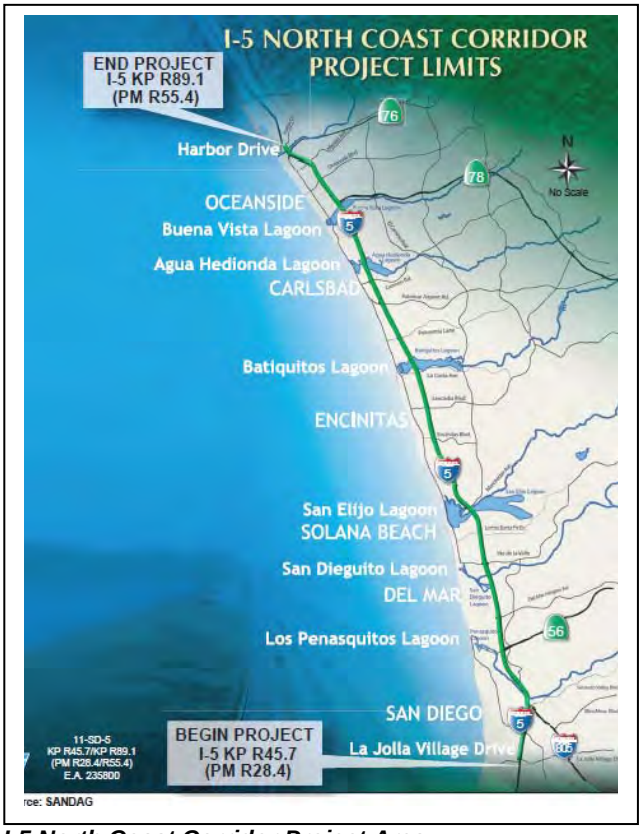
This section summarizes the Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed *I-5 North Coast Corridor (NCC) Project*. It is also intended to provide an overview of the processes that have continued since release of the Draft EIR/EIS and Supplemental Draft EIR/EIS and consideration of all comments received during public review. This *Executive Summary* provides a condensed version of the technical information discussed in the EIR/EIS and includes references to specific sections of the Final EIR/EIS for additional detailed analysis and discussion.[1]

ES.1 OVERVIEW OF THE PROJECT

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) propose improvements to maintain or improve the existing and future traffic operations on the Interstate (I-) 5 freeway from La Jolla Village Drive in San Diego to Harbor Drive in Oceanside/Camp Pendleton, extending approximately 27 miles from post mile (PM) R28.4 to PM R55.4 on I-5.

The *I-5 NCC Project* sponsors include FHWA, Caltrans, and the San Diego Association of Governments (SANDAG). FHWA is the Lead Agency under the National Environmental Policy Act (NEPA) and Caltrans is the Lead Agency under the California Environmental Quality Act (CEQA). This environmental document was prepared in compliance with the requirements of CEQA and NEPA and in a manner consistent with the NEPA Clean Water Act (CWA) Section 404 Memorandum of Understanding (MOU). Under the MOU process, signatory agencies, which include FHWA, the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS), U.S. Army Corps of Engineers (USACE), and U.S. Environmental Protection Agency (USEPA), were asked to concur on the following two milestones prior to public circulation of the Draft EIR/EIS in 2010: (1) the purpose and need statement; and (2) identification of the range of alternatives and consideration of the criteria used to select and analyze the range of alternatives to be studied in the EIR/EIS. Concurrence on the Preliminary Least Environmentally Damaging Practicable Alternative (LEDPA) Determination and Conceptual Mitigation Plan, leading to identification of the Preferred Alternative, was completed in 2013.

Additionally, the California Coastal Commission (CCC), California Department of Fish & Wildlife (CDFW), and the Regional Water Quality Control Board (RWQCB) have participated in the NEPA 404 MOU coordination process.



I-5 North Coast Corridor Project Area

The proposed project improvements include one or two High Occupancy Vehicle (HOV)/Managed Lanes in each direction, auxiliary lanes where needed, and possibly one general purpose lane in each direction. The HOV/Managed Lanes would be available for carpools, vanpools, and buses at

[1] This Executive Summary was written for this Final EIR/EIS.

no cost, and would be available to Single Occupancy Vehicles (SOVs) for a fee when there is sufficient capacity.

The project area of the North Coast Corridor begins in the northern portion of the City of San Diego and extends to the northern part of San Diego County. This part of I-5 was constructed through the Cities of San Diego, Solana Beach, Encinitas, Carlsbad, and Oceanside in the mid 1960s and early 1970s. I-5 is a principal north-south transportation facility that is a part of the National Highway System, extending from the Mexican border to the Canadian border. The only other roadway which extends the length of the corridor is the Pacific Coast Highway[2] to the west.

Land uses within the North Coast Corridor are varied, with the majority of land directly adjacent to the I-5 right-of-way developed for residential, industrial, and/or commercial uses. Numerous existing natural and visual resources within the project area have been preserved from development. Los Peñasquitos Creek, Carmel 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 six lagoons—Los Peñasquitos, San Dieguito, San Elijo, Batiquitos, Agua Hedionda, and Buena Vista. These waterways offer habitat and wildlife that are both State and federally protected.

A Corridor System Management Plan (CSMP) prepared for the North Coast Corridor provides for a unified concept to manage, operate, improve, and preserve the corridor across all modes and jurisdictions. Its goals include sustainability, livability, mobility, efficiency, equity, accessibility, and reliability. This concept integrates and coordinates all travel modes in the corridor—including highways, parallel and connecting roadways, public transit, and bikeways—for multimodal analysis. The CSMP focuses on how transit, local roadways, highways, pedestrian routes, and land use work together as an integrated system.

The analyses presented in the Draft EIR/EIS and Supplemental Draft EIR/EIS were reviewed and updated as necessary to ensure that the information in this Final EIR/EIS remains current. The extensive environmental review undertaken for the *I-5 NCC Project*, combined with public input and resource agency coordination, has resulted in identification of a Preferred Alternative that has the fewest adverse environmental impacts while still addressing the project purpose and need, as discussed in *Section ES.2*.

The proposed I-5 improvements are only one part of a larger multimodal solution to North Coast Corridor transportation that addresses highway, rail and bus transportation, as well as pedestrian and bicycle facilities.

ES.2 PURPOSE AND NEED

ES.2.1 PROJECT PURPOSE

The *I-5 NCC Project's* main purpose is to maintain or improve the existing and 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 design year of 2035.

The objectives of the project are to:

- Maintain or improve future traffic levels of service in 2035 over the existing levels of service
- 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 project-level consistency with adopted Regional Transportation Plans (RTPs), as appropriate, where feasible and in compliance with federal and State regulations
- Maintain the facility as an effective link in the national Strategic Highway Network

[2] This roadway's name changes depending on jurisdiction.

- Protect and/or enhance the human and natural environment along the I-5 corridor

ES.2.2 PROJECT NEED

The I-5 North Coast Corridor is subject to periods of congestion that are projected to worsen over the next 40 years. Since the original construction of this segment of I-5 in the 1960s and early 1970s, 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. Specifically, as noted in the SANDAG 2050 RTP, regional population is projected to be 36 percent higher than 2010 levels by the year 2050.

Traffic forecasting for 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.

The existing average southbound duration to travel through the project area during peak travel time is between 31 and 44 minutes (min) a.m./27 and 32 min p.m., and northbound peak time duration is between 24 and 25 min a.m./33 and 39 min p.m. If no improvements are made, the projected year 2035[3] average southbound peak time duration would be 53 to 54 min a.m./40 to 48 min p.m., and northbound peak time duration would be 29 to 37 min a.m./67 to 69 min p.m.

Along with increased duration of travel through the project area, forecasts also indicate that the increase in Average Daily Traffic (ADT) would lengthen the duration of congestion (the period during which lengthened travel times would occur in the corridor) in both the northbound and southbound directions if no improvements are made. Forecasted duration of congestion in the northbound direction would be three and one-half hours in year 2035 peak a.m. compared to none currently, and six hours in year 2035 peak p.m. compared to five hours currently. Forecasted duration of congestion in the southbound direction also would increase by an hour in both a.m. and p.m. peak conditions, from five hours currently to six hours in year 2035.

While deficiencies associated with congestion may be most visible on I-5, the effects are not limited solely to the highway. Highway congestion often causes regional and interregional trips to "spill over" onto local streets, as frustrated travelers exit the highway in search of less-congested routes. This results in through traffic using coastal access routes and local streets in attempts to bypass congestion, which can negatively affect the character of these coastal communities, as well as access to coastal resources.

Connections to local bike trails and regional bicycle corridors also 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.

ES.2.3 INDEPENDENT UTILITY AND LOGICAL TERMINI

Project implementation would result in maintaining or improving current traffic conditions within the corridor. The results of project implementation are not dependent on other projects being developed. There is independent utility, because no additional or adjoining transportation improvements are required to maintain or improve the current traffic conditions.

The project addresses north-south traffic on that portion of I-5 that is north of other improvements that have already been completed or that are proposed in the City of San Diego. It extends to the northern extent of the City of Oceanside,

[3] The Project Team determined that the initial Series 2030 forecasted traffic volumes, which provided the basis of the original traffic studies, were indicative of year 2035 volumes (within 3.5 percent) and that revision would not alter the results of the associated studies.

where traffic congestion eases due to military lands/open space being the dominant land use. These boundaries, or termini, are logical because the southern terminus connects to areas that are already improved, and because traffic studies show congestion beginning north of the existing improvements. The northern terminus point is logical because it is located where the need for improvement ends. The inclusion of the entire 27-mile stretch between the southern and northern end points, combined with expansion of potentially affected habitat review to encompass lagoon systems crossed by I-5, incorporates the area potentially affected by project construction and operation, and allows for discussion of environmental matters on a broad scope.

The proposed improvements to this 27-mile stretch of I-5, including the HOV/Managed Lanes and bridge widenings, as well as pedestrian and bicycle upgrades, create a project that has independent use by local and "through" traffic users. It also represents a reasonable expenditure of public funds to benefit the local area and region. Because of I-5's importance to Statewide transportation and as a part of the Strategic Highway Network, the improvements provide Statewide and even national benefits.

Implementation of the project would not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. The project has been designed to integrate into, and improve access to, other non-automotive transportation options within the North Coast Corridor. These options include BRT, pedestrian and bicycle, transit and rail.

ES.3 PROPOSED PROJECT

ES.3.1 ALTERNATIVES

Four build and one No Build alternatives (described below) were evaluated as possible actions. Elements of these alternatives include:

- Up to 10 general purpose 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) both north- and southbound
- Auxiliary lanes (to facilitate weaving) as necessary
- Use of permanent barriers or striped buffers between the general purpose and HOV/Managed Lanes

The project is designed in metric units. The Final EIR/EIS provides a hard conversion to English units within the text. During final design, each segment would be converted to English units using the most recent design standards. Any impacts associated with this conversion would be assessed and proper environmental documentation would occur before listing any segment for construction.

Preferred Alternative

8+4 Buffer Alternative

The 8+4 Buffer alternative would separate HOV/Managed Lanes from general purpose lanes with a striped buffer that is up to five ft in width from near La Jolla Village Drive in the City of San Diego to near Harbor Drive/Vandegrift Boulevard in the City of Oceanside. There would be two HOV/Managed Lanes from Voigt Drive in San Diego to the HOV/Managed Lanes freeway-to-freeway connector. Four HOV/Managed Lanes would be built from north of the HOV/Managed Lanes freeway-to-freeway connector in San Diego to Harbor Drive/Vandegrift in Oceanside. New freeway access opportunities for transit would be provided via Direct Access Ramps (DARs) at Voigt Drive and Manchester Avenue. There would be auxiliary lanes constructed at various locations within the project area as well as other operational improvements (see discussion of Common Design Elements of the Build Alternatives, below).

Following circulation and receipt of comments on the Draft EIR/EIS in 2010, project planning and design refinement of the 8+4 Buffer alternative continued. The refined 8+4 Buffer alternative was determined to be the locally preferred alternative

(LPA) in 2011. Detailed impact information related to lagoon crossings, potential sea level rise issues, and potential community and regional enhancements was presented in the Supplemental Draft EIR/EIS which was circulated in August 2012. Following publication of that document and receipt of public comments on the Supplemental Draft EIR/EIS, refinements continued through early 2013.

The refined 8+4 Buffer alternative is the smallest of the build alternatives presented in this Final EIR/EIS. It would require the least amount of new right-of-way, and would result in the least or lowest impacts of all the build alternatives relating to:

- Park and recreational facilities, including Section 4(f) resources
- Farmland, including coastal agriculture
- 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
- Residential and business displacement
- Increase in impervious area

The 8+4 Buffer alternative also would allow the largest available space for treatment of stormwater.

All of the refinement efforts were completed with extensive coordination with the resource agencies regarding the minimization of potential project impacts and appropriate project mitigation. Completion of CWA Section 404(b)(1) analysis in June 2013 confirmed that the refined 8+4 Buffer alternative is the LEDPA, as described below, and is identified as the *I-5 NCC Project* Preferred Alternative analyzed throughout this Final EIR/EIS.

The 8+4 Buffer alternative is estimated to cost $3.062 billion.

LEDPA Identification

CWA Section 404 guidelines control discharge of dredged or fill material to waters of the U.S., including wetlands or other special aquatic sites, which are areas possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. Discharge is allowed only if the discharge is determined to be the LEDPA (40 Code of Federal Regulations (CFR) §230.10[a]). The LEDPA generally is the practicable alternative that either avoids waters of the U.S. or impacts the smallest area of waters.

Per 40 CFR §230.10(b), no discharge of dredged or fill material shall be permitted if it: (1) causes or contributes to violations of any applicable State water quality standard; (2) violates an applicable toxic effluent standard; (3) jeopardizes the continued existence of species listed as endangered or threatened under the federal Endangered Species Act of 1973 (FESA), as amended, or results in the likelihood of the destruction or adverse modification of a habitat which is determined to be a critical habitat under the FESA; or (4) violates any requirement imposed to protect any marine sanctuary as identified in the code section.

The evaluation of alternatives must consider a reasonable range of options that could fulfill the project purpose and need. An alternative with fewer impacts to aquatic resources than the "preferred alternative" may be eliminated by demonstrating that it has other overriding severe environmental impacts or does not meet the project's purpose and need.

Identification of the LEDPA is one of the important checkpoints required from federal agencies coordinating on I-5 under the 404 MOU integration process described in *Section ES.1*.

After circulation of the Draft EIR/EIS and Supplemental Draft EIR/EIS, coordination with the resource agencies regarding impacts and appropriate minimization and mitigation continued, as noted above.

Four feasible build alternatives are evaluated in the EIR/EIS. Since full avoidance alternatives are not practicable, and because each of the *I-5 NCC Project* build alternatives would result in some aquatic resource loss, the practicable alternative with the least damage to aquatic resources must be identified as the LEDPA, unless it has other significant adverse environmental consequences. Because the location of I-5 is fixed and the use of the areas already developed for the existing freeway would minimize impacts to natural habitats, including wetlands and other waters of the U.S., build alternatives are the only practicable alternatives. In other words, other locations or corridors would not be practicable to construct and would result in more impacts to the aquatic ecosystem as a result of building new bridges and roadway at a different location. Similarly, complete avoidance of wetlands and other waters of the U.S. in the existing North Coast Corridor would not be practicable to construct and would be far more costly. As noted, the No Build alternative would not be practicable in light of the overall project purpose. Based on preliminary analysis and as discussed in detail in *Chapter 3*, the least environmentally damaging of these build alternatives would be the refined 8+4 Buffer alternative. The 8+4 Buffer alternative would have the least acreage of impacts on natural resources overall and the least acreage of impacts/Section 404 discharges to wetlands, other special aquatic sites, and overall waters of the U.S.

It is also expected that this alternative would meet the other requirements/restrictions specified in the Section 404(b)(1) Guidelines. Specifically, the issued Biological Opinion supports that the 8+4 Buffer alternative would not jeopardize the continued existence of any federally listed as endangered or threatened species or adversely modify designated critical habitat of any federally listed species. It is not expected that any marine sanctuaries would be affected by this alternative (or any build alternative). Issuance of a Section 401 Water Quality Certification by the San Diego RWQCB, which is required before a USACE permit can be issued, would confirm that it would not violate any applicable State water quality standard and would not violate any applicable toxic effluent standard or prohibition under Section 307 of the CWA, as a result of project-required Best Management Practices (BMPs).

The least environmentally damaging of the analyzed alternatives, therefore, would be the 8+4 Buffer alternative, especially with the design refinements described in this Final EIR/EIS. The refined 8+4 Buffer alternative also would have the fewest net permanent impacts (in terms of number and acreage) on resources overall, including the fewest impacted ac of waters of the U.S. (11.61 ac for the Preferred Alternative v. up to 17.17 ac for the 10+4 Barrier alternative) and State wetlands (15.92 ac for the Preferred Alternative v. up to 23.03 ac for the 10+4 Barrier alternative).

In letters to the USFWS, USACE, NMFS, and USEPA dated April 29, 2013, Caltrans asked for concurrence on the selection of the refined 8+4 Buffer alternative as the preliminary Preferred Alternative and LEDPA. All four of the agencies concurred with Caltrans' selection: NMFS in a letter dated May 28, 2013; USEPA in a letter dated June 10, 2013; USFWS in a letter dated June 18, 2013; and USACE in a letter dated July 15, 2013.

Other Build Alternatives

10+4 Barrier Alternative

The 10+4 Barrier alternative would separate HOV/Managed Lanes from the general purpose lanes with a concrete barrier using standard shoulder widths. A 10-ft shoulder would be provided on either side of the barrier from north of Del Mar Heights Road to south of State Route (SR-) 78. A buffer varying in width of up to five ft would separate the HOV/Managed Lanes from the general purpose lanes from near La Jolla Village Drive to Del Mar Heights Road and from SR-78 to near Harbor Drive/Vandegrift Boulevard.

There would be two HOV/Managed Lanes from Voigt Drive to the HOV/Managed Lanes freeway-to-freeway connector in the City of San Diego. There would also be a total of four HOV/Managed Lanes built from north of the HOV/Managed Lanes freeway-to-freeway connector to Harbor Drive/Vandegrift in Oceanside. New freeway

access opportunities for transit would be provided via DARs at Voigt Drive and at Manchester Avenue. One general purpose lane would be constructed in each direction on I-5 from south of Del Mar Heights Road in San Diego to SR-78 in Oceanside. There would be auxiliary lanes constructed at various locations within the project area as well as other operational improvements.

This alternative would cost $4.495 billion.

10+4 Buffer Alternative

The 10+4 Buffer alternative would function similarly to the 10+4 Barrier alternative but would use a striped buffer varying in width of up to five ft to separate the HOV/Managed Lanes from the general purpose lanes instead of a concrete barrier.

The 10+4 Buffer alternative is estimated to cost $3.601 billion.

8+4 Barrier Alternative

The 8+4 Barrier alternative would function similarly to the 8+4 Buffer alternative but would separate the HOV/Managed Lanes from the general purpose lanes with a barrier using standard shoulder widths. A 10-ft shoulder would be provided on either side of the barrier from Del Mar Heights Road to SR-78. Similar to the 10+4 Barrier, a buffer varying in width of up to five ft would separate the HOV/Managed Lanes from the general purpose lanes from a location near La Jolla Village Drive to Del Mar Heights Road and also from SR-78 to near Harbor Drive/Vandegrift Boulevard.

The 8+4 Barrier alternative is estimated to cost $4.121 billion.

No Build Alternative

The No Build alternative would maintain the current configuration of the existing I-5 facility and offers a basis for comparison of existing and the 2035 no build conditions with the 2035 build alternatives. This alternative would include ongoing operations and facility maintenance. In addition, a number of interchange/operations and adjacent transportation projects are assumed to be implemented under the No Build alternative as detailed in *Section 2.2.4* of this Final EIR/EIS. These projects would move forward independently from the *I-5 NCC Project* and would be analyzed within separate environmental documents.

Common Design Elements of the Build Alternatives

Each build alternative shares common features related to project design, and community and regional enhancements. In fact, all alternatives are the same from south of La Jolla Village Drive to Del Mar Heights Road and from SR-78 to near Harbor Drive.

A listing of the common design elements is provided in *Table ES.1, Common Design Elements of the Build Alternatives.* Common design elements with substantial effects on I-5 highway design include two DARs, braided lanes, and auxiliary lanes. Impacts/benefits and minimization and/or mitigation are provided in tables at the end of this *Executive Summary* in *Table ES.2, Direct Access Ramps Information, Table ES.3, Braided Ramps Information*, and *Table* ES*.4, Auxiliary Lanes Information;* with locations of these facilities depicted on *Figures ES-1, Sheets 1 through 67 – Project Features Maps: 8+4 Buffer (Preferred Alternative).*[4]

As a result of the bridge optimization review completed after circulation of the Draft EIR/EIS through August 2012 and as presented in the Supplemental Draft EIR/EIS, new I-5 bridge designs were identified. The lagoon bridge optimization summary analyses are detailed at the end of this *Executive Summary* for each lagoon crossed by I-5 in *Tables ES.5* through *ES.10*. Replacement bridges are 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 refined 8+4 Buffer alternative (Preferred Alternative). A comparison of existing and proposed bridge lengths for lagoon and related waterway crossings, regardless of alternative, is shown on *Table ES.11, Proposed Bridge Lengths.*

[4] Page numbering on *Figures ES-1* reflects that these figures are duplicated from *Chapter 2* of this Final EIR/EIS.

Table ES.11: Proposed Bridge Lengths (in feet)

Bridge Structures	Existing Length	Proposed Length
Los Peñasquitos Lagoon	--	--
Soledad Canyon Creek[1]	N/A	863
Los Peñasquitos Creek[1]	NA[4]	3376
Carmel Creek[2]	421	421
Sorrento Valley Road[3]	NA[4]	443
San Dieguito Lagoon	650	650
San Elijo Lagoon	340	560
Batiquitos Lagoon	219	282
Agua Hedionda Lagoon	191	191
Buena Vista Lagoon	102.4	197

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

If you are interested in reading more about proposed changes to the I-5 bridge crossings of North Coast Corridor lagoons and their benefits, please see Sections 3.9 and 3.17 of this Final EIR/EIS.

HOV and Value Pricing are proposed for the *I-5 NCC Project,* with Managed Lane strategies. Managed Lanes actively manage and control traffic though a combination of access control, vehicle eligibility, and pricing strategies to make the most effective and efficient use of a freeway facility. HOV lanes provide additional highway capacity through the number of occupants in a constrained corridor while minimizing impacts to the environment and surrounding communities. Value Pricing is an option under Managed Lanes that provides additional highway capacity by allowing SOVs to pay to use the Managed Lanes when extra capacity exists.

Common Enhancements of the Build Alternatives

The *I-5 NCC Project* Development Team (PDT) is a team composed of FHWA, Caltrans, SANDAG, and local cities. The PDT incorporated input from various communities throughout the project corridor, to develop a number of potential regional and community enhancement opportunities that would provide additional benefits to local communities and would be constructed simultaneously with the *I-5 NCC Project*. Caltrans staff conducted numerous meetings with the general public, city staff, elected officials, and other stakeholder groups, such as the lagoon foundations and community planning groups, to develop and refine enhancement concepts based on regional/community needs and site conditions.

The "candidate" projects would have little to no additional impacts over those previously identified for the *I-5 NCC Project* and include trails, park and ride enhancements, streetscape enhancements, etc. Community enhancement opportunities as project features of the *I-5 NCC Project* are proposed that fit the following conditions: they have regional significance, they are within or adjacent to the footprint of the *I-5 NCC Project* described in this document; they preserve and enhance community character and avoid environmental impacts, and future formal cooperative agreements would occur between Caltrans and each city, where Caltrans would build these features and Caltrans/the cities would agree on responsibility for their maintenance. Detailed information on the regional and community enhancements is provided in *Tables ES.12, North Coast Bike Trail Information*, and *ES.13, Community Enhancements Information,* at the end of this Summary.

The I-5 North Coast (NC) Bike Trail, a regional enhancement, is a new bike trail concept developed to support non-motorized travel in the corridor. The NC Bike Trail would extend approximately 27 miles between Gilman Drive in the City of San Diego and Harbor Drive in the City of Oceanside. Portions of the NC Bike Trail would be located within Caltrans, rail, and local

jurisdictions rights-of-way; with Caltrans and SANDAG working with the appropriate jurisdictions to ensure consistency with local bike plans. 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 they would connect with existing non-motorized trails.

Common Benefits of the Build Alternatives

The proposed HOV/Managed Lanes would be managed to allow free-flow conditions, providing a more reliable travel time of approximately 25 min (at 65 miles per hour [mph]) within the 27-mile project area. This project also supports future BRT in the North Coast Corridor by allowing direct access through the proposed DARs at Voigt Drive and Manchester Avenue to the HOV/Managed Lanes, thereby eliminating the need for buses to access the HOV/Managed Lanes by crossing all of the general purpose lanes. Accordingly, travel time reliability would be more assured for all HOV/Managed Lane users; including car poolers, BRT riders and, when capacity allows, paying single drivers.

The proposed HOV/Managed Lanes would be managed to allow free-flow conditions, with 25 min travel time at 65 mph within the 27-mi long North Coast Corridor.

Reductions in congestion on I-5 would be expected to have beneficial impacts on surrounding surface streets, as well. As noted above, highway congestion often causes regional and interregional trips to "spill over" onto local streets, resulting in vehicular use of coastal access routes and local streets in attempts to bypass highway congestion.

NC Bike Trail sections would fill in gaps between existing trails in the cities along I-5, and connect to other regional and inter-regional bicycle facilities.

ES.3.2 SCHEDULE

Critical to project scheduling is the overall implementation framework that coordinates the timing of rail, highway, and resource-enhancement project components. Consistent with California Senate Bill (CA SB) 468, I-5 improvements would not outpace other multimodal transportation improvements planned for the I-5 North Coast Corridor, nor would it outpace natural resources restoration and enhancement. Wetland and other biological impacts would not occur in advance of project mitigation – mitigation would occur prior to or concurrent with those impacts.

For information on phasing of project elements with regard to lagoon crossings and mitigation implementation prior to impact actions, please see Section 3.17 of this EIR/EIS.

Highway construction is planned to begin as early as 2015, with phased completion of all project elements by 2035. Over this two-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 in each direction. This first phase also would include the replacement of the San Elijo Lagoon Bridge and Batiquitos Lagoon Bridge to their full widths, and construction 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 constructing the Voigt DAR and HOV connectors, and widening the Peñasquitos and Soledad Creeks Bridges.
- Community and regional enhancements would be implemented; including the Voigt

Drive overcrossing and realignment improvements, bike/pedestrian enhancements on both sides of San Elijo Lagoon with a bridge connection to Manchester Avenue, Villa Cardiff Drive improvements connecting to MacKinnon Avenue bridge enhancements, Santa Fe Drive bike/pedestrian improvements, Encinitas Boulevard bike/pedestrian enhancements and the NC Bike Trail, San Elijo segment.

- Environmental enhancement actions would be implemented, 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 and Dean Family Trust sites (anticipated to be underway in 2013); and the Solana Beach gateway open space preservation and Hallmark sites (east and west; anticipated to be underway in 2014); and preservation at the Batiquitos Bluffs, Laser and La Costa Preservation sites consistent with timing requirements as specified on *Table 3.17.13, Resource Enhancement Package No Net Loss Mitigation Acreage and Timing*.

By Year 2030:

- I-5 segments from the I-5 / I-805 merge to Palomar Airport Road would be upgraded to include two additional HOV/Managed Lanes. In addition, I-5 bridge improvements would occur at Carmel Creek and San Dieguito Lagoon, along with improvements to the I-5 / SR-56 Interchange.
- Community and regional enhancements would be implemented, including: bike/ pedestrian trail connections at Old Sorrento Valley Road, north of Del Mar Heights Road, Carmel Valley, Hall Property (Encinitas Community Park), Santa Fe Drive to Encinitas Boulevard (including Requeza Street), and Cottonwood Creek Park to Union Street; bike/pedestrian trails 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; bike/pedestrian improvements at seven overcrossings and five undercrossings; and the NC Bike Trail in the Cities of San Diego, Solana Beach, Encinitas, and Carlsbad.
- Environmental enhancement consisting of preservation and enhancement at Buena Vista Lagoon.

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 replacements would be completed at Agua Hedionda and Buena Vista Lagoons as well as bridge widening at the San Luis Rey River and improvements would occur at the I-5 / SR-78 Interchange.
- Community and regional enhancements would be implemented; including bike/ pedestrian trail and bridge enhancements at Agua Hedionda Lagoon; pedestrian trail and underpass enhancements north of the San Luis Rey River; bike/pedestrian overpass improvements at Division Street and at Mission Avenue; bike/pedestrian improvements at Bush Street and at 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; bike/pedestrian improvements at six overcrossings and four undercrossings; and the NC Bike Trail in the City of Carlsbad.

For a depiction of I-5 NCC Project elements by phase, please see Figures 2-4.1a through 2-4.1.c of this EIR/EIS.

ES.3.3 COSTS

Estimated costs for right-of-way and utility relocation, in 2013 dollars, would range from $235 million to $423 million, and construction costs would range from $2.1 billion to $3.4 billion. Total costs per alternative would total $3.062 billion for the refined 8+4 Buffer alternative (Preferred Alternative), $3.601 billion for the 10+4 Buffer alternative, $4.121 billion for the 8+4 Barrier alternative, and $4.495 billion for the 10+4 Barrier alternative. If approved, construction of the project is anticipated to begin in 2015.

ES.4 JOINT CALIFORNIA ENVIRONMENTAL QUALITY ACT/ NATIONAL ENVIRONMENTAL POLICY ACT DOCUMENT

The proposed project is a joint project by Caltrans and FHWA that is subject to State and federal environmental review requirements. Project documentation has been prepared in compliance with both CEQA and NEPA.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA because NEPA is concerned with the significance of the project as a whole.

After comments were received from the public and reviewing agencies, Caltrans and FHWA continued additional environmental and engineering studies. The information from these studies has been incorporated into the design and environmental evaluations presented in this document. The Final EIR/EIS is now complete and includes responses to comments received on the Draft EIR/EIS and Supplemental Draft EIR/EIS, as well as identification of a preferred alternative, as discussed in *Section ES.3* above. Following circulation of this Final EIR/EIS, if the decision is made to approve a build alternative, a Notice of Determination (NOD) will be published in compliance with CEQA and a Record of Decision (ROD) will be published in compliance with NEPA.

ES.5 ENVIRONMENTAL CONSEQUENCES

This discussion summarizes the impacts documented in the environmental analysis provided throughout *Chapter 3, Affected Environment, Environmental Consequences, and Avoidance, Minimization and/or Mitigation Measures*, and in *Chapter 4, California Environmental Quality Act Evaluation*. Each of the alternatives was evaluated at an equal level of detail for each environmental topic discussed below. A summary of impacts is provided on Table *ES.14, Summary of Potential Impacts by Alternative.*

Common to each evaluation was review of long-term project-related effects as well as shorter-term construction-period impacts. Construction activities in any one location would not exceed three years, and could be much shorter depending on the project element.

Avoidance and design (including required conformance with applicable State regulations) eliminated potential for substantial impacts to a number of resources, which therefore would not require additional mitigation. The environmental commitments and measures to minimize harm to all resources are listed in each topical section of *Chapter 3, Chapter 4,* and in the Environmental Commitments Record (ECR) in Appendix D of this Final EIR/EIS.

The environmental impacts described below for the build alternatives would not occur under the No Build alternative. Project benefits such as improved air quality, mobility, and safety also would not occur under the No Build alternative.

ES.5.1 LAND USE

Existing and Future Land Use

Any of the build alternatives would impact existing residential, commercial, agricultural, undeveloped, recreational, and roadway land uses. Land use patterns, development trends, or proposed land uses would not shift beyond parcels directly affected in the cities of San Diego, Solana Beach, Encinitas, Carlsbad, or Oceanside. The City of Del Mar is located west of the I-5 corridor. The refined 8+4 Buffer alternative (Preferred Alternative) would have the smallest project footprint and would convert the least acreage to transportation land uses.

Impacts to planned land uses would not occur. Most planned projects are at sufficient distances from the *I-5 NCC Project* to avoid impacts. For projects where edge effects may occur in the cities named above, such site-specific effects would not change the planned land uses.

Caltrans has undertaken efforts to integrate the proposed project with the adjacent and/or adjoining land uses. No mitigation measures are required.

Consistency with State, Regional, and Local Plans

The proposed project is designed to achieve consistency with the federal Coastal Zone Management Act (CZMA) and the California Coastal Act (CCA). A comprehensive multimodal program (the North Coast Corridor Public Works Plan and Transportation Resource and Enhancement Program [PWP/TREP]) has been developed to meet the applicable CCA permitting requirements and to provide the California Coastal Commission (CCC) with the information necessary for project approvals. The PWP/TREP is provided as EIR/EIS Appendix R.

The proposed project is included in SANDAG's 2050 RTP[5] and 2012 Regional Transportation Improvement Program (RTIP). Both of these documents, and the related air quality conformity determinations, have been approved by the U.S. Department of Transportation.

Potential conflicts with existing local plans would be similar for all build alternatives. While the proposed project has the potential to be inconsistent with several community and general plan element policies, including the Torrey Pines Community Plan and City of Encinitas Resource Management Element, these inconsistencies are not considered to be adverse. The proposed project would expand an existing designated major transportation corridor and has been designed to minimize impacts to existing community land use patterns. Encroachments associated with the proposed project would be discrete and would not disrupt or affect overall land use patterns within the respective jurisdictions.

Park and Recreational Facilities

The six municipalities within the project area contain parklands and/or recreational facilities. The range of park and recreational facilities located within one-half mile of the project is listed in Appendix A.

In addition to assessing park and recreation facilities, Section 4(f) of the Department of Transportation (DOT) Act of 1966 (49 United States Code [USC] §303) specifies that the Secretary [of Transportation] may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if:

[5] On December 20, 2012, the San Diego Superior Court entered a judgment finding that the EIR for the 2050 RTP is legally inadequate with regard to greenhouse gas emissions. Although the judgment may be overturned on appeal, this Final EIR/EIS has been drafted to avoid the narrow alleged deficiencies found by the Court. Where this Final EIR/EIS relies upon 2050 RTP information, that information has not been challenged or declared invalid.

There is no prudent and feasible alternative to using that land; and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use; or

consideration of any impact avoidance, minimization, and mitigation or enhancement measures, results in a *de minimis* impact on a Section 4(f) property.

Four park and recreation facilities resources would be directly impacted by the refined 8+4 Buffer alternative (Preferred Alternative), including: San Dieguito River Park, San Elijo Lagoon Ecological Reserve, Agua Hedionda Lagoon, and Oak Park. Refined 8+4 Buffer alternative design would avoid other immediately abutting facilities (Paul Ecke Sports Park and YMCA, Encinitas Hall Property Community Park, Holiday Park, Pio Pico Park, and the Center City Golf Course).

The Section 4(f) Evaluation is contained in Appendix A, which presents specific information for each of the cited facilities. Specific to the four facilities that would be permanently affected, footprint impacts would occur to two park and recreational areas where I-5 improvements would physically use portions of the park for non-recreational purposes. This would occur at San Elijo Lagoon Ecological Reserve and at Agua Hedionda Lagoon. At San Elijo Lagoon, a very small quantity of disturbed upland vegetation (less than approximately one-tenth of one percent of the facility) would be removed adjacent to an existing trail, and mitigation would be implemented. At Agua Hedionda Lagoon, minor uses of open water and undeveloped land would occur at the lagoon's boundary with I-5. This would also be mitigated. Neither of these impacts to properties protected under Section 4(f) would adversely affect activities, unique features, or attributes of any of the parks that (if lost) would affect the park's ability to function. At San Dieguito River Park, since circulation of the Draft EIR/EIS, all alternatives have been refined to avoid permanently impacting land within the park, except for providing a connection to and from the I-5 NC Bike Trail. None of the alternatives would impact the recreational nature of the park and this change would support recreational activity within the facility. It is therefore exempt from Section 4(f) protections. The Oak Park facility was identified by the City of Carlsbad as being a "special use area," without significant recreational use, and therefore is not subject to Section 4(f) protections. The agencies with jurisdiction over these parks have concurred with these assessments in writing. Documentation is provided in *Chapter 5*.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect land use, please see Section 3.1 and Appendix A of this Final EIR/EIS.

ES.5.2 GROWTH

The improved mobility expected to be achieved as a result of build alternatives could have a slight influence on demand for residential and nonresidential uses along the North Coast. It would not, however, be expected to result in the need to modify adopted General Plans to allow for greater levels of residential and non-residential development. Due to the lack of vacant or less developed land within the North Coast Corridor (potential remaining developable space totals only two to eight percent of the cities crossed by I-5, with an overall average of five percent), the build alternatives would not facilitate new development by opening up access to previously undeveloped or less developed areas.

Overall, the *I-5 NCC Project* build alternatives are expected to accommodate existing, approved, and planned growth in the area, but are not expected to influence the amount, timing, or location of growth in the North Coast Corridor.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect growth, please see Section 3.2 of this Final EIR/EIS.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect agriculture, please see Section 3.3 of this Final EIR/EIS.

ES.5.3 FARMLANDS / AGRICULTURAL LANDS

All build alternatives would impact active farmland in the Cities of Encinitas and Carlsbad, and all except the refined 8+4 Buffer alternative (Preferred Alternative) would impact active farmland in the City of San Diego. Numerical ratings for impacts to farmland for all build alternatives totaled less than the 160-point threshold established by the Natural Resources Conservation Service (NRCS) for further evaluation of adverse effects. In other words, potential impacts were considered so insubstantial that detailed analysis was not required by the NRCS.

Although none of the affected agricultural parcels meets CCA standards for prime agricultural land, most are in agricultural production, and the CCA requires that the conversion of agricultural lands to non-agricultural use be minimized.

As documented in *Section 3.3*, active agricultural parcels were evaluated for continued viability following project implementation. Active agricultural parcels would remain viable. Permanent impacts to active coastal agricultural land per CCA Section 30241 would be addressed utilizing a tiered approach including specific activities such as implementation of school or community gardens, and payment of an Agricultural Resource Impact Mitigation Fee. Temporary impacts due to construction would be addressed by returning any affected area to pre-existing agricultural use after project construction is completed.

ES.5.4 COMMUNITY IMPACTS

Community Character and Cohesion

The build alternatives have been developed through an extensive community outreach process that involves input from multiple public agencies and local community stakeholders in order to avoid impacts to human-made and natural environments. As part of the overall design process, maintaining community character and cohesion are considered throughout the project. The build alternatives have been designed and refined to address the community's concerns and to maintain community character and cohesion. With the exception of a few locations where access to the highway system would be changed and relocations would occur, the community character and cohesion of most communities would remain intact with implementation of the build alternatives.

Union Street Pedestrian Overpass

While temporary disruption of community character and cohesion could occur as a result of construction of the build alternatives, the mobility improvements and community enhancements provided by the project also would benefit most of the affected communities by providing an improved

connection within the North Coast Corridor and to the San Diego region as a whole. Within the North Coast Corridor, many project features would serve to improve and facilitate connectivity between communities east and west of I-5 in locations that have been previously bisected by the freeway, and also would provide for easier access to the coast, which provides a defining element of the I-5 coastal communities. Non-vehicular access to and through existing park and recreation areas also would be improved.

The I-5 NCC Project supports preservation of coastal community character.

Relocations

Each of the build alternatives would result in the following relocations of residential and non-residential properties:

- Refined 8+4 Buffer (Preferred Alternative) – 8 single family residences (SFR), 10 multi-family residential (MFR) units, 1 two-unit duplex, and 7 businesses
- 10+4 Barrier - 25 SFR, 79 MFR units, 8 duplex/triplex units, and 13 businesses
- 10+4 Buffer - 22 SFR, 26 MFR units, 5 duplex/triplex units, and 10 businesses
- 8+4 Barrier - 23 SFR, 36 MFR units, 8 duplex/triplex units, and 11 businesses

The build alternatives would result in some relocation of residential and non-residential properties. Although it appears there would be ample residential replacement sites for most displacees, it is possible that some may require Last Resort Housing in order to relocate to decent, safe, and sanitary housing that is within their financial means. All displacees would be treated in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the California Relocation Act. All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 USC 2000d *et seq*.). Parcel relocations would occur at the following Assessor Parcel Numbers: 261-210-21, 204-111-01, 203-320-31, 153-242-28, 153-154-24, 153-154-26, 150-245-11, 150-245-12, 150-245-02, and 148-064-14. Parcel acquisitions would not occur until right-of-way is necessary for construction purposes in Phase 3 (2030 through 2035).

Environmental Justice

Impacts associated with the project would affect communities along the corridor in similar ways and are generally not anticipated to disproportionately impact low-income or minority populations. Specific encroachments required through right-of-way expansion along the corridor, however, may affect isolated low-income or minority populations.

Both the 8+4 Buffer (Preferred Alternative) and 10+4 Buffer alternatives would avoid environmental justice impacts to the residents of a 47-unit apartment complex in Barrio Carlsbad, which is occupied by some low-income and minority populations. The 10+4 Barrier alternative would impact this entire 47-unit apartment complex and there may not be adequate nearby relocation opportunities within a similar community. The 8+4 Barrier alternative would impact 10 units of this 47-unit apartment complex. Selection of the 8+4 Buffer, Preferred Alternative, would result in no disproportionate impacts occurring and no requirement for disproportionate adverse impacts to low income or minority populations.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect communities, please see Section 3.4 of this Final EIR/EIS.

ES.5.5 UTILITIES AND EMERGENCY SERVICES

The build alternatives would not result in increased population or demand for public services in the North Coast Corridor because they would not construct new housing or businesses. The project would impact cable television, gas, electric, sewer, telephone, fiber optic, and water utility lines. These include both distribution and transmission lines that could require either relocation or protection in place. Caltrans is working to avoid relocation of larger than 50 kilovolt (kV) electric transmission facilities owned and operated by SDG&E adjacent to the Encina Power Plant. Also, proposed by NRG Energy, Inc. and as discussed in *Chapter 1*, the Carlsbad Energy Center is using approximately 23 acres (ac) of the Encina Power Plant. Regardless, it is not anticipated that utility services would be interrupted during construction and utility relocation activities. Coordination between Caltrans and utility companies has been ongoing and would continue throughout the final design and construction process.

Large kV transmission lines adjacent to Encina Power Plant

Response time for emergency services and law enforcement would be likely to improve with implementation of the build alternatives. This would be due to an anticipated reduction in overall traffic congestion and improved street and freeway access. During construction activities there may be temporary increases in response times for emergency services due to detours and road closures. A Traffic Management Plan (TMP) would include various strategies to minimize delay during construction.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect utility and emergency services, please see Section 3.5 of this Final EIR/EIS.

ES.5.6 TRAFFIC AND TRANSPORTATION / PEDESTRIAN AND BICYCLE FACILITIES

It is anticipated that any of the build alternatives would improve future conditions for projected total delay,[6] congested hours, and travel time in the I-5 North Coast Corridor when compared to no build conditions. See *Tables ES.15* through *ES.17*.

As described in *Section ES.2.2*, morning peak hour travel time in the North Coast Corridor in 2035 under the No Build alternative is forecasted to be between 29 and 37 min for northbound travelers and between 53 and 54 min for southbound travelers. Afternoon peak hour travel time would be between 67 and 69 min for northbound travelers and between 40 and 48 min for southbound travelers. See *Table ES.15, Total Delay, Congestion Hours, and Travel Time.*

Total weekday delays in 2006 (baseline) conditions in the northbound and southbound directions were 3,500 and 4,700 vehicle hours respectively, for the general purpose lanes on a daily basis. Under the year 2030 No Build alternative, the projected total weekday delay in the northbound direction is 13,700 vehicle hours. The total weekday delay for the southbound direction would be 14,000 vehicle hours.

[6] The Draft EIR/EIS traffic analysis was based on SANDAG's Series 10 2030 traffic forecasts. Detailed evaluation of those forecasts in comparison to the current Series 12 forecasts indicates that the analysis is now representative of what is expected to occur within the 2040 to 2050 timeframe, as described in *Section 3.6*.

Tables ES.16, Northbound AM and PM Weekday Peak Period Congestion Duration, and *ES.17, Southbound AM and PM Weekday Peak Period Congestion Duration,* forecast the duration of congestion for the respective direction of travel and time of day. Congestion in the northbound direction under 2030 no build conditions is estimated to be approximately three and a half hours during a.m. peak hours and six hours during p.m. peak hours. The southbound direction for this scenario is forecasted to experience congestion for six hours in the a.m. peak hours and seven hours in the p.m. peak hours.

Time savings would be greatest with one of the 10+4 build alternatives. With the 8+4 build alternatives, the average peak travel time for northbound traffic in the general purpose lanes would be between 27 and 29 min in the morning (2 to 8 min faster than no build conditions), and between 45 and 50 min (19 to 22 min faster, than no build conditions) in the afternoon in 2030. The southbound travel time would be between 36 and 47 min in the morning and between 29 and 30 min in the afternoon, for a time savings of 7 to 17 min in the a.m., and 11 to 18 min in the p.m., respectively. HOV/Managed Lanes would be managed to allow free-flow conditions, providing a more reliable travel time of approximately 25 min within the 27-mile project area when driving at 65 mph.

The Managed Lanes element of the project would also support public transit as it becomes more available with extension of bus routes and increases in bus and rail frequency. The Managed Lanes would improve public transit reliability, and would be expected to help make public transit a more viable option for travelers requiring travel time certainty.

Also as discussed in *Section ES.3*, above, the project would include a number of potential pedestrian and bicycle facilities as project enhancements. These facilities would improve the existing pedestrian and bicycle circulation. These enhancements would improve non-vehicular access for both north-south and east-west travelers, improving access to coastal resources for residents and visitors to the North Coast Corridor. Design and construction of these features would occur in coordination with each affected city and include formal cooperative agreements between Caltrans and each city, where Caltrans would build these features at the same time as the roadway and bridge improvements and the cities and Caltrans agree on responsibility for their maintenance.

Proposed San Dieguito Pathway and North Coast Bike Trail suspended from east side of bridge

The I-5 NCC Project prioritizes moving people, not vehicles; and would improve coastal access.

During construction, a construction phasing plan would be implemented to identify the sequence of construction and help to minimize traffic delays. A TMP would detail a variety of elements necessary to increase driver and area resident awareness, ease congestion, and minimize delay during construction. For instance, along with other items, the TMP would address public outreach to increase public knowledge of project activities, specifics related to incident response in case of accident, detour information where necessary, and alternative temporary access where required.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect traffic, transportation, and pedestrian and bicycle facilities, please see Section 3.6 of this Final EIR/EIS.

ES.5.7 VISUAL / AESTHETICS

In the North Coast Corridor area, I-5 parallels the Pacific coastline to the west and the coastal ranges to the east. This is a unique setting in that the existing freeway crosses rolling terrain, urbanized land uses and canyon topography. I-5 also traverses five lagoons, and several rivers and creeks. I-5 right-of-way would become noticeably more urban in nature, and some scenic resources now available to the traveling public would become less visible. The loss and diminished open views that provide variety, interest, and orientation to the traveler would change the visual character of I-5. Views from the freeway would be diminished in quantity and quality by the introduction of walls, structures and appurtenances (overhead signs, traffic sensors, video cameras, etc.). All existing ocean views would be retained.

Existing view west from San Dieguito Lagoon crossing

Future proposed view west from San Dieguito Lagoon crossing

Each build alternative would increase pavement; primarily within existing Caltrans right-of-way, and proportionally displacing landscaped roadside areas and adding large retaining walls that would enable the new roadway to cut through and cover over existing topography. The sense of enclosure created by some stretches of sound and/or retaining walls would be similar to the travel experience one now encounters in large urban areas to the north, thereby diminishing the region's unique visual identity as seen from I-5. Landscaping would be notably different. The prominence of tall trees in the freeway landscape would be reduced. This would be caused by space limitations as well as the limitations of San Diego's coastal native tree palette. Newly installed landscaping would be native and receive minimal or no irrigation once established, which would reduce vegetation variety and level of "green" at some times of year.

These are major changes to the existing visual character, but the changes are largely restricted to the I-5 right-of-way. The level of perceived visual change along I-5 would immediately diminish as the viewer leaves highway right-of-way, because the freeway is linear in nature and edged by both rolling terrain and development. Off-site views to the highway are mostly obscured by this intervening topography or other built uses.

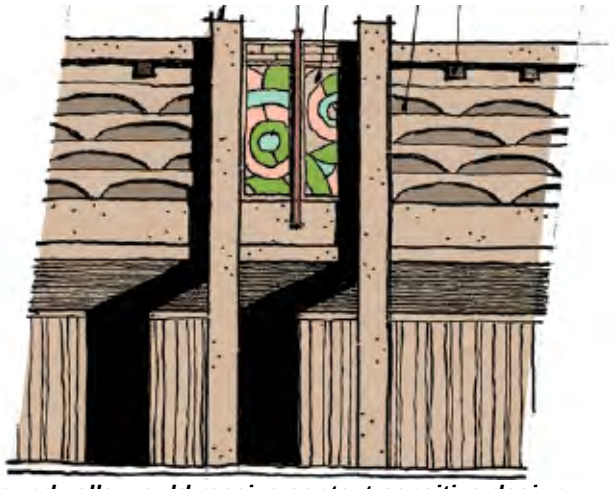
Existing view toward Agua Hedionda Lagoon from southbound I-5

Future view toward Agua Hedionda Lagoon from southbound I-5, with proposed retaining wall, removed invasives, and more open view

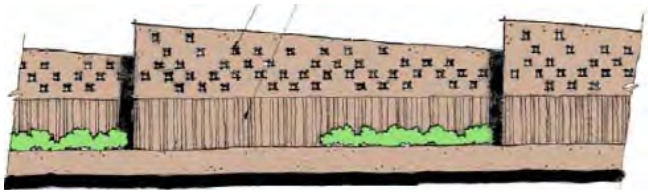
Views toward bridges from open space would have little visual change from the more developed sections of the corridor, because there are no planned soundwalls and a restricted use of retaining walls in those areas.

Continued consideration of a number of design elements following circulation of the Draft EIR/EIS would reduce undesirable project visual effects. Elimination of two DARs (Cannon Road and Oceanside Boulevard) from the project and redesign of the Manchester DAR have substantially reduced visual impacts associated with these features from those anticipated during Draft EIR/EIS public review. Also following circulation of the Draft EIR/EIS, Caltrans developed the project Design Guidelines (Appendix L). These guidelines reflect comments received during public outreach meetings with interested community groups, city staff members, regulatory agencies, and the general public. The guidelines specifically address wall and bridge design, treatment of invasive plant species, and use of natives. Interchanges providing entries to cities would be designed in consultation with the local jurisdictions.

Mitigation measures therefore include facility design modifications, architectural detailing, and landscaping, all of which would lower the level of perceivable visual change. The mitigation measures incorporate the principles of context sensitive solutions, worker safety design features, and "sustainable" landscape design. Nonetheless, long-term adverse impacts would be associated with the construction of all build alternatives. A high degree of visual change caused by the project would remain despite the implementation of these measures.



Soundwalls would receive context-sensitive design, such as this wall proposed at Pio Pico Park, or



This example of a Southern Bluff Theme showing an articulated, perforated soundwall

If you are interested in reading more about how the I-5 NCC Project alternatives would affect project area aesthetics, please see Section 3.7 of this Final EIR/EIS.

ES.5.8 CULTURAL RESOURCES

There are 16 known archaeological sites along I-5 and on proposed biological mitigation parcels that are eligible or potentially eligible to the National Register of Historic Places/California Register of Historic Places (NRHP/CRHP). These sites would not be adversely affected and would be protected from impact through implementation of an Environmentally Sensitive Area (ESA), which would protect the sites from direct and indirect project-related effects. Use of this standard condition resulted in a National Historic Preservation Act Section 106 Finding of No

Adverse Effect for archaeological sites (per 36 CFR 800).

One historic structure (i.e., built environment resource) within the Area of Potential Effect was determined eligible for the NRHP/CRHP. No historic structure would be adversely impacted. A small right-of-way sliver from this property would be required to construct the project; however, the qualities that make the resource significant would not be adversely affected by this sliver take. A DOT Act of 1966 Section 4(f) evaluation and finding is required for this resource. The Section 4(f) use would be *de minimis* because the small sliver needed from the property would not result in an adverse effect.

Coordination with the State Historic Preservation Officer (SHPO) has been ongoing, with final SHPO concurrence in assessments of resource value and the impact findings with no standard conditions received on September 11, 2013 (see *Figure 5-5.10* in *Chapter 5, Comments and Coordination*. Should (unanticipated) potentially eligible sites be located during project construction, mitigation measures as identified in *Section 3.8* would be applied.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect prehistoric or historic cultural resources, please see Section 3.8 of this Final EIR/EIS.

ES.5.9 HYDROLOGY / DRAINAGE (AND FLOODPLAINS)

Two of the six existing lagoon bridges (crossing Carmel Creek at Los Peñasquitos Lagoon and at San Dieguito Lagoon) have been recently constructed. Necessary transportation improvements proposed under this project would result in minor changes that do not require replacing those two existing bridges. The remaining four lagoon bridges would be replaced due to the age of the existing bridges and increased width required for the project. These bridges include 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, showed no substantial benefit to tidal or fluvial flows would result from a wider channel. Therefore, although the existing bridge represents a minor 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. Additional technical studies were undertaken to identify how the replacement bridges could be designed to optimize tidal and fluvial flows, with final bridge length and width information addressed in this Final EIR/EIS.

All four build alternatives would have similar impacts to hydrology, drainage, and floodplains of the 12 waterways crossed by the project. No floodplain encroachments parallel to the direction of water flow, also called longitudinal encroachments, would occur. No effects on upstream 100-year water surface elevations would occur at Los Peñasquitos Creek or Cottonwood Creek, and there would be decreases in upstream 100-year water surface elevations for Carmel Valley Creek, Buena Vista Lagoon, and Batiquitos Lagoon. Negligible increases in upstream 100-year water surface elevations would occur for Soledad Canyon Creek, San Dieguito River, San Elijo Lagoon, Encinas Creek, Agua Hedionda Lagoon, Loma Alta Creek, and the San Luis Rey River.

The project would not have any major flooding risks. No additional roadways would flood upstream from the proposed I-5 bridges.

Design refinement continuing after circulation of the Draft EIR/EIS and the Lagoon Optimization Studies conducted and circulated as part of the Supplemental Draft EIR/EIS has resulted in

further minimization of impacts to waterways in the project corridor. Widening of the channel would occur at the three bridges with increased lengths, and increased channel depth at Batiquitos and Buena Vista Lagoons (as well as potentially at San Elijo Lagoon) would support a return to less constricted flow conditions.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect hydrology, drainage, or floodplains, please see Section 3.9 of this Final EIR/EIS.

ES.5.10 WATER QUALITY AND STORMWATER RUNOFF

Water quality may be impacted during construction and operation of the proposed project. Construction activities such as clearing and grubbing, grading, sandblasting, and landscaping can generate pollutants--including vehicle fluids, solvents, thinners, waste lumber, concrete rubble, and litter. During operation, potential sources of pollutants found in highway runoff include sediment, nitrogen, phosphorus, fertilizers, pesticides, and metals. Runoff volumes increase with the acreage of impervious area. The 10+4 Barrier alternative would have the highest percentage of additional impervious area, followed by the 8+4 Barrier alternative and 10+4 Buffer alternative. The refined 8+4 Buffer alternative is the Preferred Alternative and would create the lowest percentage of additional impervious area and the least additional runoff.

Potential impacts to water quality during construction would be prevented or minimized by applying construction site BMPs, while the potential operational impacts would be prevented or minimized by implementing design pollution prevention BMPs, "treatment" BMPs, and maintenance BMPs.

No negative impacts to the water quality of the six designated "navigable" waterways are predicted. These are the San Luis Rey River, and the Agua Hedionda, San Elijo, San Dieguito, Buena Vista, and Batiquitos Lagoons.

Seven percent of existing I-5 impervious areas is being treated. Implementation of the refined 8+4 Buffer alternative would result in a total of 112 percent of equivalent new impervious areas being treated. The Preferred Alternative, therefore, would result in a total of 27 percent of total impervious areas (existing and new) being treated and would result in an improvement over existing conditions.

A bioswale storm water runoff treatment feature adjacent to I-5 between Palomar Airport Road and Cannon Road

If you are interested in reading more about how the I-5 NCC Project alternatives would affect water quality and storm water runoff, please see Section 3.10 of this Final EIR/EIS.

ES.5.11 GEOLOGY / SOILS / SEISMICITY / TOPOGRAPHY

Due to the proximity of the project area to the Newport Inglewood-Rose Canyon Fault Zone, the roadway, structures, and other features of the build alternatives could be impacted by strong ground motion, liquefaction, seismically induced settlement, and embankment spreading, although ground surface rupture and cracking are considered unlikely. Slope stability could be adversely affected

by seeps, springs, ephemeral streams, and perched water that have been identified within the project limits. Fill material from local excavation is generally expected to be adequate for roadways and retaining walls, but the soft lagoonal deposits may be subject to settlement and bearing capacity failure due to the placement of additional surcharge. Many of the drainage features in the project area would require rerouting, upgrading, and/or extending to accommodate a wider freeway facility, and other existing utilities conflicting with proposed construction activities would require protection or relocation during construction.

Design and construction of the project to current highway and structure design standards, including Caltrans Standard Plans, Standard Specifications and applicable seismic standards, would minimize these potential impacts on the build alternatives.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect or be affected by geology, soils, seismic issues, and/or topography, please see Section 3.11 of this Final EIR/EIS.

ES.5.12 PALEONTOLOGY

Direct impacts to paleontological resources could occur when earthwork activities, such as mass grading operations or cuts, extend into geological deposits containing fossils. Geologic formations within the project footprint have the potential to contain important fossil remains, including both marine and non-marine vertebrates and invertebrates. The four build alternatives would disturb similar areas along the I-5 corridor and would have similar effects on paleontological resources. Impacts would be mitigated during construction through a program consisting of monitoring, fossil salvage, macrofossil and microfossil analysis, fossil preparation, report preparation, and curation.

During grading in areas potentially containing fossils, monitoring would occur and fossils of scientific value found during construction would be collected for analysis

If you are interested in reading more about how the I-5 NCC Project alternatives would affect paleontological resources, please see Section 3.12 of this Final EIR/EIS.

ES.5.13 HAZARDOUS WASTE / MATERIALS

All build alternatives would potentially result in the discovery of contaminated materials that are routinely located in areas with long-term development and/or that have been in agricultural production. These include aerially deposited lead in the soil in the I-5 median and shoulders; petroleum hydrocarbons in soils and groundwater underlying service stations; pesticides and herbicides in shallow soils on and around nurseries and farmlands; asbestos in bridge joint and piping material; lead-based paint on metal guardrails, piping, or in structures to be demolished; and creosote on wooden guardrail posts and signposts.

Standard measures that would be taken to minimize risks during construction include avoidance of identified hazardous areas; development of site-specific Soil Management Plans and Health and Safety Plans; testing and reuse or proper off-site disposal of contaminated soils; and implementation of proper handling and disposal measures for asbestos, lead, and treated wood wastes.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect or be affected by hazardous materials, please see Section 3.13 of this Final EIR/EIS.

ES.5.14 AIR QUALITY / CLIMATE CHANGE

Air Quality

The proposed project is located in the San Diego Air Basin (SDAB).

Six pollutants that have been linked to potential health concerns are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), lead (Pb), and sulfur dioxide (SO_2), and are identified as "criteria pollutants." Federal standards are set for SO_2, CO, NO_2, O_3, respirable PM (sized 10 microns or under [PM_{10}]), fine PM (sized 2.5 microns or under [$PM_{2.5}$]), and Pb. California State standards exist for the same pollutants, plus hydrogen sulfide (H_2S) sulfates, vinyl chloride and visibility reducing particles. The State's standards are generally more stringent than the federal counterparts.

The SDAB is an "attainment" area for federal PM_{10} and $PM_{2.5}$ standards, and is a "nonattainment" area in terms of PM_{10} and $PM_{2.5}$ State standards. The SDAB was designated as a "marginal non-attainment" area for the federal eight-hour (hr) O_3 standard in December 2012. California State standards do not use the "marginal" category; the State currently classifies the SDAB area as "serious-nonattainment" for O_3. The SDAB is in federal attainment/maintenance for CO, after redesignation in 1990. The SDAB currently meets the federal and State air quality standards for all of the other criteria air pollutants.

The proposed project would improve traffic operations by smoothing traffic flow. The proposed project is therefore in conformance for federal PM_{10} and $PM_{2.5}$ standards and is unlikely to increase the frequency or severity of any existing exceedances regarding the nonattainment of State PM_{10} and $PM_{2.5}$ standards.

Based on an analysis of maximum one-hr average CO concentrations at selected intersections in the proposed project limits, the proposed project's future traffic conditions would not exceed federal and State one- or eight-hr standards during the a.m. or p.m. peak periods at any of the analyzed intersections. All other intersections in the project area are predicted to experience less delay time and improved operating conditions. The results of the quantitative CO hotspot analysis show that the proposed project would not adversely impact this aspect of the local air quality.

A quantitative Mobile Source Air Toxics (MSAT) analysis was conducted; the results indicate that a substantial decrease in MSAT emissions can be expected for the proposed alternatives from the base year (2006) levels through future year levels. This decrease is consistent with a USEPA study that projects a substantial reduction in on-highway emissions of benzene, formaldehyde, 1,3-butadiene, acrolein and formaldehyde between 2000 and 2020. All build alternatives are expected to reduce emissions of diesel particulate matter (DPM) well below the base year values, ranging from 26 to 37 percent less for the operational year (2015) to 42 to 44 percent less for the horizon year (2030). These projected reductions are achieved while the total vehicle miles traveled (VMT) for the alternatives increase by approximately 32 to 37 percent in 2030 from the base year value depending on the alternative. The build alternatives result in slightly higher VMT and emissions when compared to the No Build alternative. The build alternatives substantially relieve congestion, however, and MSAT emissions are projected to be substantially less than existing conditions for the build alternatives, even though these alternatives are projected to carry greater traffic loads. This would represent an improvement over existing conditions.

During construction activities, including utility relocation, short-term degradation of air quality may occur due to the release of particulate emissions. The effects on air quality would be

greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transportation of equipment to and from the site. These emissions would be temporary and limited to the immediate area, and therefore would not adversely affect regional air quality.

Regional and project-level conformity analyses were conducted relative to conformity requirements under the federal Clean Air Act. The *I-5 NCC Project* demonstrates conformity with all federal conformity requirements.

Climate Change

In California, transportation sources emit the greatest amount of greenhouse gas (GHG), primarily carbon dioxide (CO_2) from fossil fuel combustion. The four primary strategies for reducing GHG emissions from transportation sources are: (1) improving the transportation system and operational efficiencies, (2) reducing the growth of VMT, (3) transitioning to lower GHG emitting fuels, and (4) improving vehicle technologies.
The most severe emissions occur from vehicles travelling at 0-25 mph. Enhancing operations and improving travel times would reduce GHG emissions, particularly CO_2. Based on modeling of the project alternatives, each of the build alternatives would reduce CO_2 emissions by hundreds of tons per day when compared to the No Build alternative. These decreases would be due to the decreased congestion and improved travel efficiencies along the corridor. GHG emissions may be further reduced with the project due to vehicles spending less time idling on local streets.

In addition, where feasible, the following measures are included in the project to reduce GHG emissions and potential climate change impacts: (1) implementation of ITS to help manage the efficiency of the existing highway system; (2) providing ridesharing services and park and ride facilities; and (3) incorporating energy efficient lighting, such as light-emitting diode (LED) traffic signals.

Caltrans continues to work on assessing system vulnerability to climate change, including the effect of sea level rise. For the project, a review of lagoon and tributary crossings along I-5 indicates there is ample freeboard to accommodate the 100-year flood event and projected year 2100 sea level rise at all water crossings except at Carmel Creek. A small deficiency there would be addressed through expected maintenance of I-5 access at this location, with the potential for traffic to be rerouted to alternative routes for short periods of time if necessary. No redesign of this project element is deemed necessary.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect air quality and climate change, please see Sections 3.14 and 4.6 of this Final EIR/EIS.

ES.5.15 NOISE

Traffic noise modeling results for the build alternatives compared the predicted design-year traffic noise levels with the project to existing conditions and to the design-year no build conditions. The comparison to existing conditions was included in the analysis to identify traffic noise impacts under 23 CFR 772 per NEPA (the CEQA noise analysis is presented in *Chapter 4*). The comparison to the future no build condition indicates that the traffic noise will increase due to the proposed project as well as to unrelated changes in I-5 use (due to increases in regional population, for example).

Traffic noise is predicted to occur throughout the I-5 North Coast Corridor. As a result, soundwalls were evaluated throughout the length of the project for all sensitive land use categories, including residential areas, schools, and parks. The location, length, and height of currently proposed or recommended soundwalls are described in detail in *Section 3.15*, and summarized in *Table ES.18a*, *Recommended Soundwalls*. Soundwalls are recommended when the cost of the soundwall is within the allowance per benefitted residence. If design or cost allowance parameters change

during final design, or if property owners reject a proposed wall, additional walls could be added or deleted from those proposed in this Final EIR/EIS. Seven soundwalls were close to meeting the allowance per benefitted residence and are not proposed as part of this project. These soundwalls are identified for secondary consideration, which entails reviewing the reasonableness of the soundwall during final design (see end of *Section 3.15.4* for additional discussion). These seven soundwalls are summarized in *Table ES.18b*.

Proposed soundwall locations along I-5

If you are interested in reading more about how the I-5 NCC Project alternatives would affect or be affected by noise, please see Section 3.15 of this Final EIR/EIS.

ES.5.16 ENERGY

When balancing energy used during construction and operation against energy saved by relieving congestion and other transportation efficiencies, the project would not have substantial energy impacts. Specifically, additional auxiliary and HOV/Managed Lanes, new and expanded park and ride facilities, improved bike lane and sidewalk features, ramp metering, and an improved transit-highway interface would improve traffic conditions over no build conditions, and thus reduce overall energy consumption, as more people carpool or choose other modal options. Comparing alternatives, the two barrier alternatives may require a slightly higher indirect consumption of energy due to increased maintenance activities required to sweep trash that would likely collect at barriers separating the HOV/Managed Lanes from the general purpose lanes.

All build alternatives would represent an improvement over the No Build alternative, which would contribute to continued traffic congestion and inefficient energy use by vehicles idling along I-5 and on local roadways.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect energy, please see Section 3.16 of this Final EIR/EIS.

ES.5.17 NATURAL COMMUNITIES

The developed North Coast Corridor contains a variety of habitats from sensitive native habitats to disturbed or degraded habitats, including some of those abutting I-5. Each of the four build alternatives would impact the same types of habitats; with slight differences in total impacts depending on the footprint. Sensitive upland habitats impacted include good quality and disturbed habitats of the following: Baccharis scrub, coastal sage scrub [CSS]), maritime succulent scrub, native grassland, and southern maritime chaparral. Sensitive wetland habitats impacted include southern coastal salt marsh, coastal brackish marsh, coastal brackish marsh (disturbed), mud flat, and open water; these impacts are primarily related to implementing project features at the lagoons. Depending on the alternative selected, permanent impacts to sensitive upland habitats would total between 63.72 ac and 69.43 ac. Depending on the selected alternative, permanent impacts to riparian and wetland habitat would total between 18.44 ac to 25.55 ac. The refined 8+4 Buffer alternative (Preferred Alternative) would have the fewest permanent impacts of the four build alternatives: 63.72 ac of sensitive upland and 18.44 ac of riparian and wetland habitat.

Lagoon optimization studies and bridge reviews, building upon earlier studies addressing tidal flows and channel function, evaluated these regionally important biological features of the North Coast Corridor. These further analyses identified optimal channel widths, depths, and associated bridge lengths associated with tidal and fluvial flows. Existing and proposed bridge dimensions, as well as known environmental concerns are summarized on *Tables ES.5* through E*S.10*. These include potential effects of the modified channels under the bridges on tidal circulation, flood flows and associated scour, sediment transport, sea level rise relative to freeboard, wildlife connectivity, channel protection features, and associated impacts on wildlife habitats and federal or State jurisdictional waters/wetlands due to the proposed designs. 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 – San Luis Obispo – San Diego [LOSSAN] railroad double tracking project; which is generally east of Coast Highway).

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.

I-5 currently acts as a wildlife barrier to east-west movement. Each of the lagoon, river, and creek crossings are potential corridors for wildlife to cross from east to west to access surrounding upland habitats. Widening the freeway would not necessarily cut off these corridors; however, existing crossings could become less attractive for use by wildlife. To eliminate this possibility, new bridges over the lagoons have been designed with a bench at the abutment or with improved under-crossings to facilitate wildlife movement. Corridors at locations where bridges would not be replaced, such as the San Dieguito Lagoon and the San Luis Rey River, would not be further constrained due to the existence of large areas for wildlife movement and the minimal increases to bridge width.

Appropriate fencing of project-improved park and rides, paths and the NC Bike Trail would keep users on the facilities and would substantially reduce any adverse impacts otherwise occurring by users leaving the facility and entering native habitat.

The North Coast Corridor 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.

Opportunities for compensatory mitigation have been reviewed in all the watersheds along the I-5 corridor to mitigate for impacts remaining following project avoidance and minimization. CSS occupied by California gnatcatcher provides a priority for acquisition and restoration. Coastal lagoon habitats are also a focus for wetland mitigation. Regionally important mitigation in the I-5 corridor has been discussed with the resource agencies, and a regional Resource Enhancement and Mitigation Program (REMP);[7] has been developed to provide for mitigation planning and implementation. The REMP has been developed for the *I-5 NCC Project* and other regionally important projects (including the San Diego County portion of rail improvements associated with the LOSSAN rail corridor) and some other North Coast Corridor transportation improvements. 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.

Given the unique value of the corridor lagoons, opportunities to improve the ecological function of these systems exceed the benefits of ratio-based mitigation efforts on the relatively small, fragmented, and isolated land areas remaining in the North Coast Corridor. The REMP 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. This process would effectively mitigate *I-5 NCC Project* impacts in a manner that addresses regionally significant resource enhancement and preservation needs.

Construction mitigation identified in the REMP measures include strategically acquiring restoration opportunities for no net loss of wetland and upland ESHA,[8] purchasing and preserving existing ESHAs, and enhancing lagoon system function and values through transportation facility infrastructure improvements and funding of one large lagoon restoration project, all within the North Coast Corridor coastal zone area. The REMP also provides for enhancement/ endowments for maintenance of two lagoon inlets, and comprehensive lagoon restoration through transportation facility infrastructure improvements and funding of major restoration efforts.

Native upland vegetation would be created/restored at the Dean Mitigation Site, at the Deer Canyon II Upland Mitigation Site, and on the slopes of the San Dieguito Lagoon W19 restoration. The Hallmark Mitigation Sites have areas where some CSS can be created and other areas with existing disturbed/sparse CSS that would be restored on site. In addition, several parcels have been purchased as North Coast Corridor mitigation to preserve important linkage areas and habitats that were originally slated for development. 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.

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. The REMP also establishes endowments for long-term management of the lagoon inlets at Los Peñasquitos Lagoon and Batiquitos Lagoon, as well as long-term management of REMP mitigation sites. One large-scale lagoon restoration would be

[7] For the reader's ease of reference, please note that the REMP was referred to as a Resource Enhancement Program [REP] in the Supplemental Draft EIR/EIS).

[8] "No net loss" is a one to one replacement of impacted habitats with habitat of equal or greater value in terms of acreage and/or function will replace it.

funded as part of the REMP to enhance lagoon functions and services.

The I-5 NCC Project would preserve, restore, and enhance sensitive coastal habitat through participation in the REMP.

Overall, the REMP 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. Implementation of the REMP would support ecological lift; i.e., an ecological betterment over the no build baseline condition, throughout the North Coast Corridor coastal zone.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect natural communities, please see Section 3.17 of this Final EIR/EIS.

ES.5.18 WETLANDS AND OTHER WATERS

The I-5 freeway extends north-south and crosses six lagoons, a river, and additional smaller drainages with watersheds that drain from east to west. The build alternatives all are variations of widening of the existing facility, and all involve impacts to wetlands.

Project concerns included the potential for permanent impacts to the lagoon habitats that could result in a corresponding decrease in the quality and quantity of important coastal habitat available for use by wildlife species and reduce flood relief and water quality functions. The project would also affect the San Luis Rey River and smaller drainages feeding into Cottonwood Creek, Encinas Creek, and those parallel to I-5 north of Genesee Avenue by placing them into culverts or potentially placing fill into these waterways. These concerns have been substantially reduced as a result of project refinement that includes three longer bridges which would allow for deeper and wider channels that would, in turn, benefit water quality. Temporary impacts to waters of the U.S. and State wetlands would include disturbance to open water areas from the use of barges, coffer dams, falsework, or other construction methods while the new bridges are being constructed or while the old bridges are being removed.

Permanent impacts to State wetlands range from 18.44 to 25.55 ac; however, due to lengthening bridges and widening channels approximately 2.52 ac of new wetlands will be established to offset some of the impacts within the project footprint. Therefore, net permanent impacts to USACE waters of the U.S. would range from 11.61 ac under the refined 8+4 Buffer alternative (Preferred Alternative) to 17.17 ac under the 10+4 Barrier alternative. Net permanent impacts to State wetlands would range from 15.92 ac under the refined 8+4 Buffer alternative to 23.03 ac under the 10+4 Barrier alternative. Temporary impacts to USACE waters of the U.S. would range from 14.82 ac under the refined 8+4 Buffer alternative to 20.13 ac under the 10+4 Barrier alternative. Temporary impacts to State wetlands would range from 18.39 ac under the refined 8+4 Buffer alternative to 21.95 ac under the 10+4 Barrier alternative.

The refined 8+4 Buffer alternative would have the smallest total acreage of impacts to jurisdictional waters of the U.S. and State wetlands, and would have the fewest permanent impacts to USACE jurisdictional waters of the U.S. in each watershed. The smaller impact footprint of this alternative incorporates both the narrowest bridge option, as well as lengthening of three lagoon bridges (San Elijo, Batiquitos and Buena Vista) over deeper and wider channels.

Direct and indirect impacts would be mitigated so that there would be no loss of any wetlands

acreage, or "no net loss," in accordance with State and federal permit requirements. The REMP, with mitigation implementation that would precede impact occurrence (by up to approximately 15 years in some instances), would support improvement of these valuable wetlands and other waters. In addition, substantial enhancements to the coastal lagoons would also be implemented as part of the REMP. These would include funding a large scale lagoon restoration project, an endowment to maintain the inlets of Los Peñasquitos Lagoon and Batiquitos Lagoon, and preservation of some important upland parcels. In addition, providing longer bridges and wider channels at San Elijo, Batiquitos, and Buena Vista Lagoons would allow for greater tidal range, lower residence time, and carry greater fluvial flows to allow for better water quality in these lagoons.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect wetlands and other waters, please see Section 3.18 of this Final EIR/EIS. For summary information on timing of mitigation relative to impacts, see ES.3.2, above.

ES.5.19 PLANT SPECIES

Varying numbers of different sensitive plant species, including Del Mar sand aster, Nuttall's scrub oak, Orcutt's pincushion, sea dahlia, southern tarplant, wart-stemmed ceanothus, San Diego barrel cactus and Torrey pine, would be impacted by each of the build alternatives. The Torrey pines that would be impacted were planted within the I-5 right-of-way and are not naturally occurring.

Relatively large numbers of Del Mar sand aster (694 to 763 individuals) and Orcutt's pincushion (869 to 1,312 individuals) would be impacted; however, fewer than 75 individuals of other sensitive plants would be affected. The refined 8+4 Buffer alternative (Preferred Alternative) would impact the fewest numbers of sensitive plants.

Seed would be collected or plants would be salvaged to the extent practicable in project impact areas. Salvaged plants and seed would be planted in mitigation sites, on revegetated new slopes, or in revegetated areas that were temporarily impacted.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect plant species, please see Section 3.19 of this Final EIR/EIS.

ES.5.20 ANIMAL SPECIES

Impacts to CSS, southern maritime chaparral, and/or maritime succulent scrub could impact a variety of animal species, including the San Diego horned lizard, Coronado Island skink, orange-throated whiptail, rufous-crowned sparrow, least bittern, raptors, loggerhead shrike, desert woodrat, and San Diego pocket mouse. Some bat species may occasionally use the lagoon bridges and may be impacted. As noted throughout this *Executive Summary*, project-related impacts would proportionally increase over those already occurring and related to the existing I-5 and corridor development. Project-related impacts to these species would increase slightly as the alternatives grow in facility size based on number of lanes and buffer or barrier use. Measures to avoid and minimize impacts to these sensitive species, such as vegetation clearing outside the breeding season, have been included as conservation measures. In addition, mitigation identified in the REMP for sensitive habitats would provide mitigation for these species.

The open water in the lagoons, and potentially in the San Luis Rey River, provides essential fish habitat (EFH) for Pacific groundfish and the coastal pelagic species group, which includes northern anchovy, Pacific sardine, Pacific mackerel, and jack mackerel. Replacement and construction of the bridges for any of the build alternatives may adversely affect EFH.

All impacts to animal species (both temporary and permanent) are being addressed through project design (including project footprint minimization and construction timing restrictions) as well as mitigation measures identified in the project REMP. Project bridge improvements would result in water quality improvements and improved habitat for wildlife species, and would achieve the overall goal of enhancing biodiversity and habitat value throughout the corridor, resulting in a betterment over the no build condition.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect animals, please see Section 3.20 of this Final EIR/EIS.

ES.5.21 THREATENED AND ENDANGERED SPECIES

Each of the build alternatives would permanently impact six Del Mar manzanita plants, but in general, the refined 8+4 Buffer alternative (Preferred Alternative) would have the least permanent and temporary impacts to other threatened and endangered species. This alternative would permanently impact portions of 12 to 15 coastal California gnatcatcher territories, permanently impact one Belding's savannah sparrow territory and temporarily impact a second territory, permanently impact one light-footed clapper rail territory, and temporarily impact three light-footed clapper rail territories. Some southern willow scrub habitat that may be used by least Bell's vireo and southwestern willow flycatcher as they migrate to their nesting grounds would be impacted, but the majority of this habitat impacted by the 8+4 Buffer alternative is disturbed and in small patches and is unlikely to be used by these two species. Habitat occupied by tidewater goby and used for migration by steelhead trout would be impacted at the San Luis Rey River.

Designated critical habitat for the least Bell's vireo, southwestern willow flycatcher, tidewater goby, and the California gnatcatcher fall within the project footprint of all of the build alternatives and would be impacted. In addition, all build alternatives would have slight (incremental) increases to indirect effects such as increased dust, lighting, invasive species, and noise that already affect sensitive species due to the current configuration of I-5.

The slight increases in lighting, exposure to invasive species, edge effects, long-term increases in noise, etc. are expected to have a minimal indirect effect to sensitive animal species because the project is widening an existing freeway.

Caltrans has coordinated with NMFS regarding steelhead trout. An informal Section 7 consultation was concluded on May 16, 2013. Caltrans has also coordinated with the USFWS and a Biological Opinion was issued on December 12, 2012 for the Preferred Alternative.

As noted above, project enhancement and mitigation, including the advanced timing of some of these efforts as detailed in the REMP, would address habitat needs of listed species; achieving the overall goal of enhancing biodiversity and habitat value throughout the corridor.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect threatened and endangered species, please see Section 3.21 of this Final EIR/EIS.

ES.5.22 INVASIVE SPECIES

Invasive species such as pampas grass, ice plant, African fountain grass, African veldt grass, and onion weed already exist on the slopes along I-5. Tamarisk, arundo, castor bean, and fennel are common invasive species in the wetland habitats within the corridor. Construction of any of the build alternatives could result in the spread of exotic species, but the project also would provide an opportunity to control some of the invasive species through eradication and revegetation.

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. Through careful handling of the soil and equipment that works the soil, the invasive plants currently within the impact area can be removed. Revegetation of the slopes would require maintenance to keep the weed species from reinvading the new slopes. Partnerships may be formed with the lagoon foundations and landowners to simultaneously work to eradicate similar invasive species outside of the impact areas.

With regard to planting implemented as part of the project landscape plan, only native species are currently proposed. No invasive species would be installed.

If you are interested in reading more about how the I-5 NCC Project alternatives would affect invasive species, please see Section 3.22 of this Final EIR/EIS.

ES.5.23 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Any of the build alternatives would result in similar effects related to attainment of short-term and long-term transportation and economic objectives at the expense of some social, aesthetic, biological, noise, and other, land use impacts. Overall, short-term losses such as traffic delays or detours, and businesses affected by relocation; and long-term losses due to residential relocations, permanent visual impacts, and consumption of fuel and construction materials; would be balanced by short-term benefits from increased construction jobs and revenue and long-term enhancement of productivity for the local area, San Diego region, and the State. The planned preservation and restoration of several biological resources are anticipated to give ecological lift to the entire lagoon system within the North Coast Corridor. In addition, regional and community enhancement opportunities for pedestrian and bike trail amenities would improve community cohesiveness.

If you are interested in reading more about how the I-5 NCC Project alternatives would balance short- versus long-term productivity in the North Coast Corridor, please see Section 3.23 of this Final EIR/EIS.

ES.5.24 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Any of the proposed build alternatives would involve irreversible commitments of natural, physical, human, and fiscal resources, including land, fossil fuels, labor, cement, aggregate, State and federal funds, and resources for maintenance. If a greater need arises for the land, or if I-5 is no longer needed, the land could be converted to another use.

The commitment of these resources is based on the concept that residents in the immediate area, region, and State would benefit from the improved quality of the transportation system. These benefits would consist of improved accessibility and safety, which are expected to outweigh the commitment of resources.

If you are interested in reading more about how the I-5 NCC Project alternatives would have irreversible or irretrievable effects, please see Section 3.24 of this Final EIR/EIS.

ES.5.25 CUMULATIVE IMPACTS

Cumulative impacts (both direct and indirect) were identified by considering the impacts of the

I-5 NCC Project and other current or proposed actions in the area to establish whether, in the aggregate, they could result in cumulative adverse environmental impacts.

After analysis of resource health or status for each environmental topic addressed in this EIR/EIS, and review of the level of project contributions to cumulative impacts, the *I-5 NCC Project* was determined to make a cumulatively considerable contribution to cumulative impacts to visual/aesthetic resources, natural communities, and wetlands and other waters. For all other issues, the proposed project's incremental effects would not be cumulatively considerable, even though some resources were evaluated as having declining health or status.

For visual/aesthetic resources, natural communities, and wetlands issues, information on past, present, and reasonably foreseeable future projects was gathered from CEQAnet (updated in January 2013), and a detailed analysis of impacts that could occur for these three *I-5 NCC Project* issues in combination with the other projects was conducted.

The detailed cumulative analysis concluded that changes to the visual resources of the area would constitute cumulatively considerable contributions to cumulative visual/aesthetics impacts along I-5 right-of-way. Cumulative impacts to natural communities, wetlands and other waters were concluded to be adequately mitigated by implementation of the REMP (and for all the North Coast Corridor transportation projects in the PWP/TREP [EIR/EIS Appendix R], which would provide overall ecological "lift" throughout the region). Accounting for implementation of the regional REMP program over the entire project, the project's incremental impacts to these biological resources would be reduced to a less than cumulatively considerable contribution. Even with full implementation of the visual mitigation assumed through the project Design Guidelines and ECR, cumulative visual/aesthetics impacts would not be fully mitigated.

If you are interested in reading more about the cumulative impacts of the I-5 NCC Project alternatives please see Section 3.25 of this Final EIR/EIS.

ES.6 SUMMARY OF SIGNIFICANT IMPACTS UNDER CEQA AFTER MITIGATION

As summarized above and discussed in *Chapter 4*, permanent visual impacts of the build alternatives were determined to be significant, adverse, and unavoidable after implementation of the identified avoidance, minimization, and mitigation measures, as well as the project design features for all build alternatives.

Removal of a 47-unit multi-family residential structure in the City of Carlsbad was also found to result in a geographically focused significant impact to community cohesion under the 10+4 Barrier alternative. The residents of this structure demonstrate traits of elevated community cohesion in that there are a relatively high concentration of linguistically isolated Spanish-speaking households, as well as a high proportion of minority populations. As discussed in *Section 3.4*, displaced residents living in these 47 units may be difficult to relocate within a similar community as the availability of apartments within Carlsbad with similar rental rates is not adequate. If relocation is not feasible in Carlsbad and up to 47 families are relocated outside of the community, this may adversely impact community cohesion in the area, which would be considered a significant impact of the 10+4 Barrier alternative.

At the project level, for the 27-mile corridor, noise impacts are not identified as significant under CEQA. As discussed in *Chapter 4,* however, two segments and 58 individual receptors within the *I-5 NCC Project* area could experience potentially significant noise impacts under CEQA. The project includes soundwalls for a number of noise receptors (see *Section 3.15*) that are not required

under a CEQA analysis, and noise attenuation has been incorporated into the project in a number of locations. This attenuation would provide effective noise mitigation for a large number of locations and receptors along the *I-5 NCC Project*. Regardless of the project evaluation, soundwalls proposed outside of Caltrans right-of-way are subject to the approval of the property owner.

Each of the impacts identified as significant under CEQA (visual/aesthetics and community cohesion under the 10+4 Barrier alternative) as well as those that are potentially significant (isolated noise impacts within the 27-mile corridor), are addressed in the CEQA Findings prepared in accordance with Public Resources Code Sections 21002, 21002.1, and 21081, as well as CEQA Guidelines Section 15091. Where CEQA-significant impacts have been identified that would not receive mitigation lowering the impact to less than significant levels; there are specific economic, legal, social, technological or other benefits of the project which outweigh the potentially significant effects. Similarly, in order to approve a build alternative, decision makers would also consider a Statement of Overriding Considerations, that explains the benefits that override the significant and unmitigated impacts (CEQA Guidelines Section 15093).

The remaining impacts of the build alternatives were determined to be either not significant due to a less than significant change from existing conditions, or would be avoided or reduced to below a level of significance based on implementation of the project avoidance, minimization, and mitigation measures and project design features, as described in detail in *Chapters 3* and *4* of this Final EIR/EIS and the project ECR.

ES.7 AREAS OF INTEREST

Based on input during public scoping, and circulation of both the Draft EIR/EIS and Supplemental Draft EIR/EIS, as well as public outreach efforts, the following areas of public interest have been identified which can be considered controversial.

- Air Quality/Climate Change: Air quality and greenhouse gases continue to be controversial public issues given public awareness of existing conditions. Transportation-related pollutants would be reduced from existing conditions with implementation of any of the build alternatives. Please see *Section 3.14* of this Final EIR/EIS.
- Noise: All of the build alternatives would result in noise impacts to sensitive receptors along the I-5 corridor. In general, the corridor is very noisy and will remain so. The majority of projected increases in noise (93 percent) would be no more than 3 dBA over no build conditions. A 3 dBA increase generally is not audible to the normal, healthy, human ear. Another (over) five percent of receptors would receive some sort of attenuation (soundwall or architectural modification). Less than two percent of modeled receptors would be able to hear an increase in future noise levels associated with I-5 but would not receive attenuation. Please see *Sections 3.15* and *4.3.4* of this Final EIR/EIS.
- Acquisition of Private Property/Displacements: Although design of the build alternatives has been refined to minimize the need to acquire private property for the project, acquisition of property and displacement of existing residences and businesses may be controversial. Please see *Section 3.4* of this Final EIR/EIS.
- Biological Resources: Effects to area lagoons continue to be controversial public issues given their sensitivity and acknowledged rarity. Caltrans and SANDAG worked closely with State and federal resource agencies to develop the compensatory mitigation program proposed as part of the project. Implementation of that program would result in regional beneficial ecological lift. Please see *Sections 3.17* through *3.22* of this Final EIR/EIS.

ES.8 COORDINATION WITH PUBLIC AND OTHER AGENCIES

ES.8.1 GENERAL AND PUBLIC COORDINATION

Early and continuing coordination between the general public and public agencies has been, and continues to be, an essential part of the environmental process. It began during determination of the scope of environmental documentation, the level of analysis, identification of potential impacts, minimization and mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including: scoping meetings and other outreach, project development team meetings, interagency coordination meetings, and community meetings. Some specifics are summarized below.

Caltrans and FHWA held preliminary public scoping meetings before circulating a Notice of Intent (NOI) on January 12, 2004 and a Notice of Preparation (NOP) on October 20, 2004. Additional project outreach occurred through two separate newsletters sent out/or made available to addresses within one mile east or west of the freeway. Also, project information was available on the project web site at www.keepsandiegomoving.com. Since 2004, Caltrans staff and Caltrans staff on behalf of FHWA have: attended meetings; conducted surveys; circulated handouts/mailers; and given presentations to local communities and planning groups, homeowners associations, chambers of commerce, city councils, and local politician-sponsored meetings; all in an effort to update interested parties and the public on the status of the project. These meetings have facilitated substantial public input into the development and design of the proposed project.

ES.8.2 FOCUSED AGENCY COORDINATION

An I-5 North Coast Corridor Project Development Team (PDT) was assembled by Caltrans and FHWA in 2000 to serve as the technical advisory committee and internal decision-making body for the project. The PDT consists of Caltrans staff, Caltrans staff acting on behalf of FHWA, and representatives from other public agencies. The PDT met (and continues to meet) monthly during the course of project development as issues arise requiring technical direction or resolution.

Considerable coordination has occurred with the resource and regulatory agencies throughout the environmental review process, consistent with the NEPA/404 MOU for interagency coordination. Caltrans and FHWA have worked closely with representatives of the following public agencies to provide for timelier decision-making while improving the overall quality of those decisions. The regulatory agencies include the: USEPA, USFWS, USACE, U.S. Coast Guard, NOAA/NMFS, CDFW, RWQCB, and CCC. Additional coordination has occurred with the SHPO; Native American Tribes; the Native American Heritage Commission (NAHC); Camp Pendleton; and the Cities of San Diego, Del Mar, Solana Beach, Encinitas, Carlsbad, and Oceanside.

On December 10, 2004, Caltrans and FHWA signed an interagency MOU committing to integrate NEPA and Section 404 of the CWA in transportation planning, programming, and implementation stages for federal aid surface transportation projects requiring a permit under Section 404. Under the MOU process, signatory agencies, which include FHWA, USFWS, NOAA/NMFS, USACE, and the USEPA, were asked to concur on the following two milestones: (1) the project's purpose and need statement; and (2) the identification of a reasonable range of alternatives and the consideration of the criteria used to select and analyze the range of alternatives to be studied in the EIR/EIS. Concurrence on the Preliminary LEDPA Determination and Conceptual Mitigation Plan,

leading to identification of the preferred alternative, was completed in 2013.

Specific to lagoon coordination, one of the elements common to all of the build alternatives involves redesigning and modifying the lagoon bridges within the I-5 corridor. As part of this process, coordination efforts related to lagoon studies and resolution of project-related issues were conducted after release of the Draft EIR/EIS, with the result evaluated in the August 2012 Supplemental Draft EIR/EIS and incorporated into this Final EIR/EIS. The noted 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 CWA Section 404 integration process agency coordination and is 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, to address project status, and to obtain specific input on issues under their purview.

If you are interested in reading more about the coordination completed as part of I-5 NCC Project to fully identify and resolve project-related issues, please see Chapter 5 of this Final EIR/EIS.

ES.9 COASTAL CONSIDERATIONS

Because the majority of the transportation, community, and resource enhancement improvements associated with the project are located within the California Coastal Zone, they are subject to the coastal resource protection policies of the Coastal Act or, as applicable to the highway and community enhancement projects, the certified LCPs of the corridor cities. They are also subject to conformance with the afore-mentioned related federal CZMA.

SANDAG and Caltrans have prepared the North Coast Corridor PWP/TREP to plan for and implement a series of transportation, community and resource enhancement projects in a comprehensive and coordinated manner to meet the region's mobility vision while ensuring compliance with the California Coastal Act and the federal CZMA.

The PWP/TREP evaluates the North Coast Corridor as a whole, and incorporates all of the individual projects being pursued by transportation agencies into an integrated regional vision. The PWP/TREP describes I-5, LOSSAN, and community and regional enhancement improvements, It provides the framework for coordination of the rail, highway, and community and mitigation plans to ensure that improvements are appropriately phased, and that mitigation occurs in coordination with, or in advance of, 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 *Section ES.5.17,* above). The PWP/TREP program would allow for substantial net benefits to numerous critical policies as defined in the Coastal Act—benefits which would not be feasible absent the overall program. 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. This also provides for dispute resolution.

This approach is also consistent with the Environmental Mitigation Program (EMP), which was created as part of the San Diego County TransNet Extension Ordinance. The EMP is intended to help fill the mitigation needs resulting from the region'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.

If you are interested in reading more about the PWP/TREP, please refer to Chapter 2 of this Final EIR/EIS as well as www.keepsandiegomoving.com, under the I-5 Express Lanes Project.

ES.10 PERMITS

Permits will be required from a number of federal, State, and local agencies, as shown on *Table ES.19, Permits and Approvals Needed*. Each of the permits has been the subject of ongoing coordination with the permitting agency and is currently pending.

Table ES.1. Common Design Elements of the Build Alternatives

Separate HOV/Managed Lanes from general purpose lanes from near La Jolla Village Drive to Del Mar Heights Road, and from SR-78 to near Harbor Drive/Vandegrift Boulevard by a buffer varying in width up to five feet.
Construct one HOV/Managed Lane in each direction from La Jolla Village Drive to just north of Lomas Santa Fe Drive.
Provide a continuous HOV lane 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 HOV/Managed Lanes to the existing HOV lanes just north of that merge.
Construct two HOV/Managed Lanes in each direction from just north of Lomas Santa Fe Drive to Harbor Drive/Vandegrift Boulevard.
Construct 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. The proposed DAR at Manchester Avenue has been redesigned since circulation of the Draft EIR/EIS to minimize environmental impacts. Voigt Drive and Campus Point Drive would be modified to accommodate the proposed Voigt DAR traffic and would not preclude proposed light rail transit.
Construct Intermediate Access Points (IAPs) or at-grade access 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.
Provide 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).
Construct 12-ft-wide auxiliary lanes as needed in 19 locations (including 6 southbound, 5 northbound and 8 both north- and southbound), and 10- to 12-ft-wide shoulders.
Construct the San Elijo Multi-use Facility at Manchester Avenue, a new park and ride facility at SR-76, and enhanced park and ride facilities at other locations.
Revise various local interchanges to improve vehicular, pedestrian, and bicycle circulation at the following locations: northbound ramp for California Street; southbound ramps for Cassidy Street; and both north- and southbound ramps for La Jolla Village Drive, Genesee Avenue, Roselle Street, Carmel Valley Road, Del Mar Heights Road, Via de la Valle, Lomas Santa Fe Drive, Manchester Avenue, Birmingham Drive, Santa Fe Drive, Encinitas Boulevard, Leucadia Boulevard, La Costa Avenue, Poinsettia Lane, Palomar Airport Road, Cannon Road, Tamarack Avenue, Carlsbad Village Drive, Las Flores Drive, SR-78, Oceanside Boulevard, Mission Avenue, SR-76, and Harbor Drive.
Revise local street and highway crossings where new bridges are proposed to improve sidewalks, lighting, landscaping, and enhanced retaining walls.
Provide new and/or wider bridges at Soledad Canyon Creek, Los Peñasquitos Creek, Carmel Creek, Loma Alta Creek, San Dieguito River, San Luis Rey River, and Sorrento Valley; and at San Dieguito, San Elijo, Batiquitos, Agua Hedionda, and Buena Vista Lagoons, with the San Elijo, Batiquitos, and Buena Vista bridges also to be lengthened.
Provide improvements to storm water facilities at Encinas Creek.
Include interpretative elements in an overlook area for the San Elijo Lagoon.
Construct 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, at specific locations, and as needed, along the I-5 corridor.
Abandon or improve project-related drainage facilities, including extensions, replacements or linings, with new drainage facilities constructed adjacent to cross roads (facility examples include storm drain inlets, storm ditches, rock slope protection, and headwalls).
Install ramp metering at various on-ramps (with ultimate metering at all 58 on-ramps at buildout).
Relocate various existing overhead or underground utilities (water, sewer, gas, electric, telephone, and other communications) as needed and within existing utility easements, as possible.
Construct proposed soundwalls as described in *Section 3.15, Noise*, of this document, with specifics dependent on final design.
Construct regional and community enhancement features.

Table ES.2: Direct Access Ramps Information

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. <u>Advantages of DAR to and from Voigt Drive:</u> • 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 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 <u>NB DAR:</u> • 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 <u>SB DAR:</u> • 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:*** • 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 ➢ 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 ES.2 (cont.): Direct Access Ramps Information

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 USACE 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 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 REMP
MANCHESTER AVENUE DAR (includes the San Elijo Multi-use Facility)			
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 min 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 San Elijo Multi-use Facility 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 ES.2 (cont.): Direct Access Ramps Information

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
MANCHESTER AVENUE DAR (includes the San Elijo Multi-use Facility) (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. <u>Advantages of DAR to and from Manchester Avenue:</u> • Access to proposed San Elijo Multi-use Facility • Improved coastal access • Supports and facilitates future BRT along I-5 • Supports HOV/Managed Lanes • Access to Mira Costa College (San Elijo Campus) • High HOV potential utilization on El Camino Real (serving eastern Encinitas)	***Land Use:*** <u>San Elijo Multi-use Facility:</u> • Area (excluding bus facility) would be 21.67 acres • Due to irregular shape of facility, 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 staging area for recreational users, including bike lockers and solar electric charging stations for electric vehicles • 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 multi-use 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 San Elijo Multi-use Facility 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 the Laser mitigation site and/or Batiquitos Bluffs and through other enhancements identified in the REMP • Impacts to wetlands would be mitigated for no net loss at the San Dieguito W19 Mitigation Site and through other enhancements identified in the REMP • Only plant species native to the local area 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, as appropriate • Landscape vegetation height would be appropriate for nearby sensitive species

Table ES.2 (cont.): Direct Access Ramps Information

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
MANCHESTER AVENUE DAR (includes the San Elijo Multi-use Facility) (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 USACE 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 San Elijo Multi-use Facility is located in agricultural lands, developed and ornamental habitat, and would not directly impact any biological resources		

Table ES.3: Braided Ramps Information

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 exceed capacity 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 <u>NB I-5 Braided Ramps:</u> • Six parcels/properties would require partial acquisition (approximately 9.13 acres) • Total length of braided ramps - approximately 4718 feet <u>SB I-5 Braided Ramps:</u> • 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 USACE 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 REMP

Table ES.4: Auxiliary Lanes Information

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 the 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 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	***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 • These avoidance/minimization measures apply to all auxiliary lanes	***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 ES.4 (cont.): Auxiliary Lanes Information

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.)			
	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 • ***Biological Resources:*** • No biological impacts	***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" criteria under the Caltrans Traffic Noise Analysis Protocol; however, S602 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 ES.4 (cont.): Auxiliary Lanes Information

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" 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" 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 at the Deer Canyon II, Batiquitos Bluffs, and/or Laser mitigation sites • Additional enhancements are identified in the REMP
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:*** • Soundwalls S652, S653 and S654 Option 1, S654 Option 2, and S658 were evaluated. They do not meet "reasonable" criteria under the Caltrans Traffic Noise Analysis Protocol, and are not recommended. S654 Option 2 and S658, however, are recommended for severely impacted receptors. ***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 at Deer Canyon II • Additional enhancements are identified in the REMP

Table ES.4 (cont.): Auxiliary Lanes Information

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" 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 USACE/State wetland (filled), and 0.03 acre of USACE/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 REMP
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 (Encina 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:*** • Two Soundwalls, S810 and S811, were evaluated for this segment and found to be reasonable. Therefore they are recommended	***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 REMP

Table ES.5: 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 Canyon Creek, and Carmel Creek)** ***Assumes no new I-5 crossings**	Los Peñasquitos Creek: multiple existing facilities and roadways Soledad Canyon Creek: multiple existing facilities and roadways Carmel Creek: 421 ft long 179-209 ft wide	Los Peñasquitos Creek has existing rip rap; Canyon 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 Canyon 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 2520 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 (refined 8+4 Buffer-Preferred Alternative) ***Carmel Creek I-5 Bridge widening 9 - 16 ft wider to west on south bound lanes**	**421 ft long 188 - 225 ft wide**	**Channel width: ~415 ft** **Channel bottom: Varies** **Riprap or armoring on southern abutment only, 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 ES.5 (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. <u>Del Mar LCP Goals</u> -Develop pedestrian trails and bike paths -Ensure protection of wetlands and ESHA <u>Restoration Efforts</u> -Dredging/sedimentation control -Reduce urban/landscape runoff -Maintain tidal influence at lagoon mouth -Control/remove invasive plant species <u>Monitoring/Management</u> -Annual maintenance dredging	**Proposed I-5 Bridge 2 Sorrento Valley Road Bike Bridge (refined 8+4 Buffer-Preferred Alternative)** ***Carmel Creek culvert replaced with bridge**	**443 ft long 15 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 established 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** **Establishment 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 (refined 8+4 Buffer-Preferred Alternative) ***HOV connector bridge over Soledad Canyon and Los Peñasquitos creeks**	**3376 ft long 60 ft wide over Los Peñasquitos Creek** **863 ft long 60 ft wide over Soledad Canyon Creek**	**New bridge over Los Peñasquitos Creek and Soledad Canyon 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; 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 Canyon 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 Canyon 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 ES.6: 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 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 (refined 8+4 Buffer-Preferred Alternative) ***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 or channel bottom.**	**2.94/3.64 ac add'l roadbed fill in USACE WUS/State wetland 0.42/0.75 add'l shaded USACE 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 ES.6 (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 establishment of new intertidal wetlands; lowering of floodplain elevation -Development of native upland habitat/bird nesting areas -Establishment 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 roadbed 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 establishment, 78.6 ac of coastal sage scrub establishment, 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 ES.7: 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 176 - 188 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 USACE/State waters/ wetland 0.54 add'l shaded USACE/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 farther 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 ES.7 (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 (refined 8+4 Buffer-Preferred Alternative)**	**560 ft long 303-388 ft wide**	**All Alts = Channel bottom width: 261 ft Channel depth: -6.0 to -6.5 ft NGVD Channel slope: 2:1 (riprap)**	**0.60/0.09 ac net established USACE/State waters/wetland from wider bridge 1.4 add'l shaded USACE/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 farther 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 ES.7 (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 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 ES.8: 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]
<u>Concerns</u> -Increased sedimentation/siltation -Excessive nutrient loads from agricultural land uses -Invasive plant species <u>Special Status Wildlife Species</u> -Western snowy plover -Belding's savannah sparrow -California gnatcatcher -California least tern -Light-footed clapper rail -Tidewater goby <u>Constraints</u> -Railroad bridge crossing -Carlsbad Boulevard/Highway 101 crossing -Buried utilities/infrastructure <u>Carlsbad LCP Goals</u> -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 <u>Restoration Efforts</u> -Maintain tidal inlet/tidal flows -Remove excess sediment -Bird nesting habitat/deep water fish habitat <u>Monitoring/Management</u> -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 USACE WUS/ State wetland 0.28 ac add'l shaded USACE 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 ES.8 (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 (refined 8+4 Buffer-) ***Staging with existing HOV**	282 ft long, two bridges each 101 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 USACE/State wetland 0.56 ac add'l shaded USACE/ State wetland	Maximum tidal range in east basin: 7.35ft Maximum phase lag: TBD Maximum residence time: 5.4 days in east basin	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 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 (refined 8+4 Buffer – Preferred Alternative) ***Staging without existing HOV**	**282 ft long, two bridges each 101 ft wide with 19.2 ft gap**	**Channel bottom width: 183.5 ft** **Channel depth: -7 ft NGVD** **Channel slope: 2:1 (riprap)**	**3.13/3.62 ac net additional road bed fill of USACE/ State wetland** **0.37 ac add'l shaded USACE/ State wetland**	**Maximum tidal range in east basin: 7.35 ft** **Maximum phase lag: TBD** **Maximum residence time: 5.4 days east basin**	**Additional ~13.5+ 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 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 ES.8 (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	Establishes +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 establishment 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 ES.9: 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
<u>Concerns</u> -Impaired Waterbody -Indicator Bacteria -Sedimentation Siltation -Acoustic impacts from pile driving (during bridge footing construction) on both avian and fish species <u>Special Status Species</u> -Belding's savannah sparrow -California gnatcatcher -Light-footed clapper rail -Tidewater goby surveys are recommended by USFWS -Wandering skipper surveys are recommended by USFWS <u>Constraints</u> -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 <u>LCP Goals</u> -Wetland Acquisition/Restoration -Preserve Coastal Sage Scrub habitat -Preserve California gnatcatcher habitat -Maintain/Expand Recreational Uses <u>Restoration Efforts</u> -Dredging and Eelgrass Planting -Removal of Toxic Algae/Caulerpa (complete) -Hallmark Sites Planning/Preservation <u>Monitoring/Management</u> -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 (refined 8+4 Buffer-Preferred Alternative)	**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)**	**3.56/3.77 ac add'l roadbed fill in USACE waters/State wetlands 0.37 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 ES.9 (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	Establishes 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 establishment 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 established 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 establishment, 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 ES.10: 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
<u>Concerns</u> -Sedimentation/Siltation -Sensitive bird species/island maintenance <u>Special Status Species</u> -Belding's savannah sparrow -California gnatcatcher -Light-footed clapper rail <u>Constraints</u> -Concrete weir at Lagoon mouth -Railroad Bridge Crossing -Carlsbad Boulevard/Coast Highway Crossing -Buried Infrastructure <u>LCP Goals</u> -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 CDFW approved restoration <u>Restoration Efforts</u> -Dredging/sedimentation control -Native vegetation restoration <u>Monitoring/Management</u> -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 USACE 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 USACE WUS/ State wetland 0.15 ac additional shaded USACE 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 farther 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 ES.10 (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 USACE WUS/State wetland 0.39 ac additional shaded USACE WUS/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 farther 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 (refined 8+4 Buffer-Preferred Alternative) Optimized Bridge w/existing HOV	**197 ft long 310 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)**	**0.81/1.14 ac net add'l roadbed fill in USACE WUS/State wetland 0.45/0.48 ac add'l shaded USACE WUS/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 farther 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 ES.10 (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.

Table ES.12: North Coast Bike Trail Information

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
NORTH COAST BIKE TRAIL GENERAL INFORMATION			
The North Coast Bike Trail (NC Bike Trail) is proposed to extend from Gilman Drive in the City of San Diego, to Harbor Drive in the City of Oceanside (*27 miles*). To facilitate the NC Bike Trail, 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. Bike Trail 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, 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. EIR/EIS *Figures 2-3.4a* through *2-3.4j* depict the proposed route. Descriptions of the NC Bike Trail 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 • 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 • 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 • Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events. • Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails as applicable, consistent with current lagoon practices • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife	None required for most segments. Exceptions discussed below for San Diego and Solana Beach
NC BIKE TRAIL 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 Drive 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 Bike Trail 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 USACE 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 REMP

Table ES.12 (cont.): North Coast Bike Trail Information

FEATURE JUSTIFICATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
NC BIKE TRAIL IN SOLANA BEACH			
The NC Bike Trail 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 Bike Trail 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 *Tables ES.12* and *ES.13*)	See description under General Information, above, for information about avoidance and minimization strategies	Mitigation would consist of restoration at Deer Canyon II as described for Solana Beach 2 on *Tables ES.12* and *ES.13*
NC BIKE TRAIL IN ENCINITAS			
The NC Bike Trail would provide enhancements to current bicycle facilities and create new community connections that currently do not exist. In the City of Encinitas, the NC Bike Trail 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 Bike Trail 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 Boulevard, along the bike/pedestrian bridge at Union Street, and from Orpheus Avenue to La Costa Avenue. At La Costa Avenue, the NC Bike Trail 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 BIKE TRAIL IN CARLSBAD			
The NC Bike Trail would provide enhancements to current bicycle facilities and create new community connections that currently do not exist. In the City of Carlsbad, the NC Bike Trail 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 Bike Trail 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 BIKE TRAIL IN OCEANSIDE			
The NC Bike Trail would provide enhancements to current bicycle facilities and create new community connections that currently do not exist. The NC Bike Trail 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 ES.13: Community Enhancements Information

FEATURE	DESCRIPTION/LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
SAN DIEGO				
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 a segment of the proposed North Coast (NC) Bike Trail. See Table ES.12*	***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 Road 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 • Only plant species native to the local area would be used for disturbed areas • Removal of accumulated sediment under the bridge would enhance Los Peñasquitos Lagoon flows • Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events. • Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails as applicable, consistent with current lagoon practices • Unobtrusive path lighting would be provided for safety and 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 maintaining existing eight parking spaces (area of 112,978 sq ft); 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 ***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	• Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events. • Concurrent construction with I-5, minimizing potential community disruption • Only plant species native to the local area would be used to create a visual buffer between the trail and the parking area. Torrey pines would be salvaged and replanted as appropriate • Impacts avoided by reconfiguring and restoring an existing park and ride lot	None required
2c - Old Sorrento Valley Road Bicycle/Pedestrian Enhanced Trail Connections from Carmel Mountain Road to Carmel Valley 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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 • Only plant species native to the local area would be used for any project-related planting • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife • Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events. • Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails as applicable, consistent with current lagoon practices	

Table ES.13 (cont.): Community Enhancements Information

FEATURE	DESCRIPTION/LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
SAN DIEGO (cont.)				
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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 • Only plant species native to the local area would be used for any project-related planting • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife • Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events. • Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails, as applicable, consistent with current lagoon practices	None required
4 - Pedestrian Overpass Connection to 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 Bike Trail 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 Bike Trail in the City of San Diego	See information about Regional Enhancements on *Table ES.12*			

Table ES.13 (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 proposed retaining wall along this section of the existing freeway would provide extra area for streetscape improvements and minimize visual impacts • Only plant species native to the local area would be used on slopes to screen the proposed retaining wall and reduce visual impacts • 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 maintaining existing eight parking spaces (area of 29,612 sq ft), 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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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	• Use of an existing trail head minimizes impacts to sensitive habitat over construction at a new location • Only plant species native to the local area would be used on slopes to screen the proposed retaining wall and reduce visual impacts • Only plant species native to the local area would be used for any project-related planting • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate • 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 Deer Canyon II
3 - NC Bike Trail in the City of Solana Beach	See information about Regional Enhancements on *Table ES.12*			

Table ES.13 (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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 • Concurrent construction with I-5, minimizing potential community disruption • 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 • Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events. • Trail lighting would be provided along Manchester Avenue and on the suspended bridge if compatible with sensitive resources. • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate	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 maintaining the existing 32 parking spaces plus 4 motorcycle spaces and adding 1 vehicle parking space (area of 29,612 sq ft), 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	• Concurrent construction with I-5, minimizing potential community disruption • Only plant species native to the local area would be used for any project-related planting	None required

Table ES.13 (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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 • Only plant species native to the local area would be used for any project-related planting	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 • Only plant species native to the local area would be used for any project-related planting	None required

Table ES.13 (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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 • Only plant species native to the local area would be used for disturbed areas • A bridge is proposed to span across the wetland and avoid impacts	None required
5b - 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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 only plant species native to the local area would be used for revegetation	Impacts to wetland habitats would be mitigated for no net loss at the San Dieguito W19 Mitigation Site

Table ES.13 (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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 • Only plant species native to the local area would be used for any project-related planting	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 • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife	None required
7 - NC Bike Trail in the City of Encinitas	See information about Regional Enhancements on *Table ES.12*			

Table ES.13 (cont.): Community Enhancements Information

FEATURE	DESCRIPTION/LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
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 Encinas. Also, a bridge crossing is proposed under I-5 to lagoon trails on the east side, and connecting north and south sides of the lagoon (*1.18 miles long, 12 feet wide*) *Additionally, this is a segment of the proposed NC Bike Trail. See Table ES.12*	***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 • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate • Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails as applicable, consistent with current lagoon practices • Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.	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 • Only plant species native to the local area would be used for any project-related planting • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate • Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails as applicable, consistent with current lagoon practices • Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events.	None required
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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 would restrict impact footprint • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate	None required

Table ES.13 (cont.): Community Enhancements Information

FEATURE	DESCRIPTION/LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
CARLSBAD (cont.)				
5 – Streetscape Enhancements on Chestnut Avenue	Proposed pedestrian streetscape enhancements along corridor of Chestnut Avenue (between Holiday Park, and Chase Field and Brierly Field) to link Holiday Park with the residential community on the west side of I-5. Includes new paving and planted areas, sidewalks, lighting under the new bridge, landscaping, and enhanced retaining walls.	***Land Use:*** • No land acquisition required ***Community:*** • Provides residents separate pedestrian route along Chestnut Avenue linking Holiday Park ***Traffic/Transportation/Pedestrian/Bicycle Facilities:*** • Provides residents separate pedestrian route along Chestnut Avenue linking to Holiday Park ***Visual/Aesthetics:*** • Improves visual character and quality through the construction of an aesthetically pleasing pedestrian space • Provides visual enhancements on the Chestnut Avenue Undercrossing ***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 - NC Bike Trail in the City of Carlsbad	See information about Regional Enhancements on *Table ES.12*			
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 ES.13 (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 • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife • Shrubs to help screen and enhance the Sprinter tracks to match proposed landscaping to the east (by City of Oceanside) to reduce visual impacts • Only plant species native to the local area would be used for any project-related planting	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 • Container tree and shrub planting on the bridge and enhanced pedestrian paving on the bridge and along Division Street to reduce visual impacts • Only plant species native to the local area would be used for any project-related planting	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 ES.13 (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 with 51 parking spaces (area of 40,605 sq ft), 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 ***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	• 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 • Only plant species native to the local area would be used for any project-related planting • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife • Any lighting would have shielding and be directed away from sensitive habitat. In addition, lighting would be equipped to prevent perching by birds, as appropriate • Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails as applicable, consistent with current lagoon practices	None required

Table ES.13 (cont.): Community Enhancements Information

FEATURE	DESCRIPTION/LOCATION	IMPACTS/BENEFITS	AVOIDANCE/MINIMIZATION	MITIGATION
OCEANSIDE (cont.)				
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 farther from sensitive habitats and species • Unobtrusive path lighting would be provided for safety and to avoid potential impacts to wildlife • Signs would identify sensitive habitat and describe prohibitions regarding night use and pets on trails consistent with current lagoon practices • Fencing would prevent trail users from accessing sensitive habitat. Fencing material and design would be chosen to accommodate nighttime wildlife movement and flood events. • Only plant species native to the local area would be used for any project-related planting	None required
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 a segment of the proposed NC Bike Trail. See Table ES.12*	***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 Bike Trail in the City of Oceanside	See information about Regional Enhancements on *Table ES.12*			

Table ES.14: Summary of Potential Impacts by Alternative

Potential Impacts		Alternatives				
		10+4 Barrier	**10+4 Buffer**	**8+4 Barrier**	**8+4 Buffer (Preferred Alternative)**	**No Build**
HUMAN ENVIRONMENT						
Land Use	**Consistency with State, Regional and local Plans and Programs**	Minor inconsistencies with city and community plans				Consistent
	Coastal Zone	Consistent with PWP approval	Consistent with PWP approval	Consistent with PWP approval	Consistent with PWP approval	Consistent
Park and Recreational Facilities acres (ac) of impacts	**Public Parkland**	4.23 ac	2.48 ac	3.24 ac	1.94 ac	No Impacts
Growth		Planned growth accommodated	Planned growth accommodated	Planned growth accommodated	Planned growth accommodated	Planned growth not accommodated
Farmlands		27 ac	25 ac	26 ac	10.9 ac	None
Community	**Cohesion**	Impacts at one community	No Substantial Impacts	Impacts at one community	No Substantial Impacts	No Substantial Impacts
	Relocations	112 Residential Units and 13 Businesses	53 Residential Units and 10 Businesses	104 Residential Units and 11 Businesses	26 Residential Units and 10 Businesses	No Relocations
	Environmental Justice	Disproportionate impact	No disproportionate impact	No disproportionate impact	No disproportionate impact	No impact
Community Connectivity		Replacement of each I-5 overcrossing/undercrossing (OC/UC) would include improvements to bike lanes and sidewalks Community enhancements for: 9 pedestrian OCs/UCs; 11 trail connections; 5 trailhead and streetscape enhancements/street improvements; 1 multi-use facility, 2 park and ride facilities; and 3 parks				None
Traffic and Transportation Project Area Travel times (a.m./p.m.)		NB 25-27/30-36 min SB 28-35/26-30 min	NB 25-27/30-36 min SB 28-35/26-30 min	NB 27-29/45-50 min SB 36-47/29-30 min	NB 27-29/45-50 min SB 36-47/29-30 min	NB 29-37/67-69 min SB 53-54/40-48 min
Pedestrian and Bicycle Facilities		Circulation for pedestrians and bicyclists would improve and be similar for all build alternatives as the identified Enhancement opportunities would create connections, improve trailheads, and enhance existing facilities. Two of the existing OCs/UCs spanning I-5 would not be replaced as part of the build alternatives. Where new OCs/UCs are constructed, bike lanes and sidewalks would be added that would connect pedestrian and bicycle facilities currently constrained.				
Utilities and Emergency Services		No Substantial Impacts	No Substantial Impacts	No Substantial Impacts	No Substantial Impacts	None
Visual/Aesthetics		Visual character of the corridor would become substantially more urban. Visual quality would be lowered substantially.				None
Cultural Resources		No Adverse Effects to Known Potentially Eligible Sites	No Adverse Effects to Known Potentially Eligible Sites	No Adverse Effects to Known Potentially Eligible Sites	No Adverse Effects to Known Potentially Eligible Sites	No Effect
PHYSICAL ENVIRONMENT						
Hydrology/Drainage		Minor Impacts	Minor Impacts	Minor Impacts	Minor Impacts	None
Floodplain		Minor Encroachment	Minor Encroachment	Minor Encroachment	Minor Encroachment	None
Water Quality and Storm Water		Temporary Construction Impacts/Long-term Water Quality Benefits				No Improvements
Geology Soils/Seismic/Topography		Minor Impacts	Minor Impacts	Minor Impacts	Minor Impacts	None
Paleontology		Sediments of high, moderate, and low sensitivity	Sediments of high, moderate, and low sensitivity	Sediments of high, moderate, and low sensitivity	Sediments of high, moderate, and low sensitivity	No impact
Hazardous Waste/Materials		No substantial difference in impacts between alternatives regarding hazardous waste sites.				No Impact
Air Quality		No Exceedances	No Exceedances	No Exceedances	No Exceedances	No Exceedances
Noise		Not Substantial with abatement	Not Substantial with abatement	Not Substantial with abatement	Not Substantial with abatement	No Effect
Energy		No net increase in energy consumption, since energy used during construction and operation would be balanced against energy saved by relieving congestion and reducing out of direction travel. Specifically the build alternatives include additional auxiliary and HOV lanes, new and expanded park and ride facilities, improved bike lane and sidewalk features, and ramp metering. An improved transit-highway may likely improve traffic conditions.				Stop-and-go traffic conditions decrease fuel efficiency

Table ES.14 (cont.): Summary of Potential Impacts by Alternative

Potential Impacts		Alternatives				
		10+4 Barrier	**10+4 Buffer**	**8+4 Barrier**	**8+4 Buffer (Preferred Alternative)**	**No Build**
BIOLOGICAL ENVIRONMENT						
Permanent Impacts to Natural Communities	Sensitive Upland Habitat	69.43 ac	67.77 ac	68.35 ac	63.72 ac	No Impact
	Wetland Habitats	25.55 ac	21.49 ac	22.91 ac	18.44 ac	No Impact
	Eelgrass Habitat	0.24 ac	0.09 ac	0.22 ac	0.08 ac	No Impact
Net Permanent Impacts to Federal & State Waters	Permanent Impacts to USACE Jurisdictional Waters of the U.S. including wetlands	17.17 ac	14.16 ac	15.43 ac	11.61 ac	No Impact
	Permanent Impacts to CDFW and CCC Jurisdictional Waters including wetlands	23.03 ac	18.97 ac	20.39 ac	15.92 ac	No Impact
Permanent Impacts to Sensitive Plant Species	**Sensitive Plants**	Several individuals of sensitive plant species listed by the CNPS and/or federal or State species of concern would be impacted by each of the build alternatives, including: San Diego barrel cactus (*Ferocactus viridescens*), Del Mar sand aster (*Lessingia filaginifolia var. linifolia*), Nuttall's scrub oak (*Quercus dumosa* [Nutt.]), Orcutt's pincushion (*Chaenactis glabriuscula* DC var. *orcuttiana*), sea dahlia (*Coreopsis maritima* [Nutt.]), southern tarplant (*Centromadia parryi* spp. *australis*), Torrey pine (*Pinus torreyana* Carr. ssp. *torreyana*), and wart-stemmed ceanothus (*Ceanothus verrucosus* [Nutt.])				No Impact
Impacts to Sensitive Animal Species	**Sensitive Animals**	Identified within permanent and/or temporary impact areas to habitat for these species: San Diego horned lizard (*Phrynosoma coronatum blainvillei)*, Coronado Island skink (*Eumeces skiltonianus interparietalis)*, orange-throated whiptail (*Cnemidophorus hyperythrus)*, rufous-crowned sparrow (*Aimophila ruficeps canescens)*, raptors, loggerhead shrike (*Lanius ludovicianus)*, desert woodrat (*Neotoma lepida intermedia)*, and San Diego pocket mouse (*Perognathus fallax fallax),* least bittern (*Ixobrychus exilis*), wandering skipper butterfly (*Panoquina errans*) Potential to occur within permanently and/or temporarily impact habitats: coastal pelagic species (northern anchovy [*Engraulis mordax*], Pacific sardine [*Sardinops sagax*], Pacific mackerel [*Scomber japonicus*], and the jack mackerel [*Trachurus symmetricus*]). Potential indirect impacts to Pacific groundfish species.				No Impact
Permanent Impacts to Federal & State Threatened and Endangered Animal Species	Coastal California Gnatcatcher	12 to 15 territories	12 to 15 territories	12 to 15 territories	12 to 15 territories	No Impact
	Belding's Savannah Sparrow	Two territories	One territory	One territory	One territory	No Impact
	Light-Footed Clapper Rail	One pair, one territory	One pair	One pair, one territory	One Pair	No Impact
Permanent Impacts to Federal & State Threatened and Endangered Plant Species	Del Mar Manzanita	Six individual plants	Six individual plants	Six individual plants	Six individual plants	No Impact
Permanent Impacts to Federal & State Critical Habitat	Coastal California Gnatcatcher Habitat	37.3 ac	33.47 ac	34.28 ac	31.7 ac	No Impact
	Least Bell's Vireo and Southwestern Willow Flycatcher Habitat	0.03 ac	0.03 ac	0.03 ac	0.03 ac	No Impact
	Tidewater Goby Critical Habitat	500 ft^2	500 ft^2	500 ft^2	500 ft^2	No Impact
OTHER CONSIDERATIONS						
Post Mitigation CEQA Significance – Significant and Unmitigable		Visual/Aesthetics and removal of a 47-unit multi-family structure	Visual/Aesthetics	Visual/Aesthetics	Visual/Aesthetics	None
Right-of-Way Acquisition estimates		100 ac	70.53 ac	96 ac	60.5 ac	None
Total Cost		$4.495 Billion	$3.601 Billion	$4.121 Billion	$3.062 Billion	None

Table ES.15: Total Delay, Congested Hours, and Travel Time[9]

Conditions	Year	Direction	Vehicle Hours of Delay	Congested Hours AM	Congested Hours PM	Travel Time Min AM	Travel Time Min PM
Existing	2006	NB	3,500	0.0	5.0	24-25	33-39
	2006	SB	4,700	5.0	0.0	31-44	27-32
No Build	2030	NB	13,700	3.5	6.0	29-37	67-69
	2030	SB	14,000	6.0	7.0	53-54	40-48
10+4 Barrier/Buffer	2030	NB	600	0.0	2.5	25-27	30-36
	2030	SB	3,700	5.0	2.0	28-35	26-30
8+4 Barrier/Buffer	2030	NB	9,600	0.0	6.0	27-29	45-50
	2030	SB	8,000	5.5	2.0	36-47	29-30

Table ES.16: Northbound AM and PM Weekday Peak Period Congestion Duration[10]

Conditions	Year	AM Peak Hour			PM Peak Hour		
		Congestion		Duration (hrs)	Congestion		Duration (hrs)
		Begin	End		Begin	End	
Existing	2006	--	--	0	2:00	7:00	5
No Build	2030	7:30	11:00	3.5*	2:00	8:00	6
10+4 Barrier/Buffer	2030	-	--	0	4:00	6:30	2.5
8+4 Barrier/Buffer	2030	--	--	0	2:00	8:00	6

* Congestion would continue through the a.m. and p.m. hours.

Table ES.17: Southbound AM and PM Weekday Peak Period Congestion Duration[11]

Conditions	Year	AM Peak Hour			PM Peak Hour		
		Congestion		Duration (hrs)	Congestion		Duration (hrs)
		Begin	End		Begin	End	
Existing	2006	6:30	11:30	5	--	--	0
No Build	2030	6:00	12:00	6*	12:00	7:00	7
10+4 Barrier/Buffer	2030	7:00	12:00	5*	4:00	6:00	2**
8+4 Barrier/Buffer	2030	6:30	12:00	5.5*	4:00	6:00	2**

* Congestion would continue through the a.m. and p.m. hours.
** The p.m. peak hours are from 12:00 to 8:00.

9, 11, 12 The project team determined that the initial Series 10 2030 forecasted daily traffic demands, which were used as the basis of the original traffic studies, are generally equivalent to the Series 12 2035 forecast daily traffic volumes (within an average of 3.5 percent). These demand volume differences are considered minimal and updating the Series 10 travel forecasts to year 2035 at this time would not result in changes to the recommended geometric configurations of the project alternatives or alter the results of the associated studies. Therefore, travel volume forecasts and the associated technical studies presented in this Final EIR/EIS are based on the region's Series 10 travel forecast model and these analyses are considered representative of what is expected to occur within the 2040 to 2050 timeframe. Additional information is provided in *Section 3.6*.

Table ES.18a: Recommended Soundwalls

SOUNDWALL	LOCATION	STATION BEGIN	STATION END	APPROX. LENGTH ft	HEIGHT RANGE ft	DIRECTION
S602 Option 2	American Way or Via de la Valle	600+00	604+40	1503 ft	16 ft	NB(East)
S603A Option 1A	Via De La Valle	597+80	601+00	1086 ft	8-12 ft	SB (West)
S603B Option 1A	Via De La Valle	604+80	608+15	1109 ft	10 ft	SB (West)
S614	Lomas Santa Fe	614+33	615+80	499 ft	8-10 ft	NB (East)
S622 Option 2+	Manchester Avenue	619+20	621+ 75	896 ft	12-14 ft	NB (East)
S631	Manchester Avenue	630+90	632+25	758 ft	10-12 ft	SB (West)
S633	Manchester Avenue	631+66	634+10	837 ft	12 ft	SB (West)
S635	Manchester Avenue	634+00	634+97	322 ft	14 ft	SB (West)
S644+	Birmingham Drive	645+10	647+50	899 ft	10-16 ft	NB (East)
S646+	Birmingham Drive	645+10	647+50	899 ft	10-16 ft	NB (East)
S654 Option 2+	Birmingham Drive	652+98	653+34	187 ft	10 ft	NB (East)
S658+	Santa Fe Drive	656+30	662+15	2136 ft	8-12 ft	NB (East)
S671+	Requeza Street	669+84	672+15	860 ft	12-14 ft	SB (West)
S686A+	Encinitas Boulevard	685+29	685+88	361 ft	8 ft	NB (East)
S686B+	Encinitas Boulevard	684+90	685+82	341 ft	10 ft	NB (East)
S686C+	Encinitas Boulevard	685+88	686+28	164 ft	10 ft	NB (East)
S688+	Leucadia Boulevard (SI only)	686+94	687+4	276 ft	16 ft	NB (East)
S689+	Leucadia Boulevard	683+25	696+20	4259 ft	12-16 ft	SB (West)
S692+	Leucadia Boulevard	690+10	695+45	1778 ft	12-14 ft	NB (East)
S736	Poinsettia Lane	732+45	740+50	2910 ft	8-12 ft	NB (East)
S750+	Poinsettia Lane	742+95	757+45	4793 ft	12-16 ft	NB (East)
S798	Tamarack Avenue	798+00	800+00	663 ft	8-16 ft	NB (East)
S801	Tamarack Avenue	800+10	802+30	741 ft	8-10 ft	SB (West)
S802	Tamarack Avenue	800+10	801+75	538 ft	8 ft	NB (East)
S810	Tamarack Avenue	803+35	815+00	3829 ft	10-16 ft	NB (East)
S811	Tamarack Avenue	803+00	815+00	3937 ft	8-16 ft	SB (West)
S821	Carlsbad Village Drive	818+80	825+50	2218 ft	12-14 ft	SB (West)
S822+	Carlsbad Village Drive	818+25	823+50	2211 ft	14-16 ft	NB (East)
S826+	Las Flores Drive	824+75	826+05	433 ft	10 ft	NB (East)
S827+	Las Flores Drive	825+82	827+60	584 ft	16 ft	SB (West)
S835	SR-78 / I-5 Separation	834+50	837+60	1430 ft	10-12 ft	SB (West)
S836+	Cassidy Street	835+65	837+62	676 ft	14 ft	NB (East)
S841+	Cassidy Street	837+85	843+75	2083 ft	10-14 ft	SB (West)
S845	California Street	843+95	847+20	1194 ft	8 ft	SB (West)
S846+	California Street	844+00	848+55	1512 ft	8-12 ft	NB (East)
S849	Loma Alta Creek Bridge	847+20	851+12	1263 ft	12-14 ft	SB (West)
S862+	Brooks Street	859+95	862+40	807 ft	12-14 ft	NB (East)
S863	Oceanside High School	859+82	866+50	2189 ft	12-16 ft	NB (East)
S868	Mission Avenue	866+28	868+15	755 ft	16 ft	NB (East)
S871	Bush Street	869+15	874+45	1726 ft	8-10 ft	SB (West)
S882	Harbor Drive	881+08	882+95	620 ft	12 ft	NB (East)
S884	Harbor Drive	883+15	885+45	741 ft	12 ft	NB (East)

+ These soundwalls are preliminarily recommended to address severely impacted receptors.
SI = Severely Impacted Receptor

Table ES.18b: Secondary Consideration Soundwalls

SOUNDWALL	LOCATION	STATION BEGIN	STATION END	APPROX. LENGTH ft	HEIGHT RANGE ft	DIRECTION
S518	Torrey Villa Resort Apartments	517+00	520+58	1404 ft	10-12 ft	NB (East)
S543	Carmel Valley Road	541+75	542+55	259 ft	14 ft	SB (West)
S567	Del Mar Heights Road	565+75	567+20	459 ft	8 ft	SB (West)
S652	Birmingham Drive	651+69	652+72	407 ft	8 ft	NB (East)
S675	Encinitas Boulevard	672+30	676+55	1437 ft	8-10 ft	SB (West)
S680	Encinitas Boulevard	677+90	684+15	2178 ft	8-16 ft	NB (East)
S729	Navigator Circle	728+80	730+05	604 ft	10-12 ft	SB (West)

Table ES.19: Permits and Approvals Needed

Agency	Permit / Approval	Status
U.S. Fish and Wildlife Service*	Endangered Species Act Section 7 Consultation for impacts to Threatened and Endangered Species	Biological Opinion from USFWS issued on December 31, 2012
U.S. Army Corps of Engineers*	Concurrence on LEDPA	Concurrence on the LEDPA as part of NEPA/404 received on July 15, 2013
	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	CWA Section 404 anticipated submittal spring 2014 (post PWP/TREP finalization and after Federal Consistency is determined
	Marine Protection Research and Sanctuaries Act of 1972 Section 103 Permit for deposit of sediment into the ocean	Section 103 Permit anticipated submittal spring 2014 (post PWP/TREP finalization and after Federal Consistency is determined
	Rivers and Harbors Act Section 408 Permit for Federally Designed, Constructed, and Operated Structures	Section 408 Permit must be approved prior to CWA Section 404 Permit approval (San Luis Rey River)
National Oceanic and Atmospheric Administration/National Marine Fisheries Service*	Informal consultation with NMFS	Final consultation approved May 16, 2013
	Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat	Coordination completed January 3, 2013
California Department of Fish and Wildlife*	California Fish and Game Code (FGC) Section1602 Agreement for Streambed Alteration	Section 1602 Agreement anticipated submittal spring 2014 (post PWP/TREP finalization and after Federal Consistency is determined
Regional Water Quality Control Board – Region 9*	CWA Section 401 Certification	Section 401 Certification anticipated submittal spring 2014 (post PWP/TREP finalization and after Federal Consistency is determined

Table ES.19 (cont.): Permits and Approvals Needed

Agency	Permit / Approval	Status
California Coastal Commission*	CZMA Federal Consistency Certification	CZMA Federal Consistency Certification anticipated spring 2014
	Coastal Development Permit(s) (CDPs) for areas of retained jurisdiction	PWP/TREP Approval spring 2014
	Local Coastal Program (LCP) Amendments Public Works Plan (PWP) Approval	LCP Amendments and PWP Approval anticipated spring 2014
California Transportation Commission	Funds Appropriation and New Freeway Access	Funds Appropriation and New Freeway Access anticipated spring 2014
California Public Utilities Commission	Utility Construction Permit Request	Utility Construction Permit submittal anticipated fall 2013
Metropolitan Transit System	Construction and Maintenance Agreements for Sorrento Valley Overhead	Construction and Maintenance Agreements will be finalized after California Transportation Commission (CTC) approval
North County Transit District	Construction and Maintenance Agreements for Oceanside Overhead	Construction and Maintenance Agreements will be finalized after CTC approval
City of San Diego	Freeway Agreement for Voigt Drive DAR	Freeway Agreement will be finalized after CTC approval
City of Encinitas	Freeway Agreement for Manchester Avenue DAR	Freeway Agreement will be finalized after CTC approval
City of Oceanside	Freeway Agreement for Mission Avenue	Freeway Agreement will be finalized after CTC approval
	Freeway Agreement for Harbor Drive	Freeway Agreement will be finalized after CTC approval
	Revise Freeway Agreements for SR-76 and SR-78	Freeway Agreements will be finalized after CTC approval

* This federal and/or State agency has participated in the NEPA 404 process

Figures ES-1, Sheets 1 through 67 – Project Features Maps: 8+4 Buffer (Preferred Alternative)

These Project Features Maps are a replication of *Figures 2-2.3, Sheets 1 through 67 – Project Features Map: 8+4 Buffer (Preferred Alternative)* from *Chapter 2, Project Alternatives*, and retain those page numbers. The printed *Executive Summary* contains *Figures 2-2.3, Sheets 1 through 67,* after this page.

Chapter 1 - Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) propose improvements to maintain or improve the existing and future traffic operations on the existing Interstate (I-) 5 freeway from La Jolla Village Drive in San Diego to Harbor Drive in Oceanside/Camp Pendleton, extending approximately 27 miles (mi) from post mile (PM) R28.4 to PM R55.4 on I-5. *Figure 1-1.1* shows the limits of the proposed project.

The *I-5 North Coast Corridor (NCC) Project* sponsors include FHWA, Caltrans, and the San Diego Association of Governments (SANDAG). The proposed project improvements include one or two High Occupancy Vehicle (HOV)/Managed Lanes in each direction, auxiliary lanes where needed, and possibly one general purpose lane in each direction. The HOV/Managed Lanes would be available for carpools, vanpools, and buses at no cost, and would be available to Single Occupancy Vehicles (SOVs) for a fee when there is excess capacity. The proposed build alternatives and the No Build alternative are presented and discussed in this Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS), which has been prepared pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) and would be used for project compliance with State and federal laws and regulations. FHWA is the Lead Agency under NEPA and Caltrans is the Lead Agency under CEQA.

This Final EIR/EIS is based on the Draft EIR/EIS circulated in 2010 and the Supplemental Draft EIR/EIS circulated in 2012. The Draft EIR/EIS presented the project in its entirety and the Supplemental Draft EIR/EIS provided clarification on impact information related to lagoon crossings, potential sea level rise issues, and potential community and regional enhancements. Locations in this Final EIR/EIS where substantive changes were made to the document following publication of the Draft EIR/EIS are highlighted through the use of a vertical line in the left-hand margin.

This project is included in the 2007 Federal Statewide Transportation Improvement Program as amended in 2009 and 2011 (FSTIP) and is proposed for funding from the Capital Improvements Program. It is also included in the SANDAG 2050 Regional Transportation Plan (RTP) and the 2012 Regional Transportation Improvement Program (RTIP).

1.2 Purpose for the Project

1.2.1 Overall Project Purpose Statement

The *I-5 NCC Project's* main purpose is to maintain or improve the existing and 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 planning design year of 2035. Although the design year originally was 2030 based on Series 10 traffic forecasts, subsequent Series 11 and 12 forecasts have resulted in demand projections beyond that period consistent with those previously developed for 2030. The project Purpose and Need, as well as the associated analysis, remain valid.

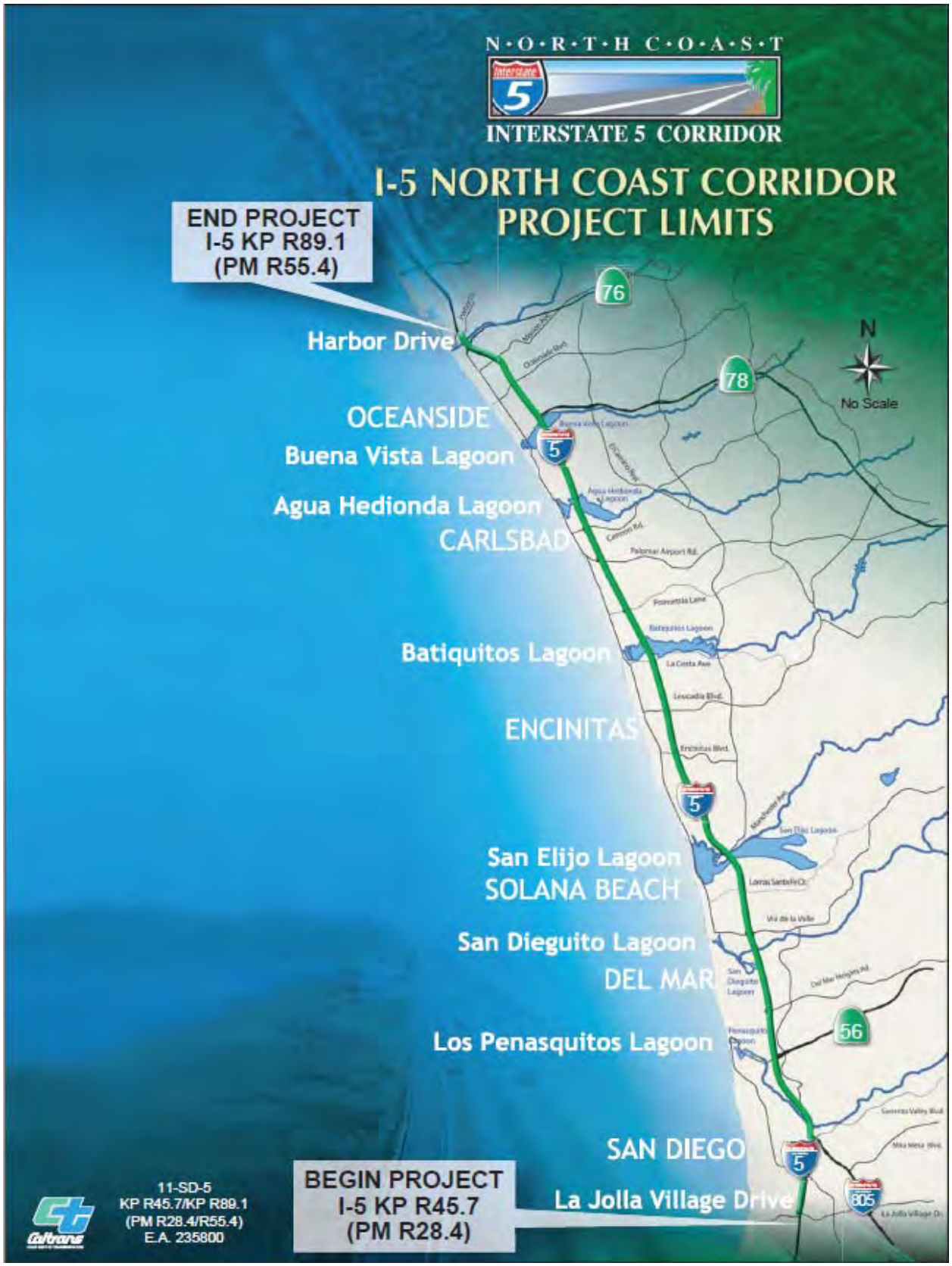


Image Source SANDAG

Figure 1-1.1: Project Location Map

Project Objectives were specified in the Draft EIR/EIS, and have been updated to reflect project construction phasing from 2030 to 2035 and the 2050 RTP[1] that was adopted by SANDAG on October 28, 2011.

The objectives of project are to:

- Maintain or improve future traffic levels of service in 2035 compared to existing levels of service;
- 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 project-level consistency with adopted Regional Transportation Plans, as appropriate, where feasible and in compliance with federal and State regulations;
- Maintain the facility as an effective link in the national Strategic Highway Network; and
- 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 25 minutes through this section of the corridor. The maintenance or improvement of future free-flow conditions also would support the viability of I-5 as an effective link in the Strategic Highway Network. 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; thereby eliminating the need for buses and other transit vehicles to access the HOV/Managed Lanes by weaving through the general purpose lanes. As a result, travel time reliability would be more assured for all HOV/Managed Lanes users, car poolers, BRT, and when capacity allows, paying single drivers.

1.3 Need for the Project

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. 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 over the next 40 years. Traffic forecasting of the region shows that if no improvements are made to I-5, traffic conditions will continue to deteriorate. Given existing levels of congestion combined with the projected numbers of future area residents and increase in potential I-5 users, almost certain future gridlock is anticipated. This would cause impacts on route operations and the ability to provide for the effective movement of people, goods, and services through and within the region; and could have profound economic consequences within both the region and the State.

The *I-5 NCC Project* is an integral part of the multimodal efforts to address this issue. Although it is not expected that all congestion would be eliminated along this segment of I-5, projections show that the project would reduce future conditions associated with up to 13 hours per day of congestion within the North Coast Corridor.

[1] On December 20, 2012, the San Diego Superior Court entered a judgment finding that the EIR for the 2050 RTP is legally inadequate with regard to greenhouse gas emissions. Although the judgment may be overturned on appeal, this Final EIR/EIS has been drafted to avoid the narrow alleged deficiencies found by the Court. Where this Final EIR/EIS relies upon 2050 RTP information, that information has not been challenged and is not part of the current lawsuit.

This project is therefore meant to address the present and anticipated deficiencies of I-5 only. As such, it provides environmental analysis of just one element, the highway portion, of transportation options within the North Coast Corridor. The other transportation elements of the regional transportation and mobility plan, and their interrelationship with the highway element, are contained in the RTP and Public Works Plan (PWP; published as a joint document with the Transportation Resource and Enhancement Program [TREP]), as additionally clarified throughout this section and in *Chapter 2, Project Alternatives*, and included in this Final EIR/EIS as Appendix R. The PWP addresses a number of other multimodal planned transportation projects within the North Coast Corridor.

1.3.1 Existing Circulation System and Infrastructure Constraints

The Cities of San Diego, Del Mar, Solana Beach, Encinitas, Carlsbad, and Oceanside maintain beach identities. I-5 was constructed through these communities in the mid-1960s and early 1970s, resulting in expansion and new development to the east of I-5 and tending to separate the original communities from the new developed areas. The development of additional highway transportation infrastructure in the North County coastal area is severely limited by existing circulation systems and residential/commercial development, as well as geographical and environmental constraints. These constraints have resulted in a mode split where travel on I-5 facilitates over two-thirds of the daily trips in the North Coast Corridor.

The proposed project area is situated within the unique coastal geography of southern California, where urbanized land uses and the natural environment combine. This area of I-5 parallels the Pacific coastline to the west and the coastal ranges to the east, as it traverses the rolling terrain, urbanized land uses, canyon topography, and numerous water resources running from the coastal ranges to the Pacific Ocean. I-5 crosses (or is adjacent to) residential, commercial, and industrial urbanized uses that have developed directly up to Caltrans' right-of-way. I-5 also is immediately adjacent to one lagoon, and crosses five lagoons and several rivers and creeks; all of which are major natural and visual resources. There are also many locations of critical habitat and/or locations directly along I-5 that serve as designated wildlife corridors for numerous plant and animal species that are protected by State and/or federal laws.

The existing physical and environmental constraints have contributed to the development of a transportation infrastructure system within the North Coast area. The north-south highway alternative to I-5 is I-15, which is located an average of 10 mi to the east. Highway access to I-15 is limited to three east-west highways in the north part of the county: State Routes (SR-) 56, 78, and 76. On I-5, SR-56 and SR-78 are separated by a distance of 18 mi, with Del Dios Highway being the only viable east-west arterial alternative.

The primary north-south arterial alternatives to I-5 are El Camino Real and County Route S21 (“Coast Highway”). Route S21 is a two- to four-lane road extending along the coast serving the established coastal communities within Del Mar, Solana Beach, Carlsbad, and Oceanside, and is a six-lane road in the vicinity of the Torrey Pines Municipal Golf Course. This 24-mi arterial traverses many of the same water resources in the project area and runs adjacent to existing rail right-of way.

El Camino Real is a major 16-mi arterial located 1 to 3 mi east of I-5. El Camino Real runs through the newer, developing inland areas of the communities of Encinitas, Carlsbad, and Oceanside. El Camino Real is 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.

The San Diego Northern Railway is the primary railroad in San Diego County, facilitating intercity passenger rail (Amtrak), peak period commuter rail (Coaster) and freight rail (Burlington Northern and Santa Fe Railway [BNSF]) services. The railroad is mainly single-tracked within the project area, constrained by surrounding urbanized land uses and Route S21.

Major Arterials

- Route S21, also known as Coast Highway (Oceanside), Carlsbad Boulevard (Carlsbad), Highway 101/First Street (Encinitas), South Highway 101 (Solana Beach), Camino del Mar (Del Mar), and North Torrey Pines Road and Genesee Avenue (San Diego) parallels I-5 about 0.5 mi to the west, traversing many of the same water resources in the project area. This is a primarily north-south arterial that is a two- to four-lane road running along the coast serving the established coastal communities within Del Mar, Solana Beach, Carlsbad, and Oceanside. Congestion on I-5 generally spills over onto S21, creating congestion as drivers seek an alternate coastal route.

- El Camino Real is an additional north-south arterial located one to three mi east of I-5, which runs through the newer, developing inland areas of the communities of Encinitas, Carlsbad, and Oceanside. El Camino Real becomes disjointed between the Cities of Encinitas and Solana Beach as the southern segment curves around the San Elijo Lagoon, through the community of Rancho Santa Fe. El Camino Real continues through Solana Beach and the community of Carmel Valley in the City of San Diego. There is extensive commercial development in the vicinity of El Camino Real interchanges at SR-76, SR-78, and SR-56. El Camino Real becomes congested during peak traffic hours as drivers seek an alternate parallel route to I-5.

Interstate Highway

- The north-south highway alternative to I-5 is I-15, which is east of I-5 and trends northeast. The distance between the two interstates ranges from 0 mi south of I-8 to about 28 mi at the Orange County line with an average of 10 mi. I-15 is not a feasible alternative route due to distance from I-5, congestion during peak traffic hours, direction of travel, and it does not directly serve Orange or Los Angeles counties.

State Highways

- SR-76 is a four-lane west to east freeway from I-5 east to North Santa Fe Avenue, and a four-lane conventional highway to Jeffries Ranch Road before tying into the existing two-lane highway road winding east to I-15 and beyond. SR-76 is located approximately three mi north of SR-78. It is listed on the California State Scenic Highway System and is an east-west corridor between the communities of western Riverside County and the work and recreational areas of north coastal San Diego County.

- SR-78 is the principal east-west arterial for northern San Diego County, linking I-5 with I-15 to the east. There is extensive commercial development along SR-78.

- SR-56 is located 18 mi south of SR-78 and is another east-west corridor that connects I-5 with I-15 to the east.

1.3.2 Traffic Demand

The majority of transportation planning studies in San Diego County use the SANDAG RTP as the basis for traffic projections. Their 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 typically produces a new regional traffic forecast every three to five years to incorporate updated data related to future land uses, planned infrastructure, and modal mix. The forecasts presented in this Final EIR/EIS and the associated technical studies are based on the Region's Series 10 model, whereas the Series 11 model was available during Draft EIR/EIS circulation and the current model is referred to as Series 12.

SANDAG adopted an updated RTP in October 2011, which reflects the region's latest development strategies and major transportation improvements to the year 2050.[2] The 2050 RTP includes a revised traffic model (Series 12, as noted), which builds upon some of the assumptions that were presented in Series 10. Series 12 continues to show I-5 in this area as containing 4 HOV/Managed Lanes; but consistent with the 8+4 Buffer alternative, assumes a minimum of 8 general purpose lanes rather than the 10 general purpose lanes assumed in Series 10.

Traffic volumes from traffic counts and forecasted 2030 volumes were compared to the highway capacity in its current configuration. Caltrans began environmental technical studies for the proposed project in 2006, basing those studies on the most current traffic projections then available, which were SANDAG's Series 10 projected traffic volumes for year 2030 for the 10+4 build alternatives. During the course of the project development process, SANDAG released both the Series 11 forecasts and model based upon the 8+4 build alternatives that are within one percent of the Series 10 forecasts. More recently, the Series 12 forecasts and model, including forecasts for year 2035, were within an average of 3.5 percent of the Series 10 model. Thus, there is not an appreciable change in predicted traffic volumes, as detailed in *Section 3.6, Traffic and Transportation/Pedestrian and Bicycle Facilities*. Upon review of these different data sets, the project team determined that the initial Series 10 2030 forecasted traffic volumes, provided for the basis of the original traffic studies, were indicative of year 2035 volumes and determined that a revision would not alter the results of the associated studies. These analyses are considered representative of what is expected to occur within the 2040 to 2050 timeframe.

Annual Average Daily Use

The project area experiences daily recurrent traffic congestion affected by population growth, increased goods movement, and economic growth in the region that is shown by the amount of time required for a vehicle to traverse the distance of the project. The I-5 corridor currently experiences periodic traffic congestion during weekday peak hours. The congestion corresponds with trips to activity centers along the project area. The project area begins south of the University of California San Diego (UCSD) Campus and Scripps Hospital, where institutional uses, employment centers, and public beaches are located. The project area continues north through two more employment centers near Del Mar Heights Road and Palomar Airport Road. Other trip generators in the project area include town centers, visitor attractions, regional retail, more public beaches, and transit centers. The current number of vehicles per day near La Jolla Village Drive is 87,200 for northbound and 82,500 for southbound; while near

[2] Please refer to footnote 1 on page 1-1 of this chapter.

Harbor Drive it is 62,600 for northbound and 60,000 for southbound. In 2030 (equivalent to 2035), the amount of vehicles per day would increase near La Jolla Village Drive to 111,500 for northbound and 123,150 for southbound; while near Harbor Drive, it would be 97,600 for northbound and 100,500 for southbound (*Figures 1-3.1a-f*).

Periodic traffic congestion would occur under the 10+4 and 8+4 alternatives. The number of vehicles per day for the 10+4 alternatives near La Jolla Village Drive would be 113,800 for northbound and 126,390 for southbound; while near Harbor Drive, it would be 105,500 for northbound and 104,700 for southbound. Under the 8+4 alternatives, the number of vehicles per day near La Jolla Village Drive would be 107,200 for northbound and 114,800 for southbound; while near Harbor Drive, it would be 105,300 for northbound and 105,500 for southbound (*Figures 1-3.2a-f*, located at the back of this chapter).

Travel demands on I-5 have grown considerably since the eight-lane facility opened in the late 1960s. There have been minimal improvements to the existing interstate facility since the original construction. Traffic demand has exceeded capacity, causing congestion, and would continue to do so as regional and interregional growth increases, creating even more demand for travel within the corridor.

As represented in *Table 1.3.1*, historic trends indicate that traffic volumes, represented by Average Daily Traffic (ADT), would continue to increase along the I-5 corridor without a project (No Build). These data were gathered through Performance Measurement Systems (PeMS) a real-time and historical traffic data collection, processing, and analysis tool based on data from the highway's existing detection systems. The forecasts for increased traffic volumes indicate that improvements to the existing facilities would be needed to maintain or improve highway operations in the future.

The existing average travel time during off-peak hours and in free-flow conditions to travel the project area in the northbound or southbound direction is between 23 and 25 minutes (*Table 1.3.2*). The existing northbound average a.m. peak travel time is between 24 and 25 minutes (*Table 1.3.2*). It currently takes between 33 and 39 minutes in the p.m. peak hours (*Table 1.3.2*). The existing southbound average a.m. peak travel time is between 31 and 44 minutes, and the p.m. peak travel is between 27 and 32 minutes (*Table 1.3.3*).

By 2030 (consistent with design year 2035, as described above), if no improvements are made, the projected average northbound travel time through the project area during the a.m. peak hours would be between 29 and 37 minutes (*Table 1.3.2*). It is projected to take between 67 and 69 minutes in the p.m. peak hours (*Table 1.3.2*). By 2030, if no improvements are made, the projected average southbound direction travel time through the project area during the a.m. peak hours would take between 53 and 54 minutes (*Table 1.3.3*). It is projected to take between 40 and 48 minutes in the p.m. peak hours (*Table 1.3.3*).

Table 1.3.1: Annual Average Daily Traffic (ADT)

Location		1970 ADT	1975 ADT	1980 ADT	1985 ADT	1990 ADT	1995 ADT	2000 ADT	Existing 2006 ADT	2030 ADT (No Build)
From	To									
La Jolla Village Drive	Genesee Ave	53,000	49,000	59,000	89,000	122,000	129,000	145,000	169,900	249,590
I-5 / I-805 Junction	Carmel Valley Road	48,000	75,000	103,000	155,000	219,000	213,000	254,000	281,400	412,640
Via de la Valle	Lomas Santa Fe	48,000	69,000	96,000	140,000	189,000	189,000	215,000	203,600	326,940
Encinitas Blvd	Leucadia Blvd	43,000	62,000	81,000	116,000	162,000	168,000	198,000	190,500	294,300
Palomar Airport Road	Cannon Road	44,500	61,000	79,000	109,000	156,000	159,000	190,000	188,500	290,100
SR-78	Oceanside Blvd	56,000	71,000	90,000	119,000	159,000	156,000	197,000	192,900	303,800
Mission Ave	SR-76	49,000	59,000	72,000	101,000	137,000	126,000	156,000	156,800	246,500

Table 1.3.2: Average Travel Time Northbound AM and PM

Conditions	Year	Off Peak Hours	AM Peak Hours	PM Peak Hours
		Travel time (min)	Travel time (min)	Travel time (min)
Existing Conditions	2006	23-25	24-25	33-39
Forecasted Conditions (No Build)	2030	--	29-37	67-69

Table 1.3.3: Average Travel Time Southbound AM and PM

Conditions	Year	Off Peak Hours	AM Peak Hours	PM Peak Hours
		Travel time (min)	Travel time (min)	Travel time (min)
Existing Conditions	2006	23-25	31-44	27-32
Forecasted Conditions (No Build)	2030	--	53-54	40-48

Along with increased travel time, forecasts also indicate that the increase in ADT would lengthen the amount of time congestion exists for the corridor in both the northbound and southbound directions, if no improvements were made. Currently, the duration of congestion in the northbound direction is approximately five hours in the p.m. peak hours, with no congestion in the a.m. peak hours (*Table 1.3.4*). In the southbound direction, the duration of congestion is approximately five hours in the a.m. peak hours, with no congestion in the p.m. peak hours (*Table 1.3.5*). By 2030 (consistent with design year 2035, as described above), it is forecasted that the duration of congestion in the northbound direction would be approximately 3.5 hours in the a.m. peak hours and 6 hours in the p.m. peak hours (*Table 1.3.4*), if no improvements are made. In 2030, the duration of congestion in the southbound direction is forecasted to be approximately six hours in the a.m. peak hours and seven hours in the p.m. peak hours (*Table 1.3.5*), if no improvements were made.

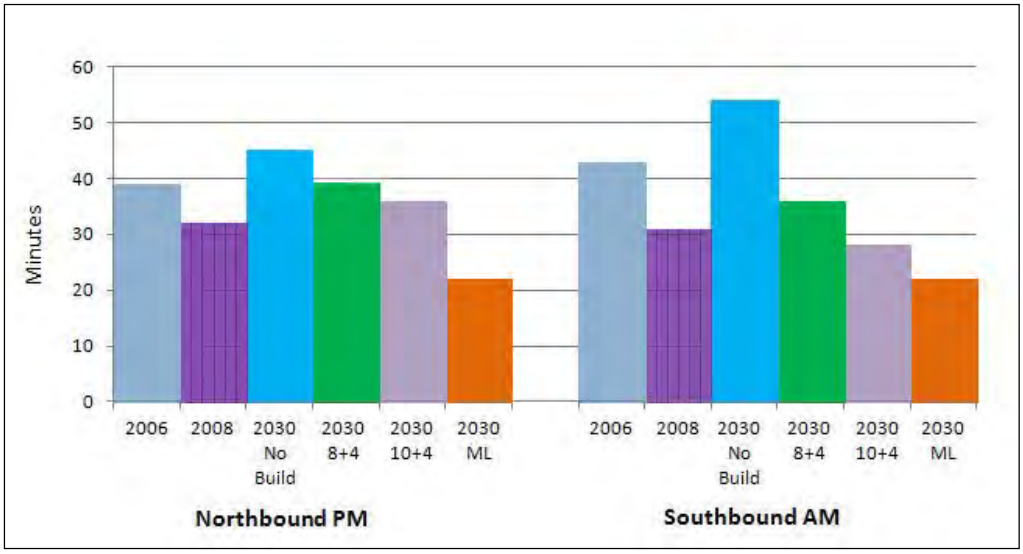
Table 1.3.4: Northbound AM and PM Weekday Peak Hour Congestion

Conditions	Year	AM Peak Hour			PM Peak Hour		
		Congestion		Duration (hrs)	Congestion		Duration (hrs)
		Begin	End		Begin	Begin	
Existing Conditions	2006	--	--	0	2:00	7:00	5
Forecasted Conditions (No Build)	2030	7:30	11:00	3.5	2:00	8:00	6

Table 1.3.5: Southbound AM and PM Weekday Peak Hour Congestion

Conditions	Year	AM Peak Hour			PM Peak Hour		
		Congestion		Duration (hrs)	Congestion		Duration (hrs)
		Begin	Begin		Begin	Begin	
Existing Conditions	2006	6:30	11:30	5	--	--	0
Forecasted Conditions (No Build)	2030	6:00	12:00	6*	12:00	7:00	7

* Congestion would continue through the a.m. and p.m. hours



Source: PeMS and I-5 Corridor System Management Plan (CSMP) Microsimulation Modeling Results; ML-Managed Lanes

Figure 1-3.3: Travel Time Benefits of the I-5 NCC Project

Weekend Use

There is an influx of traffic on weekends. Average travel times on Saturday and Sunday using 2003-2006 average travel times on I-5 within the project area revealed that the weekend does not have typical peak hours. Use of I-5 in the project area can be attributed to the majority of people having weekends free from work and to businesses that are open during the weekends operating on different schedules. There is, however, a notable travel trend on Saturday in the southbound direction and on Sunday in the northbound direction. There is an increased travel time period from 9:00 a.m. to 8:00 p.m. on Saturday, and on Sunday the increased travel time period is from 1:00 p.m. to 8:00 p.m. Saturday southbound peak average travel time occurs between 12:00 p.m. and 1:00 p.m., while Sunday northbound average peak travel time occurs between 5:00 p.m. and 6:00 p.m. In the southbound direction, there is a consistent peak, between 26 and 30 minutes, for most of the daytime; suggesting a constant, all day flow of traffic with a slight reduction in travel time (the peak average travel time is 35 minutes). In the northbound direction, the peak average travel time is 28 minutes.

HOV Use

During weekday peak periods, approximately 13 percent of the vehicles within the project limits are HOVs with two or more occupants. There is a directional tendency to the HOV demand volume between the northbound and southbound directions. The demand volume in the northbound direction is higher during the p.m. peak hour and lower during the a.m. peak hour. In contrast, the demand volume in the southbound direction is lower during the p.m. peak hour and higher during the a.m. peak hour (*Tables 1.3.6* and *1.3.7*). The HOV percentages are typically higher (13 to 23 percent) during the midday and the off-peak periods. (Source: San Diego Regional Vehicle Occupancy and Classification Study – 2000, SANDAG, Revised June 2002). This percentage is anticipated to increase approximately two to seven percent by 2030.

On weekends, I-5 serves a variety of local, regional, and interregional, as well as tourist and seasonal/event-generated, trips. During weekend peak periods, approximately 60 percent of the vehicles within the project limits are HOVs. The percentages of those vehicles are typically higher (55 to 65 percent) during peak travel times, midday southbound on Saturday, and northbound on Sunday.

SANDAG regional modeling data (SANDAG 2012) show that vehicle loads average 2.13 people per vehicle in HOV/Managed Lanes and 1.28 people per vehicle in general purpose lanes, with an overall lane capacity of 2,000 vehicles per hour. At capacity, the HOV/Managed Lanes can be expected to carry approximately 3,400 people per hour per lane, while general purpose lanes would carry 2,560 people per hour per lane; providing an efficient approach to providing additional capacity with minimal footprint expansion.

Table 1.3.6: Weekday Northbound HOV Volumes

Freeway Segment		Existing*		2030 No Build*		2030 10+4		2030 8+4	
From	To	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
La Jolla Village Drive	Genesee Avenue	X	X	X	X	1,500	1,280	1,600	1,530
I-5 / I-805 Junction	Carmel Valley Road	300	1,100	1,620	1,920	1,880	2,450	2,000	2,540
Carmel Valley Road	Lomas Santa Fe Drive	300	1,100	1,230	1,580	1,520	2,040	1,640	2,130
Santa Fe Drive	La Costa Avenue	X	X	X	X	1,900	2,270	2,120	2,470
La Costa Avenue	Cannon Road	X	X	X	X	1,820	2,170	2,030	2,180
SR-78	Oceanside Blvd	X	X	X	X	1,700	2,100	1,900	2,240

*HOV/Managed Lanes do not exist in areas designated with an "X"

Table 1.3.7: Weekday Southbound HOV Volumes

Freeway Segment		Existing*		2030 No Build*		2030 10+4		2030 8+4	
From	To	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Oceanside Blvd	SR-78	X	X	X	X	2,170	1,650	2,570	2,030
Cannon Road	La Costa Avenue	X	X	X	X	2,080	1,920	2,460	2,380
La Costa Avenue	Santa Fe Drive	X	X	X	X	2,050	1,880	2,410	2,330
Lomas Santa Fe Drive	Carmel Valley Road	1200	350	1,030	1,010	2,050	1,640	2,400	2,030
Carmel Valley Road	I-5 / I-805 Junction	1200	350	1,500	1,480	2,450	2,040	2,800	2,430
Genesee Avenue	La Jolla Village Drive	X	X	X	X	1,120	1,460	1,500	1,850

*HOV/Managed Lanes do not exist in areas designated with an "X"

Weaving Analysis

One source of vehicle conflict occurs where vehicles are required to change one or more lanes creating a "weaving section." This can contribute to bottlenecks, ramp queues, and reduction in travel time for general purpose lanes. This occurs most frequently at closely spaced interchanges, ramps, lane drops, or access points. Weaving between interchanges was analyzed for both the a.m. and p.m. peak hours in 21 freeway segments, at 1,800 vehicles per hour per lane (vphpl) for weaving lanes and 2,000 vphpl for general purpose lanes. Exceedances were identified based on high ramp volumes, main through lanes being above 2,000 vphpl, and auxiliary lanes exceeding 1,800 vphpl. In the existing condition, there were 6 a.m. peak and 17 p.m. peak exceedances in the northbound direction, and 16 a.m. peak and 8 p.m. peak exceedances in the southbound direction. Under 2030 No Build conditions, there would be 15 a.m. peak and 17 p.m. peak exceedances projected for the northbound direction, and 20 a.m. peak and 20 p.m. peak exceedances projected for the southbound direction.

Accident Analysis

The number of accidents and accident rates for July 2004 through June 2007 from the California Highway Patrol (CHP) accident database available through PeMS were used. The total accident rates along the project area were less than the Statewide average for total accident rates. There were three segments that were over the Statewide average for fatal plus injuries.

Other Related Congestion Analysis

In addition to the roadway deficiencies discussed above for I-5, other deficiencies are not limited solely to the highway. Highway congestion often causes regional and interregional trips to "spill over" onto local streets, as frustrated travelers exit the highway in search of less-congested routes. This results in through traffic using coastal access routes and local streets in attempts to bypass congestion, which can negatively affect the character of these coastal communities, as well as access to coastal resources. Improvements to I-5 would be expected to alleviate spillover and minimize bottlenecks as outlined below.

A bottleneck is a persistent drop in speed between two locations on the freeway, as seen through increased travel time due to the duration of bottleneck and queue length. There can be a number of causes: a visual distraction, an incident, a weaving section, or a change in capacity, such as a reduction of the number of lanes. There are consistently three major bottlenecks in the northbound direction during the p.m. peak period near Carmel Valley Road, Via de la Valle, and Lomas Santa Fe Drive; as well as smaller bottlenecks near Leucadia Boulevard and Cannon Road. In the southbound direction, there are bottlenecks during the a.m. peak near Via del la Valle, Manchester Avenue, and Birmingham Drive. During the p.m. peak, the southbound direction has bottlenecks at Birmingham Drive, Manchester Avenue, and Oceanside Boulevard. The No Build alternative would increase the duration and queue length for existing bottlenecks during the northbound a.m. peak, and would result in additional bottlenecks at La Jolla Village Drive and Del Mar Heights Road. The northbound p.m. peak would include bottlenecks near Del Mar Heights Road and Oceanside Boulevard. The No Build alternative southbound a.m. peak would include bottlenecks near Via de la Valle, Tamarack Avenue, and Manchester Avenue. The southbound p.m. peak would include bottlenecks near La Jolla Village Drive and Manchester Avenue.

Freeway interchanges were analyzed to assess if modifications could improve capacity and alleviate congestion at ramp intersections. In addition, all freeway on-ramp locations within the project limits would be metered to improve projected freeway operations while simultaneously not overloading surface streets with excessive queue lengths. The ramp meter rates for the interchanges within the project limits were analyzed and the length of time was developed from weaving results.

1.3.3 Population, Housing, and Employment

Travel demand in the project area has been influenced considerably by population and housing growth in the San Diego region. From 1970 to 2010, San Diego County more than doubled in population to over 3.2 million residents. The coastal communities in the area grew two- to three-fold, and are projected to continue to increase in population. The Cities of San Diego and Carlsbad grew over 500 percent over the noted 40-year period (*Table 1.3.8*).

Table 1.3.8: Project Area Population by Jurisdiction, Project Area, 1970 to 2040

Jurisdiction	1970	2010	2040	Change: 1970 to 2010	Change: 2010 to 2040
Oceanside	40,494	179,105	207,237	342%	20%
Carlsbad	14,944	103,491	127,434	593%	23%
Encinitas	17,210	64,599	75,446	275%	17%
Solana Beach	5,744	13,338	15,619	132%	17%
San Diego *(NCC only)*	23,315	160,290	209,744	587%	31%
Del Mar	3,956	4,455	5,059	13%	14%
Corridor Travel Shed	**105,663**	**525,278**	**647,832**	**397%**	**23%**
San Diego County	1,357,854	3,224,432	4,163,688	137%	29%

Sources: SANDAG 2050 RTP (Chapter 3), October 2011; Caltrans/SANDAG Series 12 Model, September 2011

There are currently over 500,000 people residing within the project area, which represents approximately 16 percent of the regional population. An additional 125,000 people are anticipated to reside in the project area by the year 2030, an increase of 25 percent (*Table 1.3.9*). There are approximately 197,000 housing units in the project area, representing 17 percent of the regional housing stock in San Diego County. An additional 36,000 housing units are anticipated to be constructed within the project area by 2030, a 19 percent increase (*Table 1.3.9*).

Table 1.3.9: Total Population Housing and Employment, North Coast Travelshed

	2000[a]	2006[b]	2010[c]	2020[c]	2030[c]	Change, 2000-2030	Change, 2006-2030
Population	463,215	509,810	561,365	607,973	635,678	37%	25%
Housing Units	183,826	196,921	217,818	229,411	233,645	27%	19%
Employment	318,766	N/A	360,740	391,584	424,625	33%	N/A

The project area includes portions of the Cities of Del Mar, Solana Beach, Encinitas, Carlsbad, Oceanside, Vista, and San Marcos; Marine Corps Base Camp Pendleton; and the County of San Diego

a. Source: 2000 U.S. Census
b. Source: SANDAG Current Population and Housing Estimates (January 2006)
c. Source: SANDAG Series 10 Final Regional Growth Forecast (December 2003)

Employment within the North Coast Corridor is primarily located along established transportation routes or concentrated into large activity/employment centers. A considerable portion of the project area employment is located in the City of San Diego, particularly within Sorrento Valley, Sorrento Mesa, the University/Golden Triangle area, and the UCSD campus. Future employment growth in the project area would continue to occur with these established employment centers, along with burgeoning centers in the eastern portions of Carlsbad and Oceanside (*Table 1.3.10*).

Table 1.3.10: Project Area Employment by Jurisdiction

Jurisdiction	2000[a]	2004[b]	2010[c]	2020[c]	2030[c]	Change, 2000-2030	Change, 2004-2030
Del Mar	3,842	4,335	3,940	4,071	4,232	10%	-2%
Solana Beach	8,870	9,416	9,569	9,913	10,314	16%	10%
Encinitas	24,240	25,012	26,061	28,337	29,736	23%	19%
Carlsbad	50,787	54,347	57,324	65,656	79,188	56%	46%
Oceanside	39,610	39,850	44,540	51,381	62,409	58%	57%
San Diego[d]	167,863	185,807	196,146	210,594	214,976	28%	16%

Note: Jurisdictions noted in this table represent a different geographic area compared to the North Coast Corridor

a. Source: U.S. Census Bureau
b. Source: SANDAG Employment Estimates (2004)
c. Source: SANDAG Series 10 Final Regional Growth Forecast (December 2003)
d. Census Tracts in the northern portions of the City of San Diego within the project travel shed

Interregional travel demand on I-5 is also influenced by growth in surrounding regions. Population growth in Riverside and Imperial Counties, as well as Baja California, Mexico, is anticipated to increase by 60 to 70 percent by the year 2030.

Growth forecasts for San Diego County and the surrounding regions have a tremendous impact on travel demand for I-5 in the project area. By the year 2030, travel demand in San Diego County is projected to increase to over 13.7 million trips, an increase of 25 percent. In the project area, travel demand would increase to over 3.2 million trips. Approximately one million of these trips are anticipated to use at least one segment of I-5.

Rail

The Los Angeles – San Diego – San Luis Obispo (LOSSAN) rail corridor is a north-south corridor that parallels I-5. The Amtrak Surfliner provides daily passenger service along the LOSSAN corridor while North County Transit District (NCTD) provides commuter service (the Coaster) within San Diego County. BNSF transports goods for interstate, intrastate, and international commerce. Improvements are proposed to the LOSSAN corridor; a Final Program EIR/EIS and Record of Decision (ROD) for the Los Angeles to San Diego portion was completed in 2007. Even with the proposed improvements, however, capacity would not be sufficient to address anticipated travel demand along the I-5 corridor in 2030. Additional information is provided below in *Section 1.4, History and Background*.

1.3.4 Legislation and Executive Orders

The *I-5 NCC Project* is a high priority project under the President's Executive Order (EO) 13274, Environmental Stewardship and Transportation Infrastructure Project Reviews, to "promote environmental stewardship" for major transportation infrastructure projects. EO 13274 states, "The Secretary of Transportation, in coordination with agencies as appropriate, shall advance environmental stewardship through cooperative actions with project sponsors to promote protection and enhancement of natural and human environment in the planning, development, operation, and maintenance of transportation facilities and services."

California Assembly Bill (AB) 574 (2007) gave SANDAG the authority to conduct, administer, and operate a value pricing and transit demonstration program on a maximum of two transportation corridors in San Diego County. AB 574 also authorizes SANDAG to operate the program indefinitely by deleting the four-year limitation provision. These facilities combine pricing and vehicle eligibility to maintain free-flow conditions, while still providing a travel time-savings incentive for transit, BRT, and HOVs, and reducing some demand on the general purpose lanes.

The 2004 TransNet Extension includes an Environmental Mitigation Program (EMP), which is a funding allocation category for the costs to mitigate habitat impacts for regional transportation projects. The EMP is a unique component of the TransNet Extension in funding allocation for habitat acquisition, management, and monitoring activities as needed to help implement the Multiple Species Conservation Program (MSCP) and the Multiple Habitat Conservation Program (MHCP). This funding allocation is tied to mitigation requirements for projects outlined in the RTP (MOBILITY 2030).

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 PWP that will provide for an integrated regulatory review by the CCC rather than a project-by-project approval approach. The PWP includes 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 discussion of the PWP is provided below in *Section 1.5, Other I-5 Considerations*.

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 program (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 and environmental mitigation and enhancement projects, as specified in the PWP

Each of the above provisions is anticipated as part of the *I-5 NCC Project* 8+4 Buffer alternative; as a result, the project is consistent with CA SB 468. Specific improvements by segment, as well as the timing of those improvements, are addressed in *Section 2.4, Phased Construction*, of this EIR/EIS.

1.3.5 Managed Lanes

The I-5 corridor has high travel demand with periodic traffic congestion during weekday peak hours, and is heavily traveled on weekends as a major interregional route for recreation and tourism. Managed Lanes seek to manage travel demand and encourage use of other travel modes in response to changing traffic and roadway conditions. Traffic and roadway conditions change throughout the day, affecting demand and performance on both the Managed Lanes and the adjoining general purpose travel lanes. Actively managing and controlling traffic though a combination of access control, vehicle eligibility, and pricing strategies combines elements to make the most effective and efficient use of a freeway facility. Specifically, Managed Lanes set aside certain freeway lanes and use a variety of operating strategies to move traffic more efficiently in those lanes regulated by vehicle eligibility (number of occupants or vehicle type),

amount of lanes with moveable median barrier to match the direction of commuter flow, pricing, and access control in response to changing conditions. The *I-5 NCC Project* proposes HOV and Value Pricing. HOV specifies the amount of riders in a vehicle, while Value Pricing uses fees/tolls for road use which vary with the level of congestion.

HOV lanes provide additional highway capacity through number of occupants in a constrained corridor while minimizing impacts to the environment and surrounding communities. These types of lanes are intended to give carpool users and bus riders a quicker and more reliable ride by bypassing areas of heavy traffic congestion during peak periods. HOV lanes can serve as a strong incentive for ridesharing, which can help to manage congestion and contribute to improving air quality.

Value Pricing is an option under Managed Lanes that provides additional highway capacity by allowing SOVs to pay to use the lanes when extra capacity exists, as approved by AB 574 (2007). These Managed Lanes would be monitored to ensure that all user groups (HOV, buses, and SOV) experience less congestion than the general purpose lanes to maintain free-flow conditions, while still providing a travel time-savings incentive for HOVs and reducing some demand on the general purpose lanes. These types of lanes provide flexibility in the overall highway facility, allowing for system and corridor management that can be changed on a daily basis or as corridor travel needs change in response to changing conditions, helping to manage congestion on all highway lanes and contribute to improving air quality.

These operating strategies to move traffic more efficiently in those lanes regulated by vehicle eligibility may vary by the time of day, or day of week, and allow flexibility for changes over the life of the facility as conditions change. This flexibility is within a larger network of connected and free-flowing Managed Lanes throughout San Diego County, a key strategy outlined in SANDAG's RTP. This provides options to travelers and increases trip reliability (reliable amount of time to make a trip). A traveler may choose to meet the eligibility requirements, such as including a permitted number of occupants (HOV), traveling in a certain vehicle, or paying for the use of Managed Lanes, especially if the general purpose lanes become congested. Therefore, the tolling capacities along the corridor would vary per changes in demand volumes throughout the a.m. and p.m. peak periods.

1.3.6 Independent Utility and Logical Termini

FHWA regulations (23 Code of Federal Regulations (CFR) 771.111[f]) require that an action:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;

2. Have independent utility or independent significance (be usable and require reasonable expenditure even if no additional transportation improvements in the area are made); and

3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Cutting a larger project into smaller projects may be considered "improper segmentation" under NEPA and piecemealing under CEQA. Regardless of segment size, the project should be evaluated for independent utility. A project is determined to have independent utility if it is able to function on its own, without further construction of an adjoining segment.

Logical termini simply means that the project uses rational end points for a transportation project (typically major intersecting roadways), as well as rational end points for review of potential environmental impacts (generally broader than strict construction termini). This last consideration includes consideration of whether environmental conditions at the project terminus are so sensitive that it would be difficult to continue future project phases (i.e., other foreseeable transportation improvements have been restricted to the point where environmental requirements would be difficult or impossible to satisfy).

Project implementation would result in improvements to the current traffic conditions within the corridor even if no additional or adjoining transportation improvements are made, and therefore the project has independent utility.

The project addresses north-south traffic on that portion of I-5 that is north of other improvements completed or proposed in the City of San Diego, and extends to the northern extent of the City of Oceanside, where traffic congestion eases due to military lands/open space providing the dominant uses rather than urban uses. These boundaries, or termini, are logical because the southern terminus connects to areas already improved, and the northern terminus point is located where the need for improvement ends, and is expected to remain low in population due to land ownership by federal government for the military base. The inclusion of the entire 27-mi stretch between the southern and northern end points, combined with expansion of potentially affected habitat review to encompassing lagoon systems crossed by I-5, incorporates the area potentially affected by project construction and operation, and allows for discussion of environmental matters on a broad scope.

The proposed improvements to this 27-mi stretch of I-5, including the HOV/Managed Lanes and bridge widenings, as well as pedestrian and bicycle upgrades, create a project that has independent use by local and "through" traffic users. It also represents a reasonable expenditure of public funds to benefit the local area, region, and—because of I-5's importance to Statewide transportation and inclusion as a part of the Strategic Highway Network—State and even national importance.

Implementation of the project would not restrict consideration of alternatives for other reasonably foreseeable transportation improvements. In fact, the project has been designed to integrate into and improve access to other non-automotive transportation options within the North Coast Corridor; including train, BRT, pedestrian, and bicycle use, during construction and operation.

The proposed project therefore satisfies requirements for independent utility and logical termini.

1.3.7 Other I-5 Projects

Other I-5 Corridor Projects

Although the *I-5 NCC Project* addresses congestion from the associated generation points (*Tables 1.3.2* through *1.3.5)* and encompasses an area large enough to also address related environmental concerns, there are several additional proposed operational improvements within the North Coast Corridor. These operational improvements do not require the proposed project to be implemented, nor are they themselves required because of project implementation.

The *I-5 NCC Project* does not preclude alternatives for these operational improvement projects, all of which are included in the SANDAG RTP. For any of these projects to be considered and approved prior to the completion of the environmental review process under NEPA and CEQA for the proposed I-5 *NCC Project*, they would have to satisfy the following requirements:

- Demonstrate independent utility
- Present logical termini
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements
- Where practicable/feasible, minimize impacts to sensitive resources

The following is a list of those projects that would move forward independently from the *I-5 NCC Project* and be analyzed within separate environmental documents.

- I-5 / Genesee Avenue Interchange Improvements
- 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
- I-805 northbound DAR at Carroll Canyon Road and HOV lanes between Carroll Canyon Road and the I-5 / I-805 junction

LOSSAN

The LOSSAN rail corridor connects San Luis Obispo to major metropolitan areas of southern California, serves some of the most populous areas of the state, and (for corridor portions relevant to the proposed project) extends through three counties: Los Angeles, Orange, and San Diego. It is the second busiest intercity rail corridor in the nation. The corridor houses Amtrak's Pacific Surfliner service, Metrolink, and Coaster commuter rail services, as well as the BNSF and Union Pacific (UP), which provide freight service on the corridor, predominantly from the Ports of Los Angeles and Long Beach. The Final Program EIR/EIS for the Los Angeles to San Diego portion of the project was released in September 2007, and a ROD was issued March 18, 2009 by the Federal Railroad Administration (FRA). The purpose was to establish a program of projects for the rail corridor needed to support existing and proposed long-term levels of rail service, which includes intercity passenger rail, commuter rail, and freight/goods movement. Collectively, they lay out a vision for the phased enhancement of this heavily used rail corridor. Moreover, the efficiencies as a result of rail improvements carry over to all users of the rail corridor and also benefit commuter rail and freight services, making them even more cost effective. Rail improvement projects are in various stages of development, from preliminary engineering and environmental review to pre-final design.

The rail line, originally established by the late 1800s, traverses some of California's most scenic and environmentally sensitive areas, and is located for extended stretches directly adjacent to the Pacific Ocean. Communities were established and grew around the rail line; as a result of these geographic and social constraints, opportunities for the corridor's expansion are limited.

The existing alignment traverses natural drainages, small creeks, rivers, lagoons, and wetland habitats. The alignment also traverses habitats for threatened and endangered species, and crosses numerous 100-year floodplain zones and areas subject to liquefaction.

Caltrans continues efforts to coordinate phasing of the LOSSAN project so as not to preclude alternatives for LOSSAN. San Diego LOSSAN projects being planned as of November 2012 are summarized in *Table 1.3.11*, with projects 7 through 15 and 21 being located within the *I-5 NCC Project* study area.

Del Mar Fairgrounds

The 2008 Master Plan for the Del Mar Fairgrounds and Horsepark includes both immediate proposed projects as well as conceptual, long-term projects for a period of 25 years. The Del Mar Fairgrounds (Fairgrounds) is an approximately 340-acre (ac) fairgrounds and racetrack facility located in the Cities of Del Mar and San Diego that includes a 65-ac equestrian facility (Horsepark). There is also an off-site property, not owned by the 22nd District Agricultural Association (22nd DAA), located at the corner of Jimmy Durante Boulevard and San Dieguito Drive. The Horsepark is located approximately 1.5 mi east of the Fairgrounds in the San Dieguito River Valley at Via de la Valle and El Camino Real. The immediate proposed projects would provide maintenance and improvement to the current Fairgrounds facilities, including renovation and modernization of several structures and parking areas, construction of new structures, demolition of structures, and relocation of a maintenance yard and fire station. The long-term projects are conceptual and would provide for maintenance of existing facilities as well as construction of new structures and trails. The long-term projects would require additional planning in the future to define precise building parameters and may require additional environmental analysis. Future projects for the Horsepark remain conceptual in nature and, therefore, would be subject to further evaluation at a later date and were not addressed in the 2008 Master Plan EIR. A DAR at Via de la Valle may be analyzed through a separate environmental analysis by others in conjunction with the anticipated traffic impacts from the Del Mar Fairgrounds projects.

Carlsbad Energy Center

The Carlsbad Energy Center Project would be a 558 megawatt (MW) gross combined-cycle generating facility configured using two units, with one natural-gas-fired combustion turbine and one steam turbine per unit to meet the electrical resource needs as defined by San Diego Gas and Electric (SDG&E). Application for Certification was filed with the California Energy Commission (CEC) and was accepted as complete on October, 31, 2007, and the CEC approved the project for construction on May 31, 2012. This would provide rapid response to demand, helping to support local use and overall system reliability. Carlsbad Energy Center LLC, an indirect wholly owned subsidiary of NRG Energy, Inc., proposes to develop a natural gas-fired generating facility in the City of Carlsbad in San Diego County. This would reconfigure approximately 23 ac of existing land zoned for public utilities at the Encina Power Station in the City of Carlsbad. The goal is to bring this facility online by 2016.

Table 1.3.11: LOSSAN San Diego Projects

	Bridge/ Milepost #	CIP No.	Project Name	FY 13 CIP Open to Public	Funded Through Phase	Total Approved Funding ($M)
1	Br. 207.6	1143500	San Mateo Creek Bridge	Nov-12	Construction	8.0
2	Br. 208.7	1144900	North Green Beach Bridge	Jun-16	Preliminary Engineering	0.5
3A	212.3 to 218.1	1144200	San Onofre to Pulgas Double Track (Design and Stage 1)	Mar-15	Construction	37.4
3B	212.3 to 218.1	TBD	San Onofre to Pulgas Double Track (Stage 2)	TBD	Design	TBD
4	222.8 to 223.6 & Br. 223.1	1141600	Santa Margarita River Bridge	Dec-12	Construction	40.6
5	225.3 to 225.9 & Br. 225.4	1239809	Eastbrook to Shell Double Track (San Luis Rey River Bridge)	TBD	PS&E*	6.9
6	226	1143600	San Luis Rey Transit Center	Mar-13	Construction	2.7
7	226.1 to 227.2	1239803	Oceanside Through Track	Dec-13	Construction	19.5
8	228.5 to 229.5 & Br. 228.6	1239810	Carlsbad Village Double Track	TBD	PS&E*	6.0
9	229.5 to 231.4 & Br. 230.6	1239804	Carlsbad Double Track	**Mar-12**	Construction	20.2
10	233.2 to 234.4	1239805	Poinsettia Station Improvements	Mar-14	Construction	13.0
11	238.5 to 238.5	1143800	Encinitas Pedestrian Crossing (Santa Fe)	Sep-12	Construction	5.9
12	239.6 to 241.1 & Br. 240.4	1239806	San Elijo Lagoon Double Track (Cardiff to Craven)[1]	Dec-16	Construction	76.7
13	242.2 to 243.3 & Br. 243.2	1239813	San Dieguito Double Track and Platform	TBD	Environmental Clearance*	9.5
14	244.1 to 245.6	1143000	Del Mar Bluffs Stabilization 3	**Jan-12**	Construction	4.8
15	Br. 246.1, 246.9 & 247.1	1145000	Los Peñasquitos Lagoon Bridges	Jun-15	Construction	8.9
16	247.7 to 248.8 & Br 247.7, 248.5, 248.7	1239807	Sorrento Valley Double Track	Jun-15	Construction	33.7
17	24.8 to 251.0 & Br 249.9	1239801	Sorrento to Miramar Phase 1	Sep-13	Construction	42.0
18	251 to 253	1239812	Sorrento to Miramar Phase 2[1]	TBD	PS&E*	11.0
19	257.9 to 260.5	1239811	Elvira to Morena Double Track[1]	May-16	Construction*	78.7
20	265.2 to 262.0	1239808	Tecolote/Washington St. Crossovers	Jun-13	Construction	11.1
21	NA	1239814	COASTER Preliminary Engineering	NA	Preliminary Engineering	1.0
					Program Total	**438.1**

Notes:
* Federal Railroad Administration grants fund these projects through preliminary engineering/environmental phase only; FY—fiscal year; CIP—Capital Improvements Program; $M--millions of dollars
[1] Number of bridges uncertain at this time
Bold indicates the project has completed construction and is in close out

As part of the Carlsbad Energy Center Project, existing steam boiler Units 1, 2, and 3 at the Encina Power Station would be retired. The retirements would occur upon the successful commercial operations of the new Carlsbad Energy Center generating units. The retirements would create substantial environmental benefits, including permanent air emission reductions from the boiler units; elimination of the 225 million gallons per day of cooling water (seawater) intake capacity for Units 1 through 3 and the resulting decrease in impingement and entrainment of marine organisms attributed to those units' cooling water flow; cessation of wastewater discharge to the Pacific Ocean from Units 1 through 3; and elimination of the use of potable water attributed to the existing operation of Units 1 through 3.

The Carlsbad Desalination Project by Poseidon

The Carlsbad Desalination Project would provide San Diego County with a locally controlled 50-million gallon per day (56,000 acre-feet [ac-ft] per year) seawater desalination plant and associated water delivery pipelines for high-quality water that meets or exceeds all State and federal drinking water standards. The project is located at the Encina Power Station in the City of Carlsbad. The desalination plant is a four-ac parcel in a portion of the site.

Public water agencies serving the Cities of Carlsbad, Oceanside, San Marcos, San Diego, Encinitas, Solana Beach, Rancho Santa Fe, Escondido, Chula Vista, and National City, and the unincorporated communities of Rainbow, Bonsall, and Fallbrook would be the direct beneficiaries of a new and reliable water supply.

One Paseo

The proposed One Paseo Project is a mixed-use development encompassing approximately 24 ac at the intersection of Del Mar Heights Road and El Camino Real in the Carmel Valley community of San Diego. The project would include approximately 250,000 gross square feet (GSF) of commercial retail development (e.g., a movie theater and grocery store), 484,000 GSF of corporate and professional office space, and up to 608 multi-family residential units. Additional proposed uses within the project site include open space, internal roadways, landscaping, utility improvements, and parking facilities. Associated off-site improvements include frontage improvements, utility extensions, and access road/intersection improvements along Del Mar Heights Road. The project is currently anticipated to be constructed in 2014/2015.

1.4 History and Background

Transportation within the North Coast Corridor incorporates a number of individual modes, including cars and trucks, trains, trolleys, buses, bicycles, and pedestrians. I-5 represents the primary motor vehicle element in the corridor, is a principal north-south transportation facility in the western United States (extending from the Mexican border to the Canadian border), and is part of the National Highway System. Within the North Coast Corridor, I-5 serves as the commuter link for the coastal communities of San Diego County and the regional link with the Los Angeles Metropolitan area. I-5 also serves as the predominant freight, goods movement, and commerce facility in the region. Currently, between five to seven percent of the total trips on I-5 are made by trucks. This percentage of freight trucks, in conjunction with rolling terrain, can create conflicting speed differentials between trucks and automobiles.

1.4.1 Environmental Planning Process to Date

There have been numerous programmatic and project-specific transportation-related studies conducted for the North Coast Corridor over the past 30 years, with these studies updated and refined to identify the best mix of transportation options for the corridor. Some of the key studies are summarized below.

Summary of General and Focused Planning

During the 1980s, traffic on I-5 increased steadily with regional population growth and the major restructuring of the region's economy from sector-based manufacturing to cluster-based service and high technology employment. By the late 1980s, traffic congestion on I-5 became an issue of regional concern, and in the early 1990s, Caltrans conducted an operational study of I-5 from I-805 to Camp Pendleton to assess long-range highway needs to the year 2015. The geographic and population constraints on I-5, as well as nearby coastal rail facilities and parallel arterials, led transportation agencies to the conclusion that a corridor-level study was needed to address the long-range needs of this multimodal transportation corridor and that long-range planning would be likely to require multiple transportation options rather than focusing on a single form of transportation.

Between 1995 and 1997, Caltrans, SANDAG, and other stakeholders conducted scoping meetings; and from 1997 to 2000, Caltrans and SANDAG completed a number of studies summarized in the 2000 SANDAG North Coast Transportation Study (NCTS); in order to develop a Major Investment Study (MIS)[3] for the corridor, as prescribed by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. That study screened options for addressing transportation shortfalls and improving all forms of transportation from 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, and reversible car pool lanes). The MIS identified transportation deficiencies within the study area (summarized in Section 5.10 of the PWP/TREP; Appendix R of this Final EIR/EIS) and recommended long-range improvements for highways, bus transit, passenger and freight rail, commuter rail transit, and arterials/roads to address corridor travel demands to the year 2020.

The recommended highway program included HOV lanes for the length of the study area, along with general purpose lanes from Del Mar Heights Road to north of Oceanside. In addition, double-tracking the rail line was recommended to help provide an efficient commuting alternative to the freeway.

The North Coast Corridor, however, has limited transportation alternatives other than I-5. Even with the proposed full double-tracking of the rail line and increasing the number and capacity of the trains, the 2030 daily projection of riders was fewer than 30,000. The arterial street system is also inadequate to provide a viable alternative to I-5 given its disjointed and non-contiguous state. A new north-south transportation corridor was examined as part of SANDAG's NCTS; however, it was rejected due to substantial environmental impacts and community opposition.

[3] The goals of the MIS were to provide the full range of transportation modal alternatives that would: (1) be cost-effective, (2) promote and provide incentives for ridesharing and alternative modes, (3) accommodate regional and interregional freight movements, (4) mitigate environmental and community impacts, and (5) enhance the visual quality unique to the corridor.

While rail agencies moved forward with more focused rail studies,[4] 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, with related studies of those alternatives subsequently initiated by Caltrans. The PSR also included further study for one of the alternatives on I-5 from Del Mar Heights Road in San Diego to Vandegrift Boulevard/Harbor Drive in Oceanside. This alternative was identified as the long-range improvement concept for this portion of I-5 in the 2000 RTP.

In preparation of the 2003 RTP, SANDAG had adopted regional policies that directly influenced the long-range improvement concept for the North Coast Corridor as well as the scope of the proposed PSR alternative. These regional policies included the Regional High Occupancy Vehicle/Managed Lanes Study completed by SANDAG in 2002, which identified future HOV and Managed Lane facilities in the San Diego Region. The study concluded that the I-5 within the North Coast Corridor required a four-lane HOV/Managed Lanes facility to meet forecasted HOV demands in the year 2030 (equivalent to 2035). This future facility would be part of a larger regional HOV/Managed Lanes system that included similar Managed Lanes facilities on I-15 and I-805.

In response to shifts in regional policies, Caltrans redefined the proposed PSR alternative to reflect the design year and the recommended HOV/Managed Lanes facility, as reflected in the I-5 North Coast Corridor Draft Project Report (DPR). The resulting alternative proposed four HOV/Managed Lanes from I-805 to Harbor Drive, and two additional general purpose lanes from SR-56 to Leucadia Boulevard. In order to support the future regional BRT service on I-5 to El Camino Real, DARs on I-805 in Sorrento Valley and on I-5 at Manchester Avenue were included in this alternative (with additional discussion of the DARs provided below). This alternative was subsequently adopted as the long-range improvement concept for this portion of I-5 in the 2003 RTP, known as MOBILITY2030. Subsequent technical studies revealed that the two proposed general purpose lanes were also needed from Leucadia Boulevard to SR-78 to meet year 2030 (equivalent to 2035) demand.

The scope of this alternative was further expanded with the inclusion of the future proposed HOV/Managed Lanes freeway-to-freeway I-5 overpass at Los Peñasquitos Creek. Initially proposed in the Regional HOV/Managed Lanes Study, this viaduct is a critical segment of the HOV/Managed Lanes network that connects proposed HOV lanes on I-5 with the proposed four-lane HOV/Managed Lanes facility on I-5 at the I-805 junction. Furthermore, the future HOV lanes on I-805 just south of the I-5 / I-805 junction were determined to be an integral part of the proposed *I-5 NCC Project* HOV/Managed Lanes facility, due to limited highway access from I-5 into Sorrento Valley. In late 2003, the proposed alternative was re-scoped to include I-5 from north of La Jolla Village Drive to I-805, and I-805 from north of Mira Mesa Boulevard to I-5.

After the adoption of the 2003 RTP, development of the alternative continued with a further examination of the design features of the proposed Managed Lanes facility in the median of I-5. Design features and operational issues related to Managed Lanes such, as DARs, intermediate access points (IAPs), and facility separation were further examined. The DARs are ramps that allow traffic to directly enter and exit the HOV/Managed Lanes located in the center of the

[4] Programmatic-level plans for rail improvements within the North Coast Corridor (and beyond) were addressed in the 2007 LOSSAN Rail Corridor Final Program EIR/EIS. Potential improvements include a mix of adding tracks to double-track 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 LOSSAN Corridor Project Prioritization Analysis. Currently, a number of rail-focused efforts are underway, including double-tracking, bridge replacement, and stabilization efforts.

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 HOVs. IAPs, or at-grade access, allow traffic to move in and out of the HOV/Managed Lanes from the general purpose lanes of the freeway.

The NEPA 404 Integration Memorandum of Understanding (MOU) process provides for more timely decision making while improving the overall quality of those decisions by fostering agreement among the signatory agencies. The signatory agencies agreed that four build alternatives would be developed from the described alternative to provide a broader level of alternatives analysis. These four build alternatives vary in the level of freeway capacity expansion as well as method of separating the proposed Managed Lanes facility in the median of I-5 from the existing freeway facility.

The scope of the four proposed build alternatives was further expanded with the inclusion of the future proposed braided ramps on I-5 between Sorrento Valley Road/Roselle Street and Genesee Avenue. This freeway operational improvement was initially identified in the "I-5 Corridor/Sorrento Valley Road/Roselle Street and Genesee Avenue" PSR in October 2004.

In 2006, SANDAG conducted a Managed Lanes Value Pricing Study to validate the feasibility of implementation "value pricing" on the proposed Managed Lanes facility on I-5. Based on the proposed four build alternatives, the proposed Managed Lanes facility on I-5 was found to be viable for value pricing in the MIS-defined corridor.

In early 2007, the portion of the proposed project on I-805 was identified for State funding under the Corridor Mobility Improvement Account (CMIA), as passed by voters under Proposition 1B in November 2006. The construction of the HOV lane and DAR on I-805 was subsequently removed from the proposed project and developed as an independent project.

FHWA, Caltrans, and SANDAG assembled a project Review Team consisting of core members of the project development team (PDT) and subject matter experts working together to perform a Cost Certification Study in May 2013. "Moving Ahead for Progress in the 21st Century Act" (MAP-21), signed into law in July 2012, requires verification of the reasonableness of the current total cost estimate to complete the *I-5 NCC Project* and identify the risks and opportunities of this project. This Major Project Cost Estimate Review (CER) of the cost and schedule estimates for the *I-5 NCC Project* was conducted by the Review Team, which then selected probability distributions that described the range of possible values that were expressed as a probability curve.

This Cost Certification Study demonstrated that the updated 2013 cost estimate is consistent with cost estimating standards for this project. Consistent with MAP-21, the objective of the study was to verify the reasonableness of the current total cost estimate to complete the *I-5 NCC Project* and identify the risks and opportunities of this project. The Review Team (through the CER workshop) used risk-based probabilistic approach to review the major risks and opportunities associated with the project estimates of both cost and schedule. This Cost Certification Study demonstrated that the updated 2013 cost estimate is consistent with cost estimating standards for this project. The estimate account is in current year dollars and the build alternative cost estimates are as follows:

- 8+4 Buffer (Preferred Alternative): $3.062 billion
- 10+4 Barrier: $4.495 billion
- 10+4 Buffer: $3.601 billion
- 8+4 Barrier: $4.121 billion

This CER was held for the entire project using the 8+4 Buffer (Preferred Alternative) even though funding is only available for the first four stages of Phase 1. As described in the RTP, funding for the rest of the project is not programmed at this time. This CER is consistent with new MAP-21 guidelines, which allow for incrementally funded improvements for project phases that provide independent utility to the public. Construction on the first phase is planned to begin in early 2015.

Project Phases

Phase 1 (2013 to 2020): Construct HOV/Managed Lanes and auxiliary lanes on I-5 from La Jolla Village Drive to the I-5 / I-805 merge, and from Lomas Santa Fe to SR-78. This first phase also would include the replacement of the San Elijo Lagoon Bridge and the Batiquitos Lagoon Bridge, as well as implementation of the Manchester Avenue and Voigt Drive DARs.

The current vision for Phase 1 is the addition of HOV/Managed Lanes from La Jolla Village Drive to the I-5/I-805 merge, including: HOV-to-HOV connectors at the I-5 / I-805 merge and a DAR at Voigt Drive; construction of one HOV/Managed Lane in each direction from Manchester Avenue to SR-78; replacement of MacKinnon Avenue Overcrossing; construction of a DAR and park-and-ride facility at Manchester Avenue; replacement of San Elijo and Batiquitos Lagoon Bridges; and construction of soundwalls on private property. Phase 1 would be delivered using five separate construction packages or units as described below.

- Phase 1- Unit 1 - Limits: From Lomas Santa Fe to Birmingham Drive
  - Description: Ultimate widening through San Elijo Lagoon; replacement of San Elijo Lagoon Bridge; Construction of DAR and San Elijo Multi-use Facility; and construction of soundwalls.

- Phase 1- Unit 2 - Limits: From Birmingham Drive to Leucadia Boulevard
  - Description: Construction of one HOV/Managed Lane in each direction, replacement of MacKinnon Avenue Overcrossing, provision of pedestrian access at Santa Fe Drive and Encinitas Boulevard, and construction of soundwalls on private property.

- Phase 1- Unit 3 - Limits: From Leucadia Boulevard to Palomar Airport Road
  - Description: Construction of One HOV/Managed Lane in each direction, ultimate widening through Batiquitos Lagoon, and construction of soundwalls on private property.

- Phase 1- Unit 4 - Limits: From Palomar Airport Road to SR-78
  - Description: Construction of one HOV/Managed Lane in each direction and soundwalls on private property.

- Phase 1- Unit 5 (Not Funded): Addition of HOV/Managed Lanes from La Jolla Village Drive to the I-5/I-805 merge, including HOV-to-HOV connectors at the I-5 / I-805 merge and a DAR at Voigt Drive.

Phase 2 (2020 to 2030): Construct ultimate HOV/Managed Lanes, and auxiliary lanes on I-5 from the I-5/I-805 merge to Palomar Airport Road.

Phase 3 (2030 to 2035): Construct HOV/Managed Lanes and auxiliary lanes on I-5 from Palomar Airport Road to Harbor Drive.

The CER used the current year estimates, which are the same as the 11-page estimate updated in May 2013. Adjustments were made based on input from the team as shown in *Table 1.4.1, Base Estimate Adjustments*. This estimate is now used as the revised current year estimate for the Preferred Alternative. The CER then removes the standard contingency and replaces it with the risk register estimate. From there, the CER incorporates market rates and inflation into a probability distribution to provide the cost of the project for the Year of Expenditure (YOE).

Table 1.4.1. Base Estimate Adjustments

$2,922,000,000	**State Estimate (Current Year)**
	Adjustments
$96,000,000	Environmental mitigation
$4,020,000	Bio acoustic mitigation/monitoring during construction
$4,530,000	Weeding costs during construction
$33,196,411	6B - Traffic Signing and Striping
$137,746,000	Total change
$3,061,000,000	**Adjusted State Estimate (Current Year)**

Current Planning Status

The studies noted above evaluated multiple transportation options within the North Coast Corridor. The third decade of I-5 studies began with release of the Draft EIR/EIS for the *I-5 NCC Project*, which, as indicated above, represents one element in this much larger and ongoing multi-agency effort. The *I-5 NCC Project* is responsive to SANDAG's multimodal vision to include highway improvements as a critical contributing element in reducing both existing and projected congestion in the corridor. The build alternatives addressed in the Draft EIR/EIS were designed to be consistent with the RTPs current throughout the planning process, and were developed in coordination with NEPA 404 Integration Agency and other public input.

Following circulation of the Draft EIR/EIS and receipt of comments, the 8+4 Buffer alternative, the smallest of the build alternatives, was refined. The refined 8+4 Buffer alternative was determined to be the locally preferred alternative (LPA) in 2011 and was addressed in the August 2012 Supplemental Draft EIR/EIS.[5] That document provided information about a number of topics for which information was not available prior to circulation of the Draft EIR/EIS, as well as clarification of project design based on continued engineering refinement since 2010.

The primary focus was on refined bridge evaluations. Lagoon hydrology was evaluated at each of the six lagoons within the North Coast Corridor and issues such as storm water flow, tidal flow, sediment dispersal, etc. were evaluated relative to I-5 bridge designs. Changes to bridge length

[5] The 2050 RTP 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 the current SANDAG RTP planning period, consistent with the original conclusion in the Draft EIR/EIS.

at three of the project-crossed lagoons (San Elijo, Batiquitos, and Buena Vista) were found to be environmentally beneficial.[6] Topics for which additional information was provided included:

- 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 (of the Resource Enhancement and Mitigation Program, or REMP [referred to as the Resource Enhancement Program, or REP, in the Supplemental Draft EIR/EIS])
- Community enhancement projects at lagoon locations with impact assessments
- Phased construction approach
- Air quality conformity
- Sea level rise strategies

After circulation of the Supplemental Draft EIR/EIS, project planning continued, with additional extensive coordination with the resource agencies regarding potential project impacts and appropriate project minimization and mitigation. Following completion of Clean Water Act Section 404(b)(1) analysis to ensure that the refined 8+4 Buffer alternative is in fact the Least Environmentally Damaging Practicable Alternative (LEDPA), the 8+4 Buffer alternative is now also identified as the Preferred Alternative. The above information has been incorporated into this Final EIR/EIS as appropriate, and is reflected in project description information provided in *Chapter 2;* as well as environmental analysis sections addressed in *Chapter 3, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures*, and *Chapter 4, California Environmental Quality Act Evaluation*.

For ease of continuity between this Final EIR/EIS and the Draft EIR/EIS, the Preferred Alternative continues to be addressed throughout the analysis as the refined 8+4 Buffer alternative.

1.5 Other I-5 Considerations

1.5.1 Corridor System Management Plan

There is a Corridor System Management Plan (CSMP) for the travel way along the I-5 North Coast Corridor. CMIA funded projects include a provision for CSMP to address the transportation system as a multimodal whole, and integrate land use to promote multimodal analysis. Multimodal analysis focuses on how transit, local roadways, highways, pedestrian routes, and land use work together as a system. As a living document, the CSMP would be revisited and updated to analyze the effect improvements have on mobility due to improvement implementation and/or as new data and technologies become available. This promotes a strategy that prioritizes resources to phase in improvements across jurisdictions and transportation modes to achieve enhanced productivity, mobility, reliability, accessibility, and safety.

[6] Based on technical data vetted by the resource agencies' technical specialists, longer bridge lengths at the other two lagoons where I-5 crosses the lagoon feature (San Dieguito and Agua Hedionda Lagoons) were not shown to provide substantial benefit compared to cost. Only a minimal widening would occur at Los Peñasquitos Lagoon crossing.

1.5.2 Public Works Plan

Because the majority of the transportation, community, and resource enhancement improvements associated with the project are located within the California Coastal Zone, they are subject to the coastal resource protection policies of the California Coastal Act and the Coastal Zone Management Program, or, as applicable to the highway and community enhancement projects, the certified LCPs of the corridor cities.

SANDAG and Caltrans have prepared the Draft North Coast Corridor PWP/TREP to plan for and implement a series of transportation, community, and resource enhancement projects in a comprehensive and coordinated manner to meet the region's mobility vision while ensuring compliance with the California Coastal Act. Initially released for public review in 2010, subsequently released for additional public review in March 2013 and now updated; the PWP is a coordinated permitting document that supports federal consistency certification and approval of the *I-5 NCC Project* elements within the jurisdiction of the CCC and applicable certified LCPs to ensure that program components are implemented to provide for maximum protection and enhancement of public access, recreation, and sensitive coastal resources.

The PWP/TREP 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. It has been released in combination with the TREP. The PWP/TREP describes both I-5 and LOSSAN improvements; and it 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 *Chapter 3* of this document). This approach is consistent with the 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. All this information can be found in the PWP/TREP, which is provided in Appendix R.

Additional information about the Draft EIR/EIS alternatives, the refined 8+4 Buffer alternative (Preferred Alternative), and the PWP/TREP can be found at www.keepsandiegomoving.com, under the I-5 Express Lanes Project, with detailed information regarding alternative design (including the refined 8+4 Buffer) located in *Chapter 2* of this document.

1.5.3 National Defense

I-5 is also a critical transportation link for national defense and transportation security, providing direct and indirect access to major military installations in the southwestern United States including Naval Air Station North Island, Marine Corps Air Station Miramar, Marine Corps Recruiting Depot, and Marine Corps Base Camp Pendleton. I-5 is identified as a Strategic

Highway Network link, providing defense access, continuity, and emergency capabilities for movement of personnel and equipment in both peace and war times.

1.5.4 Corridor of the Future

On September 10, 2007, the U.S. Department of Transportation announced six interstate routes that would be the first to participate in a new federal initiative to develop multi-state corridors to help reduce congestion. The "Corridors of the Future" program aims at developing innovative national and regional approaches to reduce congestion and improve the efficiency of freight delivery. The selected corridors carry 22.7 percent of the nation's daily interstate travel.

The routes are anticipated to receive the following funding amounts to implement their development plans: $21.8 million for I-95 from Florida to the Canadian border; $5 million for I-70 in Missouri, Illinois, Indiana, and Ohio; $15 million for I-15 in Arizona, Utah, Nevada, and California; $15 million for I-5 in California (outside of San Diego County), Oregon, and Washington; $8.6 million for I-10 from California to Florida; and $800,000 for I-69 from Texas to Michigan.

The proposals were selected for their potential to use public and private resources to reduce traffic congestion within the corridors and across the country. The concepts include building new roads and adding lanes to existing roads, building truck-only lanes and bypasses, and integrating real-time traffic technology, such as lane management that can match available capacity on roads to changing traffic demands.

1.5.5 Moving People Rather Than Vehicles

The efficiency of a transportation system can be measured by the mobility benefits it provides in relation to its costs. Because each vehicle on a highway contributes to congestion, maximum efficiency is achieved when every vehicle is carrying the greatest amount of people or goods possible. While this is not a realistic scenario for all travelers—circumstances often require travel in SOVs—high-occupancy travel is still something that can be encouraged with incentives. HOV/Managed Lanes are one such incentive, as they offer travelers a choice between single travel with risk of delay, or carpooling to bypass congestion. In this way, the HOV/Managed Lanes prioritize the movement of people over the movement of vehicles, and achieve both better mobility and higher lane capacity per dollar spent. As noted in *Section 1.3.2*, under the discussion of HOV Use, above, during peak conditions one HOV/Managed Lane can carry nearly 70 percent more people than one general purpose lane.

1.5.6 Lagoon Resources

Along this portion of the I-5 corridor there are numerous existing natural and visual resources associated with North Coast Corridor waterways. Los Peñasquitos Creek, Carmel Valley Creek, and the San Luis Rey River cross under I-5 before terminating at the ocean. They provide wildlife corridors from inland San Diego County to the coastal region. I-5 also crosses six lagoons and/or related rivers and creeks – San Dieguito, San Elijo, Batiquitos, Agua Hedionda, Buena Vista, and Los Peñasquitos. These waterways offer habitat to federally listed wildlife (coastal California gnatcatcher [*Polioptila californica californica*]), State and federally

listed wildlife (California least tern [*Sterna antillarum browni*], and light-footed clapper rail [*Rallus longirostris levipes*]), State-listed wildlife (Belding's savannah sparrow [*Passerculus sandwichensis beldingi*]), and Fully Protected Species (clapper rail, least tern and peregrine falcon [*Falco peregrines*]). In addition, sensitive wetland communities occur along the creek and rivers and within the lagoons.

Caltrans' and FHWA's environmental policies recognize the need to protect and enhance the quality of life in accordance with the environmental, economic, and social goals of the State. Both agencies are mindful of the sensitivity of the coastal resources and the ongoing lagoon restoration efforts established as a result of State, county, and various foundation efforts, as well as from required mitigation for previously permitted federal and/or State projects (*Table 1.5.1*). Both agencies would seek to not impede these efforts and would identify opportunities to minimize potential project impacts to the maximum extent practicable.

The protection of important coastal environmental resources, such as the lagoons and coastal bluffs, would also be a consideration when designing improvements to the I-5 North Coast Corridor. Enhancements of sensitive environmental habitat would be incorporated where feasible and practicable when considering cost, logistics, and technology.

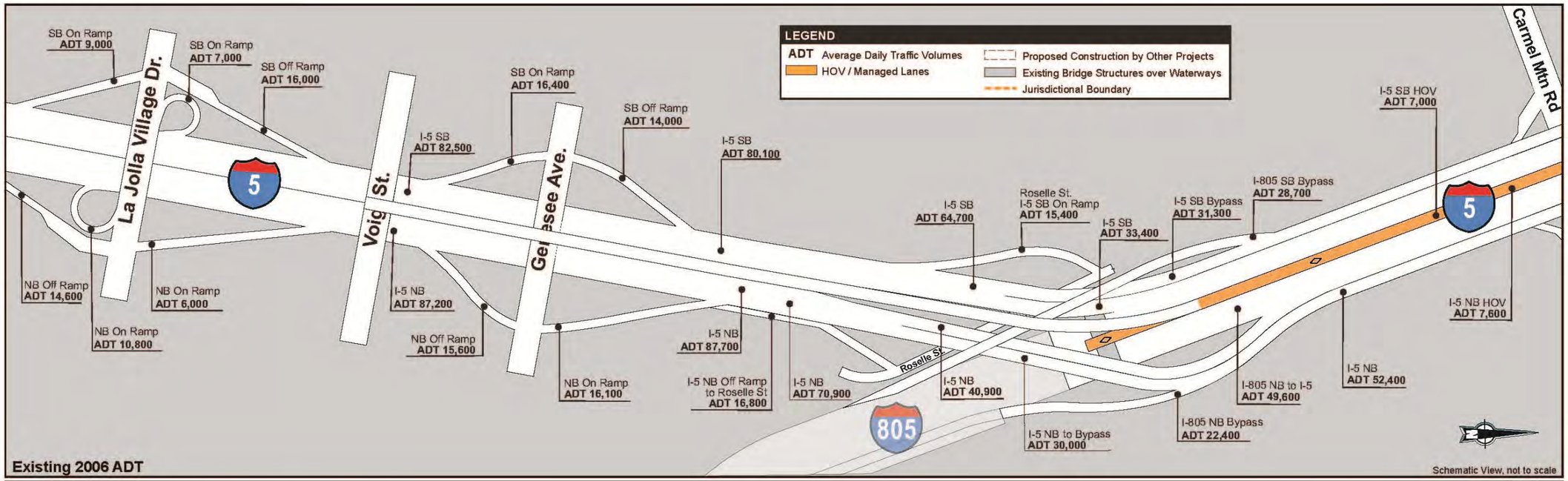
Table 1.5.1: Ongoing Lagoon Restoration Efforts

Lagoon	Lagoon Foundation / Website	Proponent of Ongoing Restoration Efforts / Website	Status of Restoration Efforts	Length of Existing I-5 Bridge
Los Peñasquitos	Los Peñasquitos Lagoon Foundation www.lospenasquitos.org	Updating Enhancement Plan to begin Environmental Documents on Restoration alternatives in 2014	N/A	421 ft (Bridge over Carmel Creek)
San Dieguito*	San Dieguito River Park www.sdrp.org	SONGS Final Restoration Plan: http://www.sce.com/sc3/006_about_sce/006b_generation/006b1_songs/006b1c_env_prot/006b1c3_songs_miti/006b1c3g_restoration_plan.htm San Dieguito Lagoon Wetland Restoration Project: http://www.sdrp.org/projects/coastal.htm	Restoration project constructed; currently in plant establishment/ monitoring phase San Dieguito Lagoon Wetland Restoration Project in EIR process	650 ft
San Elijo	San Elijo Lagoon Conservancy www.sanelijo.org	San Elijo Lagoon Conservancy, County of San Diego, and U.S. Army Corps of Engineers (USACE) are the State and federal environmental leads City of Encinitas: www.sanelijo.org/news/news/htm	Draft environmental documents for restoration of the lagoon to be released in spring 2013	340 ft

Table 1.5.1 (cont.): Ongoing Lagoon Restoration Efforts

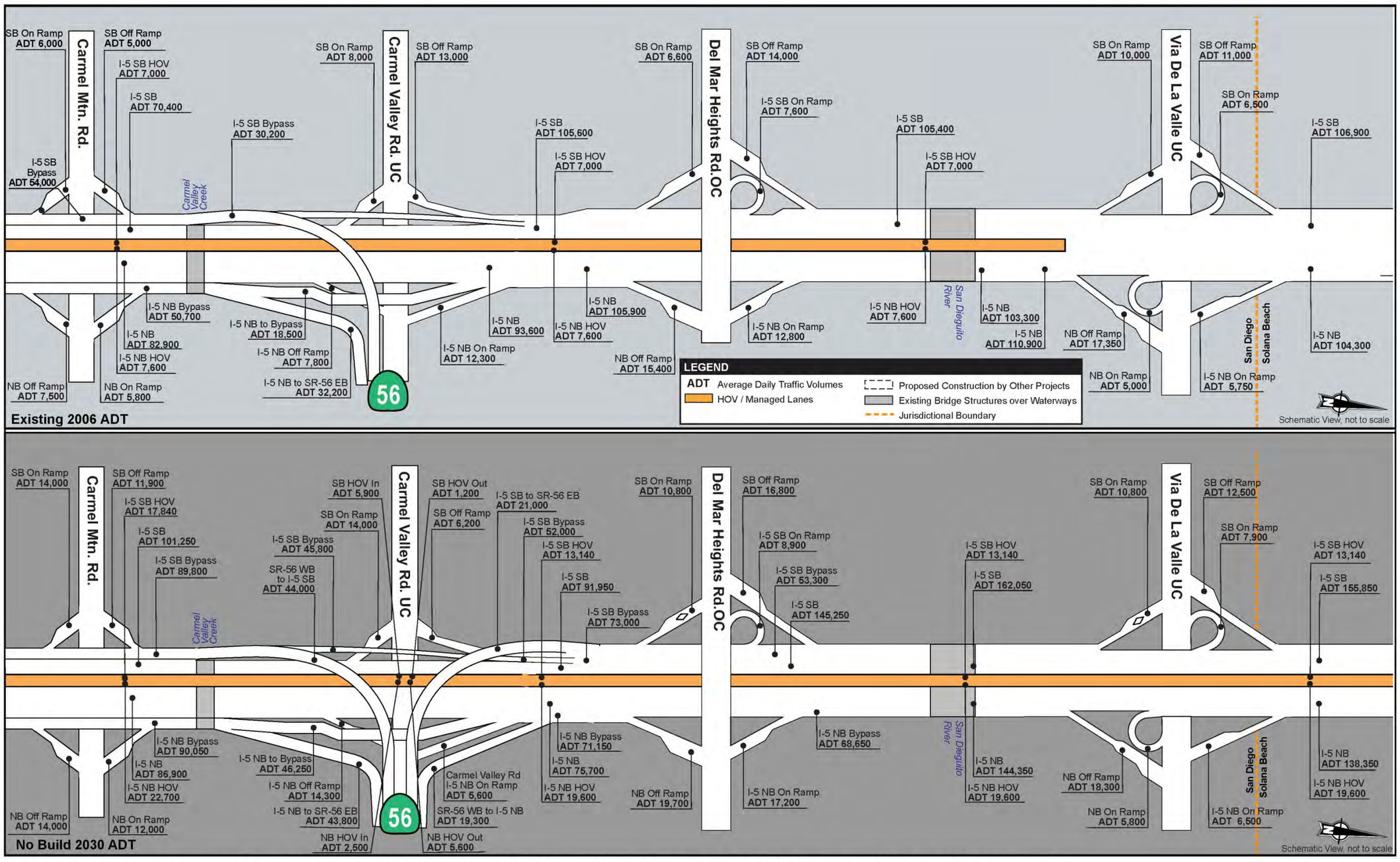
Lagoon	Lagoon Foundation / Website	Proponent of Ongoing Restoration Efforts / Website	Status of Restoration Efforts	Length of Existing I-5 Bridge
Batiquitos*	Batiquitos Lagoon Foundation www.batiquitosfoundation.org	The Port of Los Angeles: www.batiquitos.org National Marine Fisheries Service: http://swr.nmfs.noaa.gov/hcd/batproj.htm#Project%20Background	Restoration completed in 1996; monitoring occurred for a period of 10 years post-construction	219 ft
Agua Hedionda	Agua Hedionda Lagoon Foundation www.aguahedionda.org	The Foundation expressed a preference for keeping the existing open water regime at the lagoon	Restoration Feasibility Analysis completed June 2004	191 ft
Buena Vista	Buena Vista Lagoon Foundation www.buenavistalagoon.org	SANDAG will fund the environmental process. California Department of Fish and Wildlife (CDFW; previously California Department of Fish and Game) and USACE and are the State and federal lead agencies Buena Vista Lagoon Foundation: http://buenavistalagoon.org/index.html	Hydraulic regimes being studied; project alternatives being developed	102.4 ft

* The restoration plans for the San Dieguito Lagoon and Batiquitos Lagoon were modeled using the existing I-5 bridge openings



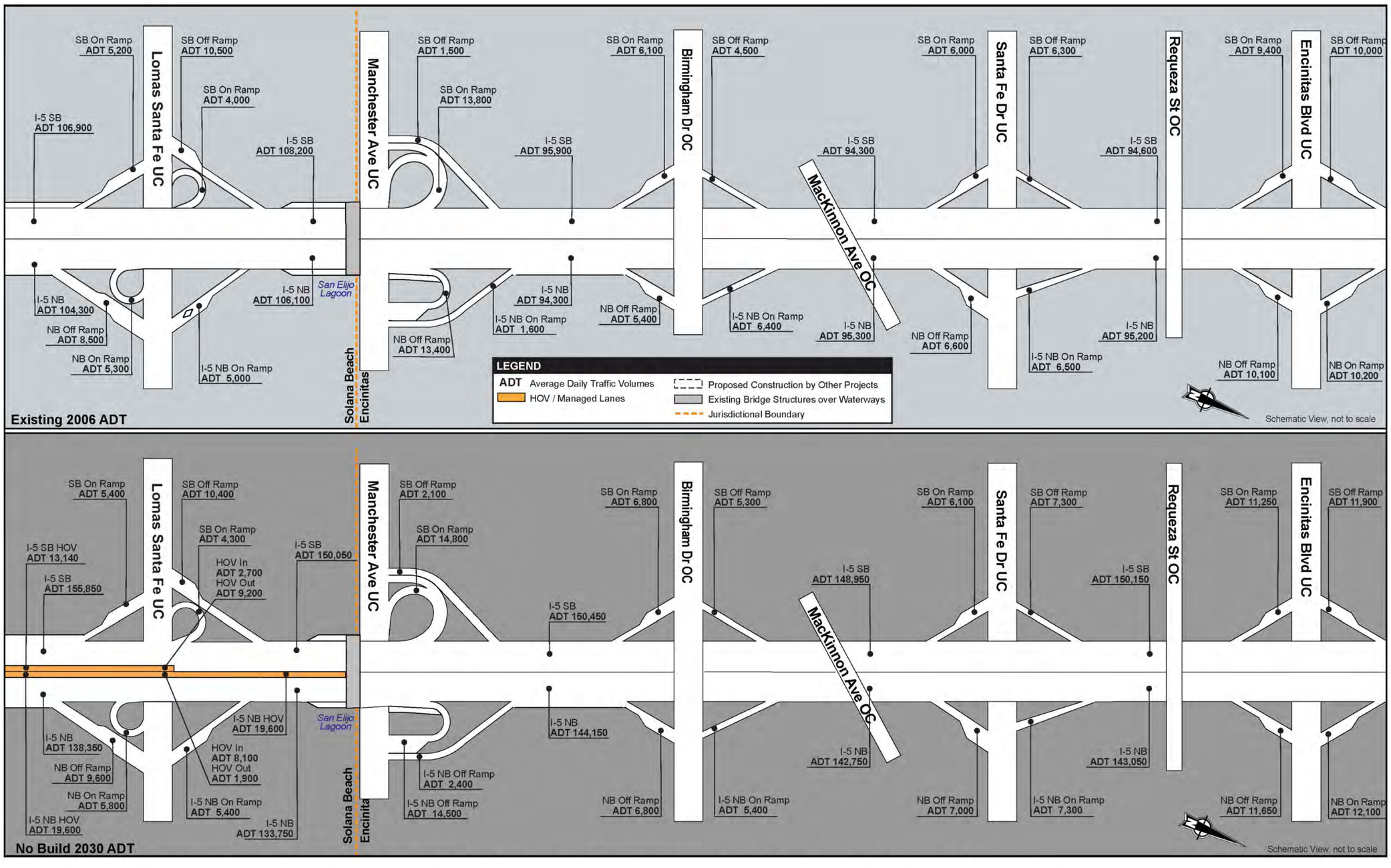
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.1a: Average Daily Traffic Volumes for 2006 Conditions and 2030 No Build Alternative



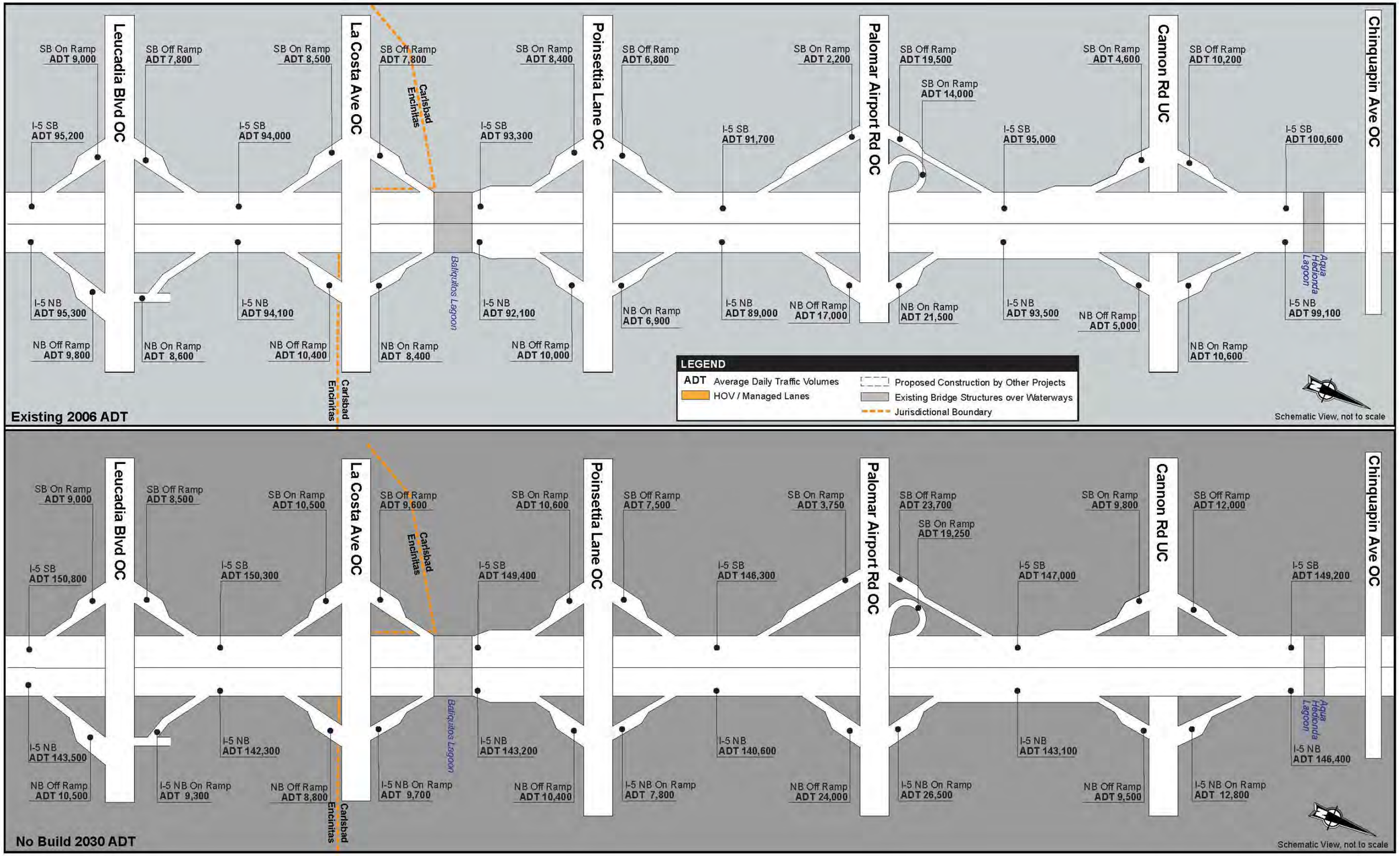
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.1b: Average Daily Traffic Volumes for 2006 Conditions and 2030 No Build Alternative



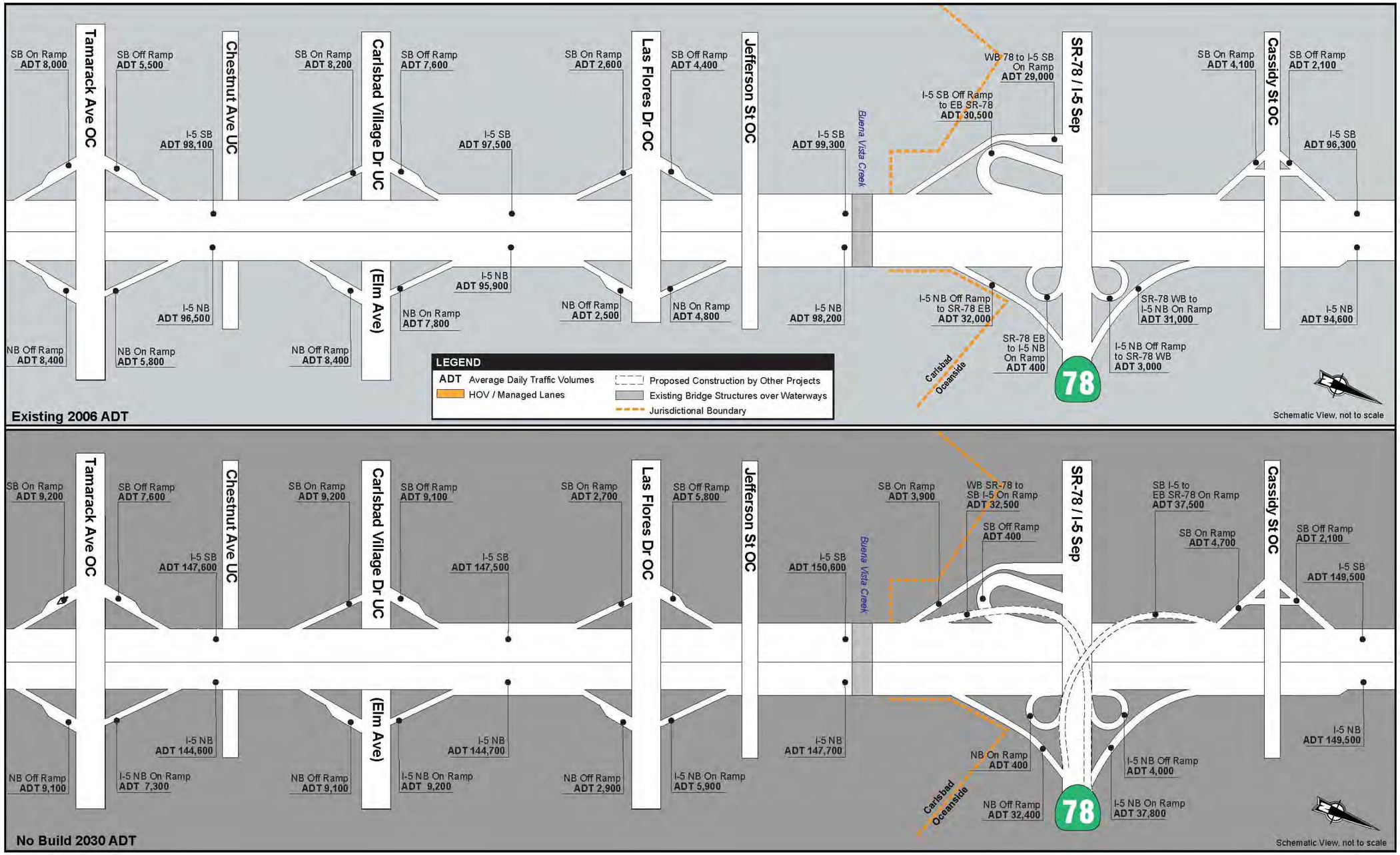
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.1c: Average Daily Traffic Volumes for 2006 Conditions and 2030 No Build Alternative



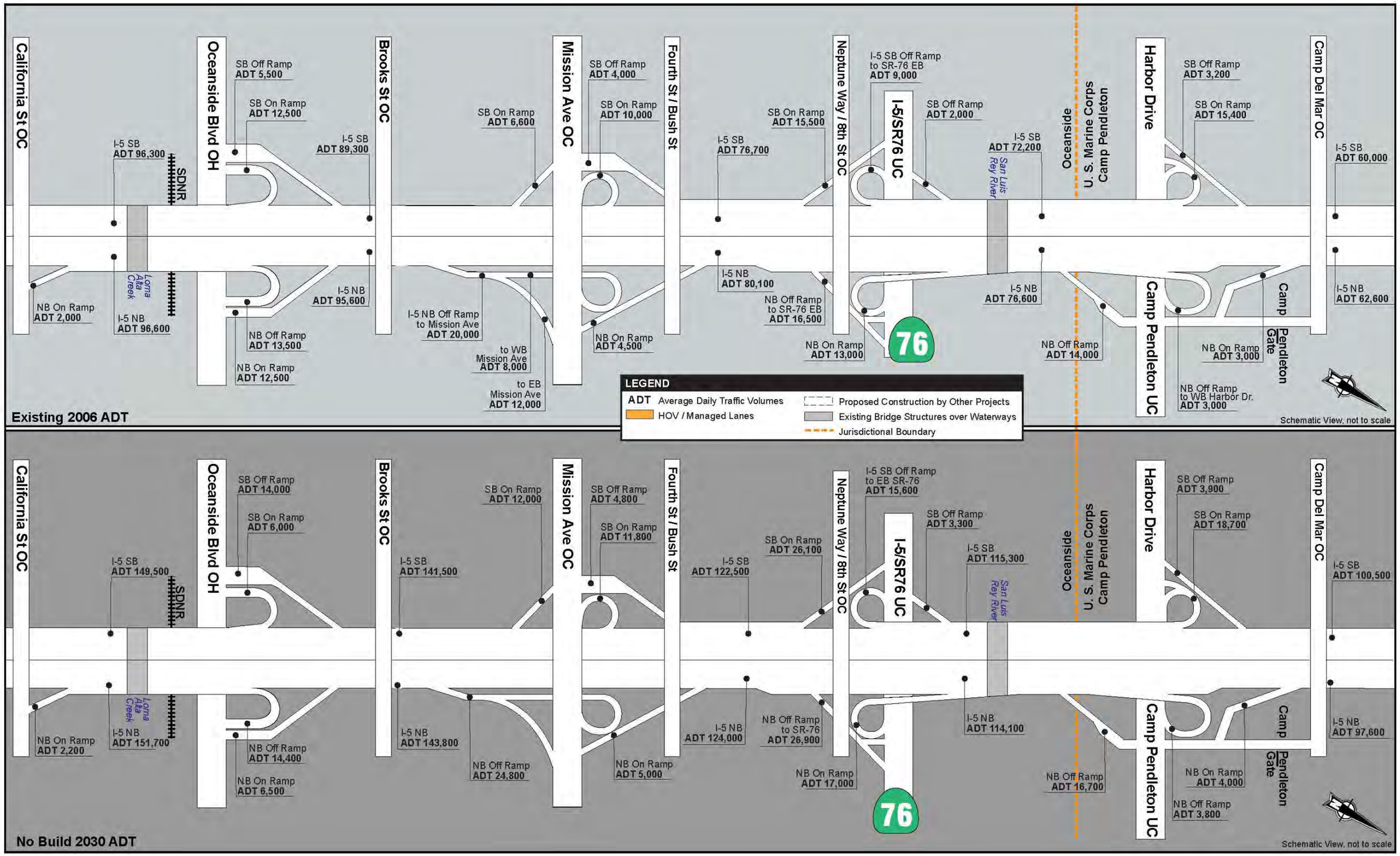
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.1d: Average Daily Traffic Volumes for 2006 Conditions and 2030 No Build Alternative



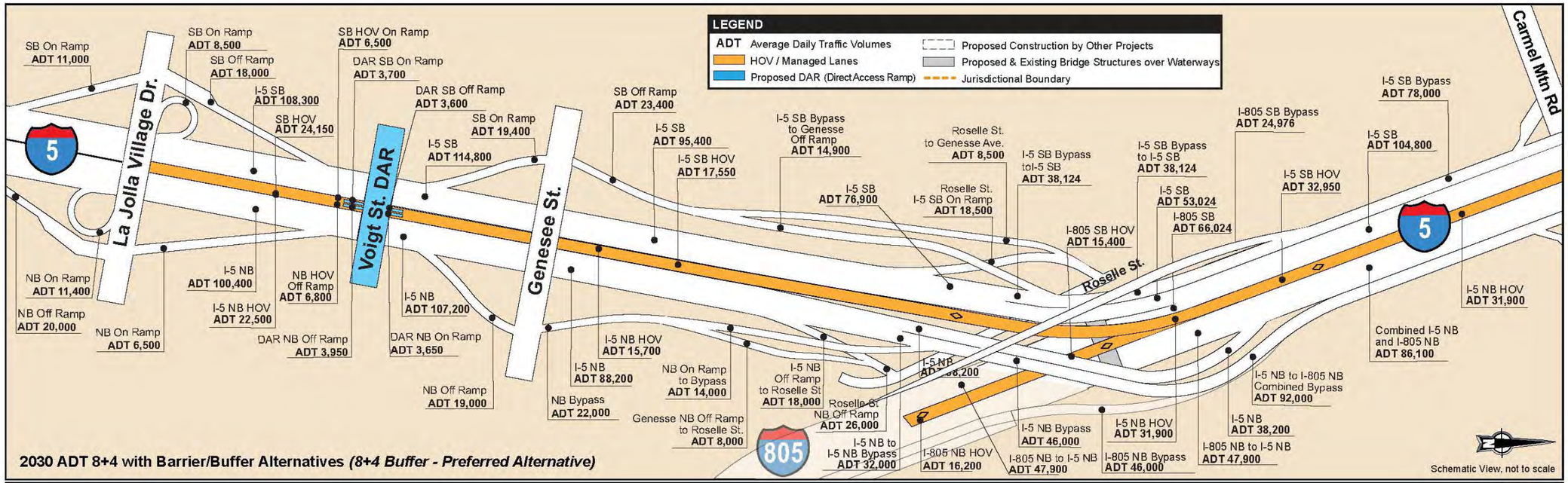
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

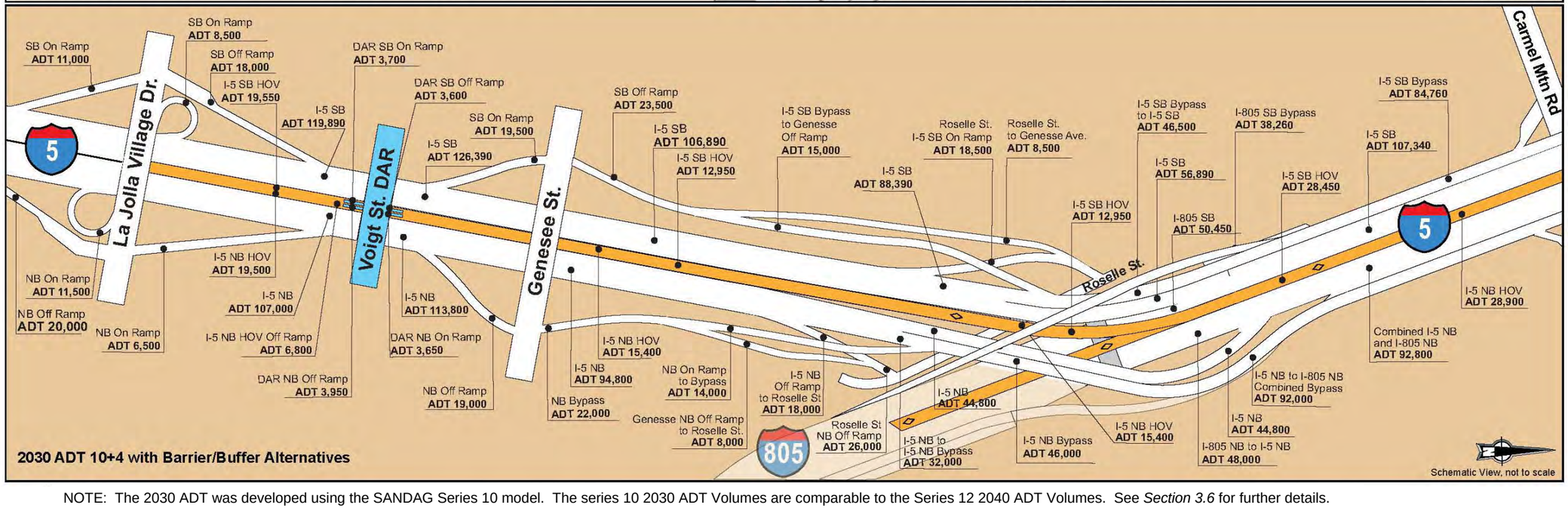
Figure 1-3.1e: Average Daily Traffic Volumes for 2006 Conditions and 2030 No Build Alternative



NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

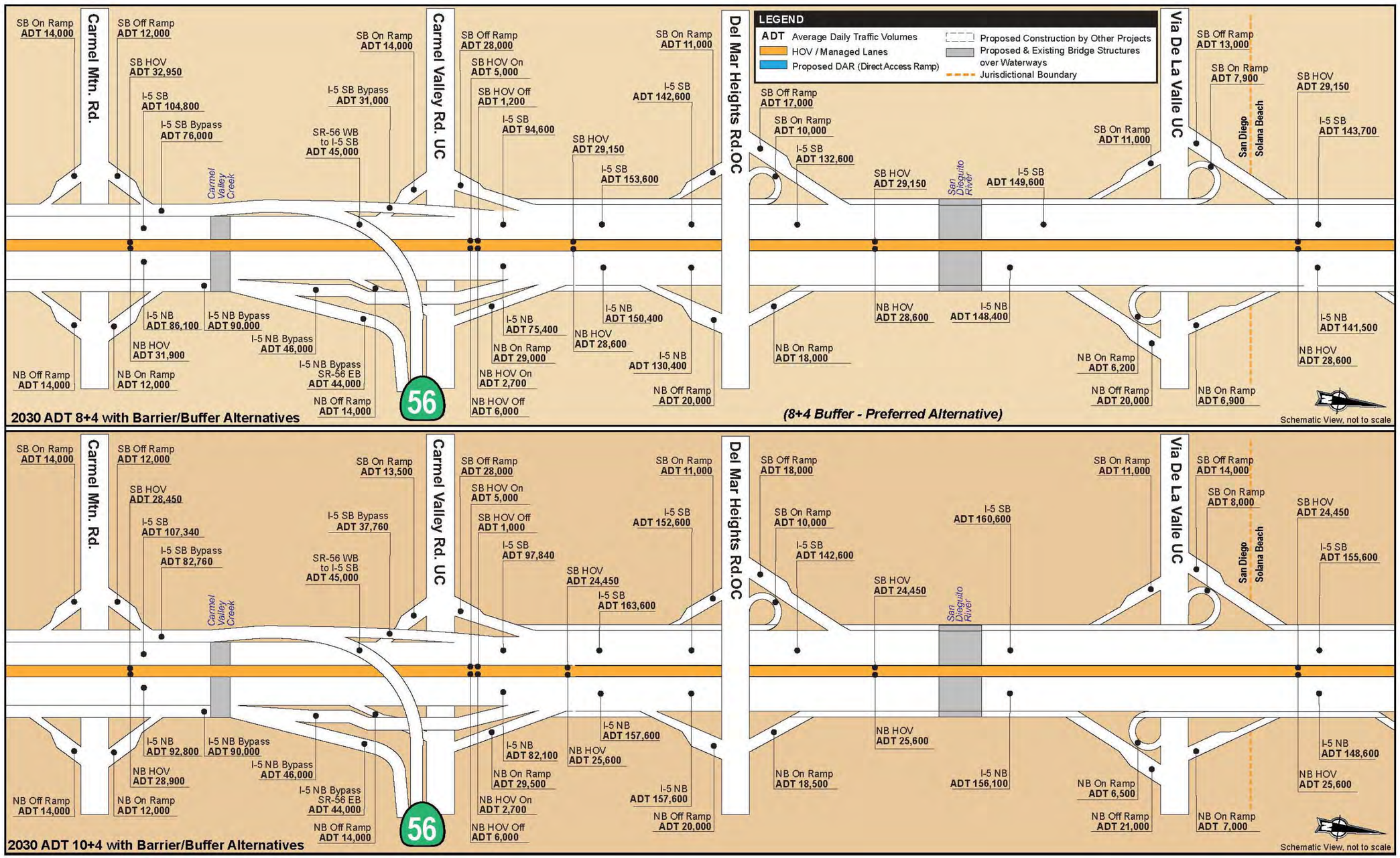
Figure 1-3.1f: Average Daily Traffic Volumes for 2006 Conditions and 2030 No Build Alternative





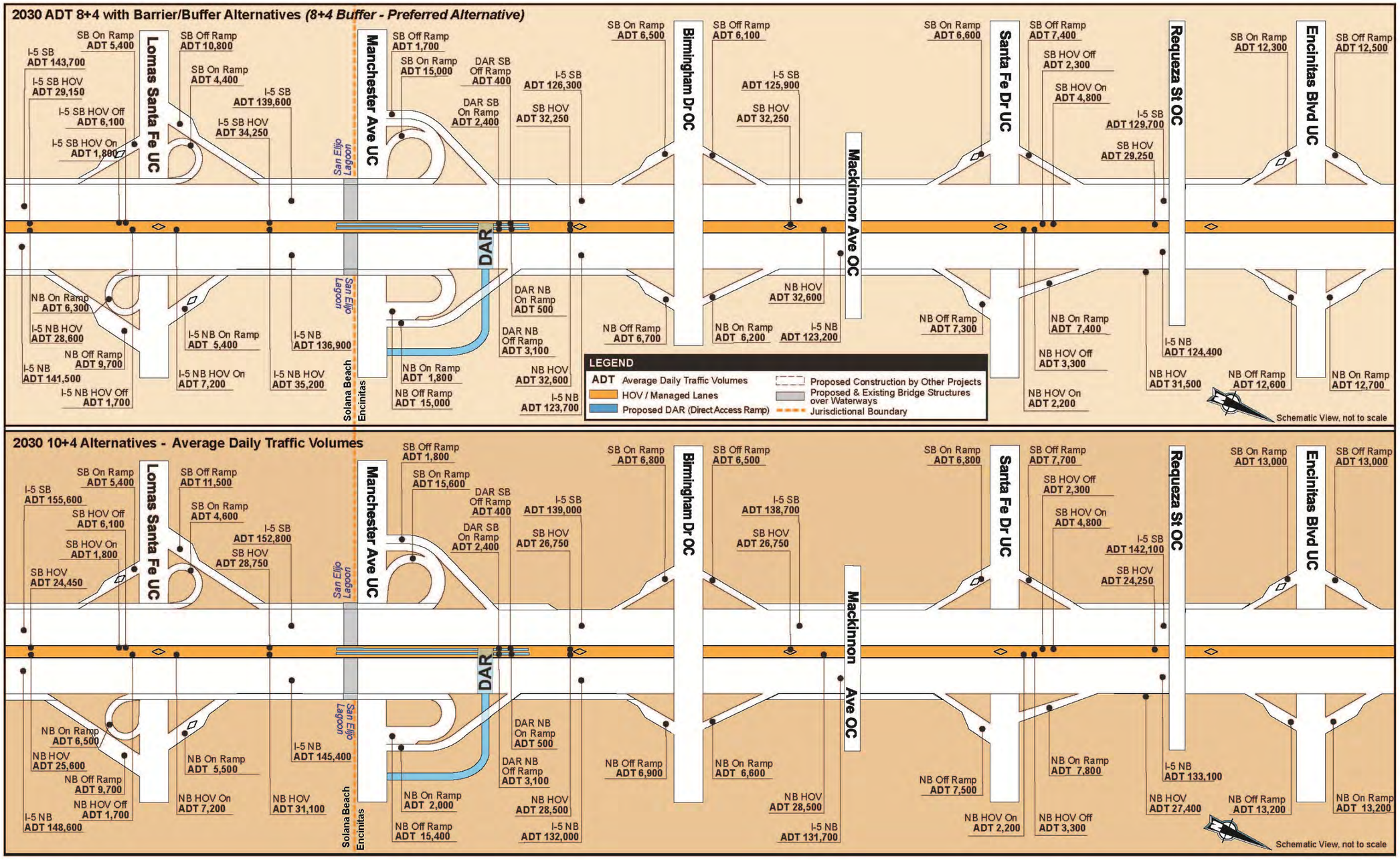
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.2a: Average Daily Traffic Volumes for 2030 8+4 Alternatives and 10+4 Alternatives



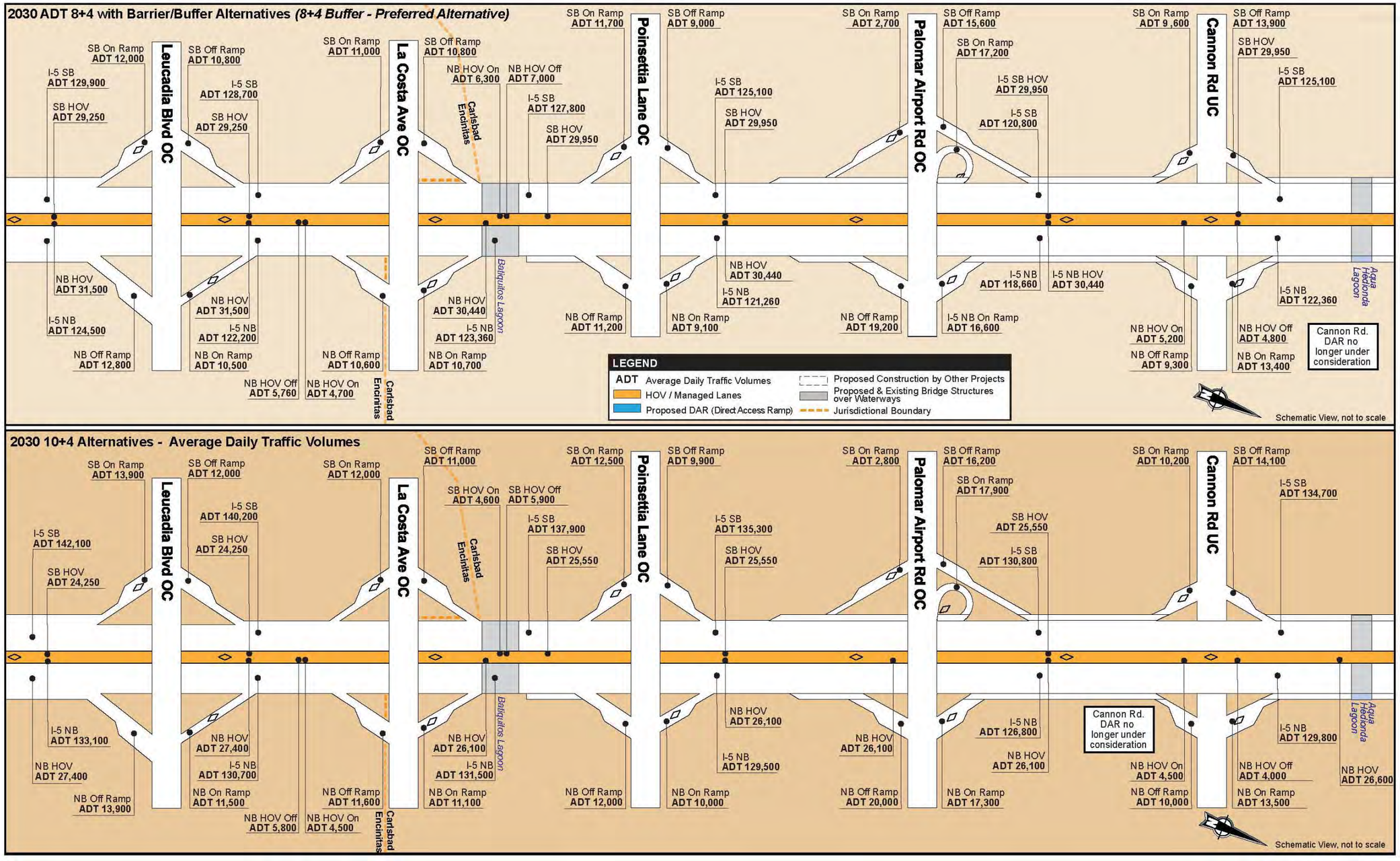
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.2b: Average Daily Traffic Volumes for 2030 8+4 Alternatives and 10+4 Alternatives



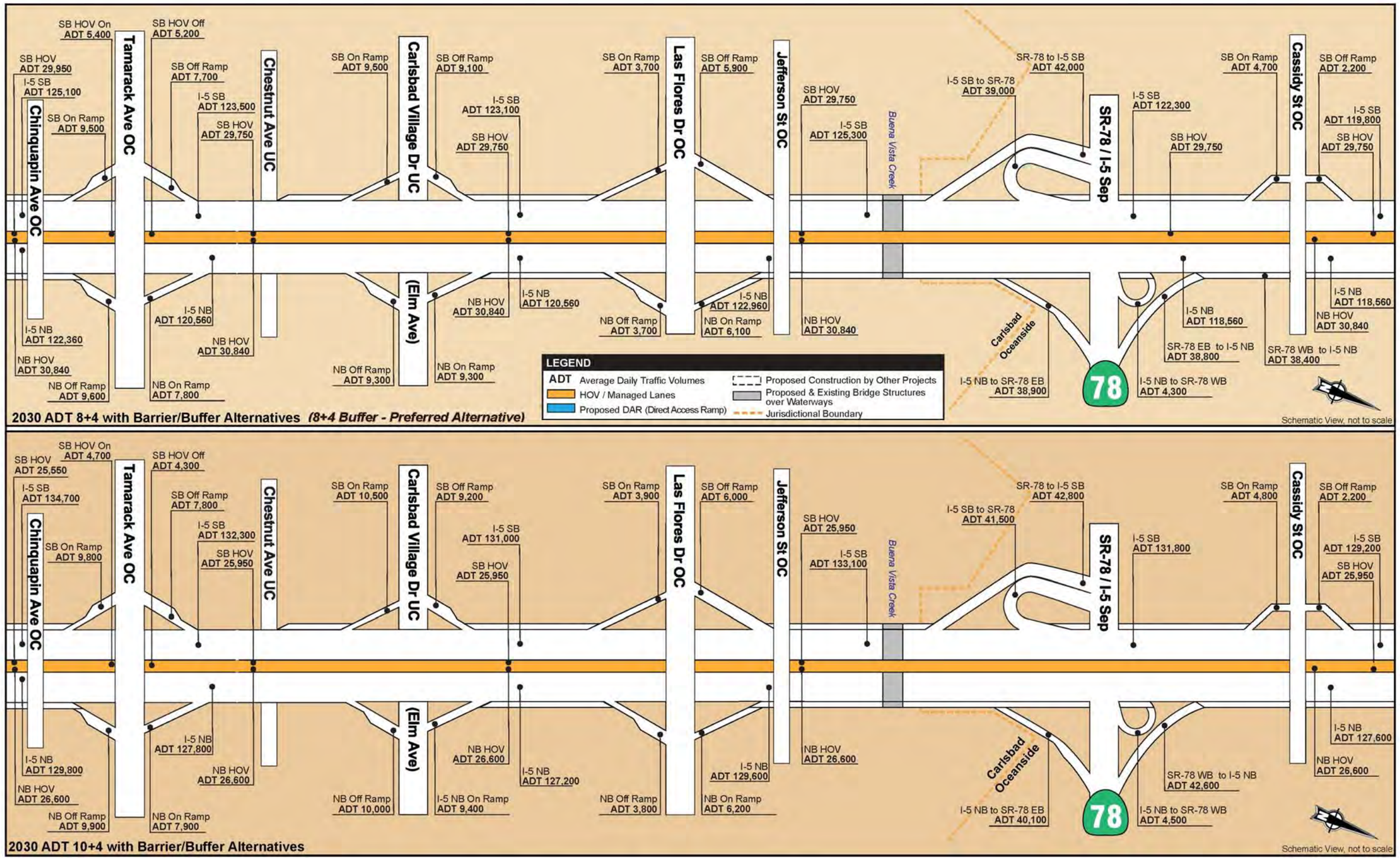
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.2c: Average Daily Traffic Volumes for 2030 8+4 Alternatives and 10+4 Alternatives



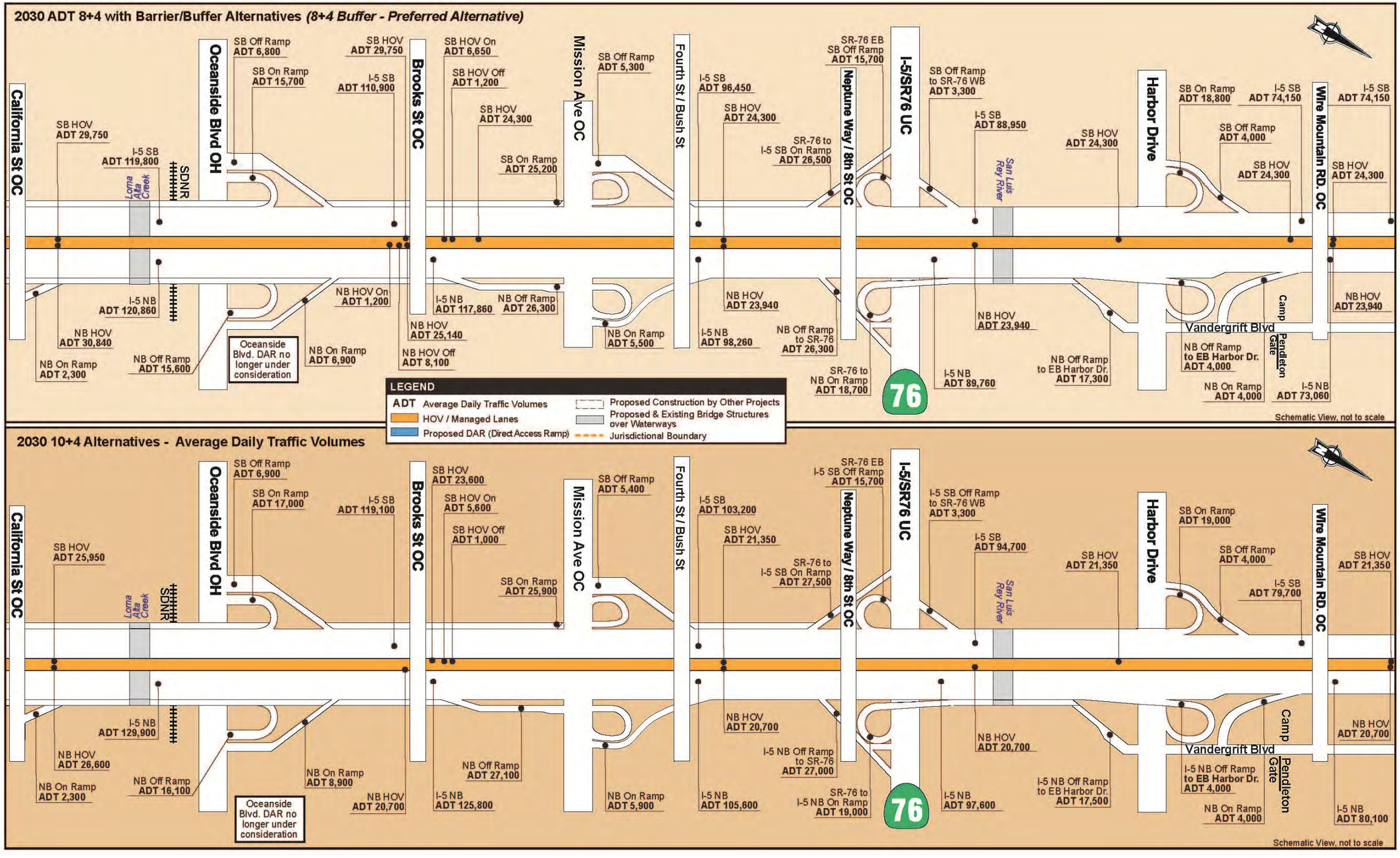
NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.2d: Average Daily Traffic Volumes for 2030 8+4 Alternatives and 10+4 Alternatives



NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.2e: Average Daily Traffic Volumes for 2030 8+4 Alternatives and 10+4 Alternatives



NOTE: The 2030 ADT was developed using the SANDAG Series 10 model. The series 10 2030 ADT Volumes are comparable to the Series 12 2040 ADT Volumes. See *Section 3.6* for further details.

Figure 1-3.2f: Average Daily Traffic Volumes for 2030 8+4 Alternatives and 10+4 Alternatives